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Determinants of Financial Inclusion in Africa: Is Institutional Quality Relevant?

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Abstract: Financial inclusion is seen as an enabler to growth in an economy, especially in developing regions like Africa. Despite the importance of financial inclusion, many factors play a role in one's decision to get involved in the financial sector. This paper therefore examined the determinants of financial inclusion in Africa, considering both demand and supply as well as infrastructure side factors using General Method of Moments (GMM) and the Ordinary Least Square (OLS) methods with data that spanned from 2004 to 2020. The study is a panel type that employed secondary data, that is sourced from the World Development Indicators, compiled by the World Bank. Twenty countries were purposively selected for the study based on data availability. The study revealed that GNI per capita, domestic credit to private sector and institution quality are significant determinants of financial inclusion in Africa. It was further revealed that GNI per capita, money supply and institutional quality contribute to the minimization of barriers to financial inclusion in the continent. This work is unique in the sense that it revealed the determinants of financial inclusion, using demand, supply and infrastructural

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PUBLIC INTEREST STATEMENT

Access to finance has been identified as the panacea in empowering households in order to win the fight against poverty, especially in a poverty-rife area like Africa. Many factors both country-wide and across countries influence one's decision to patronize financial services. It is important to holistically interrogate these factors from many perspectives due to the multifaceted nature of the financial inclusion concept. Despite efforts made by nations and development partners to enrol everyone into the financial sector, many barriers still serve as impediments to accessing financial services. In view of these concerns, among others, this study investigates the determinants of financial inclusion in Africa, considering demand, supply as well as infrastructure side factors. The study also looks at the factors that influence barriers to financial services utilization in the region. The study in a single model demonstrated that demand, supply as well as infrastructure factors, all determine inclusion of households and firms into the financial sector as well as revealed some factors that influence barriers to financial inclusion. Relative to the findings, the study professed some policy recommendations aimed at improving financial inclusion in Africa.

factors in a single model, which is different from previous studies that examined the determinants using either demand only or supply only or both but not including infrastructural factors. Governments in the selected countries as well as development partners should therefore institute policies that would improve on financial inclusion, through the strengthening of institution, as well as take pragmatic measures to minimize barriers to financial inclusion in Africa.

Subjects: Macroeconomics; Microeconomics; Development Economics

Keywords: Financial inclusion; Demand-side factors; Supply-side factors; Institutional quality; Financial barriers; Africa

1. Introduction

At the global level, financial inclusion is seen as one of the most talked-about system that can help improve the living standards of the people. According to the World Bank, financial inclusion has to do with households and firms having access to financial services that meet their needs, that they can afford, which is offered in a way that is responsible and sustainable (WB, 2022). That is, financial inclusion is where households and firms have access to financial services such as savings, payments, credit and insurance, which is accessible and affordable.

Inequality and unemployment coupled with its attendant low income is eminent in Africa. Financial inclusion is considered globally as an enabler to employment creation, increase in investments, improvement in income generation and eventually lead to a reduction in poverty. If the financial sector is developed, with unfettered access to financial services, it enhances the livelihoods of the people, boost economic development and as such leads to reduction in poverty (WBG, 2022).

It is estimated that with access to finance, Africa which is one of the poorest continents in the world, would be able to get to its development pedestal (Musau et al., 2018). Furthermore, financial inclusion is considered as an important instrument that can boost financial development, stimulate economic growth, deals with the problem of inequality in all its forms and most importantly, improve upon the poverty status of households (Demiguc-kunt et al., 2018; Chibba, 2009). Camara and Tuesta (2018) indicated that financial inclusion has both direct and indirect ways through which one could benefit; having access to cash for the day-to-day transactional needs of households and subsequently leads to smoothening of consumption and the ability to withstand destructions in the economy.

It is empirically proven by Mhlanga and Denhere (2020) who stated that finance is so important to the extent that the least amount of financial access provides the user an opportunity to withstand any financial shocks. Despite the importance of financial inclusion and the acceptance of the concept globally, there are factors both locally and globally that inhibit one's involvement in the financial sector. Wokabi and Fatoki (2019) investigated the determinants of financial inclusion in the east African countries, comprising Uganda, Tanzania, Kenya, Burundi and Rwanda, which revealed that income level and rural inhabitation are significant factors that influence an individual to participate in the financial sector. Mhlanga and Dunga (2020) and Prymostka et al. (2020) investigated the determinants of financial inclusion in Zimbabwe and Ukraine, respectively. Both studies revealed that income, financial literacy, educational level, distance, age of head of household, lack of trust in the financial institutions and unfavorable policies of the financial institutions are some of the factors that prevent one from getting involved in the financial sector. It is estimated that a well-coordinated financial system encourages the creation of new businesses and the growth of existing ones, which will go a long way to strengthen participants in the financial sector, including women and the youth who face socio-cultural/religious impediments in

getting involved in the financial space, since this category of households are most affected when they are financially excluded (Demirgnt-Kunt and Levine, 2008; Handriks, 2019; Siddik, 2017).

International or regional agencies like the International Bank for Reconstruction and Development (IBRD), African Development Bank and the G20 leaders have demonstrated their willingness in getting everyone enrolled in the financial system, especially women, by removing the necessary barriers in order to improve investments and reduce gender disparity (Aguera, 2015). It is important to improve on the factors that impede one's access to financial services due to poverty, unemployment, job losses, low income, high cost of funds, proximity to a financial service provider, unfavorable economic conditions, mistrust of financial institutions and their products, coupled with religious and socio-cultural impediments. These reasons, among others, even affect those who operate accounts to the extent that their accounts remain inactive. The global Findex database indicates that 25 percent of accounts held in developing countries have not been active or remained dormant in terms of deposit or withdrawal for the past one year (Bull, 2017). It is imperative to identify factors that leads to this non usage of accounts and avoidance of the financial system, and what promotes one's involvement in the financial sector since the consequences of involuntary exclusion is detrimental to the growth and poverty reduction of such persons.

Achugamonu et al. (2020) mention that about 80%, representing 325 million adults, in sub-Saharan Africa are unbanked due to varied unfavorable factors. It is therefore essential to reduce or eliminate these factors that prevent one from participating in the financial sector. This study therefore empirically identifies factors that determine one's involvement in the financial system in Africa which will inform policy makers in designing measures that will promote the financial inclusiveness thrive efforts to eliminate the barriers. Institutional involvement (endogenous and/or exogenous) plays an indispensable role in the financial sector in promoting trust the public repose in financial institutions in encouraging financial inclusiveness. Nkoa and Song (2020) indicated that Africa harbors fragile institutions which makes the fight against, for instance, poverty and inequality difficult. Chu et al. (2019) posits that institutional quality enhances the inclusion of households into the financial sector.

The specific role of institutions in promoting financial inclusiveness has been established in the extant works (Ajide et al., 2020; Eldomiaty et al., 2020; P. Muriu, 2020; Nguyen & Ha, 2021). It therefore suggests that the nature of institutions mediating the financial products transfer to households and firms cannot be underestimated. Institutional quality (infrastructural-side factors), despite its significance in promoting financial inclusion jointly with demand and supply sided factors, has not been extensively explored in the literature, i.e., determining the demand, supply and infrastructural factors simultaneously in a single study. Factors that influence barriers to utilization of financial services in Africa was also investigated in this study, which was not adequately investigated in the African literature. This consequently presents a knowledge gap with respect to the reasons that influence financial inclusion in the continent and hence legitimizes this study of determining how demand, supply and infrastructural-side factors would in a single model, influence the inclusion of households in Africa into the financial landscape and to determine contributing factors that inhibits one's access to financial services. This will therefore provide some knowledge on a comprehensive way to determine what influences one's decision to be involved in the financial system in Africa and what prevents one from participating in the financial sector, which is an improvement in the existing literature.

2. Review of Theoretical and Empirical Literature

The concept of financial inclusion as well as factors that determines inclusiveness rests on economic theories.

2.1. Theoretical Literature

According to the Financial Intermediation Theory, financial institutions play a major role in holding cash for the surplus public and channel same to the deficit market participants, through the concept of intermediation. Financial intermediation, simply put, is the process by which financial institutions (deposit money banks, insurance companies, investment banks, pension funds and banking agents, among others) mediates between providers of cash and users of financial capital by transferring money from those who have excess funds to those who need them in a financial market (Kwakye, 2012). Financial intermediaries overcome the problem of information asymmetry by playing the role as delegated monitors (Diamond, 1984) and distribution of information to market players (Leland & Pyle, 1977). Transaction cost is also critical in the concept of financial intermediation, which is the cost incurred by market participants in their dealings in the financial sector (Fama, 1980). Financial intermediation can substantially reduce the cost savers and borrowers incur in financial transactions, involving time and money spent during exchange of goods and services (Levine, 1997). Financial intermediaries have control over cost because they are large and have the expertise and as such have an advantage of economies of scale, as compared to individual households. Financial intermediaries are also able to effectively reduce the risk that investors bare on their investments by sharing the risk between all market players. This encourages households and/firms to participate in the financial sector and hence promote financial inclusion.

Institutions play a critical role in facilitating the transfer of the benefits of financial products to households and firms. The neo-institutional theory, propounded by Douglass North, states that for systems in an economy to function effectively, it depends on how quality the institutions in the system operate (North, 1990). According to the theory, institutions consist of constraints in the political, economic and social coexistence that are fuelled by the human component. This can be both formal (laws, constitution, property and human rights) and informal (customs, taboos, traditions and code of conduct). Institutional quality can be considered as inclusive or extractive; extractive institutional setting has to do with few powerful individuals exercising political power and inclusive institutional system has to do with evenly usage of political power (Acemoglu & Robinson, 2012). If the various structures within the economy functions well as spelt out in the institutional quality indicators, it promotes confidence in the financial sector and as such lead to more people participating in the sector and hence promotes inclusion.

2.2. Empirical literature

Demand-sided obstacles and supply related constraints, coupled with institutional factors, play an important role in championing the cause of financial inclusion.

2.2.1. Demand-sided factors that influence financial inclusion

It is critical to ascertain how demand-sided factors contribute to financial inclusion. This deals with assessing the literature on determinants of financial inclusion from the view point of users of financial services.

Dar and Ahmed (2020) examined the drivers of financial inclusion and the determinants of obstacles to financial inclusion in India. With the help of the probit model, the study revealed that gender, education, age and income level are significant contributing factors in one's involvement in the financial sector. In a related study, Badar et al. (2020) explored the determinants of financial inclusion in India, Pakistan and Bangladesh. With the use of a multinomial logistic regression the study shows that being male, educated, employed and rich as well as owning a mobile phone makes one likely to use financial products in the selected countries.

Mhlanga and Denhere (2020) investigated what determines one's involvement in the financial sector in the southern African region, with south Africa as a case study. With the use of the logit model, race, income, marital status and gender were found to be the major drivers of financial inclusion in the sub region. Financial inclusion plays a role in financial freedom and financial

capability. Tinta et al. (2022) studied the micro-level factors that encourage financial inclusion and financial resilience in Africa. It was revealed that for one to open a formal account or mobile money account, it is dependent on individual characteristics, financial literacy and stringent or otherwise of the requirement to the account opening. The study further revealed that women, youth and rural residents are associated with informal savings whilst the men, urban residents and the elderly are associated with formal savings with the usage of formal savings linked to highly educated and high-income households. Furthermore, marriage, innovation and financial literacy were identified to promote financial resilience. Bekele (2022) comparatively analysed the determinants of financial inclusion in Kenya and Ethiopia with macro- and micro-levels in perspective. Using the Generalized linear model, the study revealed that gender, age, employment status and ownership of a mobile phone significantly influence financial inclusion. Ndanshau and Njau (2021) empirically examined demand-side factors that influence financial inclusion in Tanzania. Employing the probit model, the study found that being male, middle aged, gainfully employed, residing in an urban area, having multiple streams of income and highly educated persons are more likely to be included in the financial sector in Tanzania. Amoah et al. (2020) examine what influences one's choice of using mobile money in the greater Accra region of Ghana. It is imperative to note that psychological and socio-cultural factors influence the use of financial services. Using a logit model, the study revealed that educational level and income constitute the main factors that influence mobile money usage in Ghana. Ndoya and Tsala (2021) investigated the effect of gender in promoting financial inclusion in Cameron. With access and usage variables, the study found that there is a gender gap in the access and usage of financial products in favour of men, since men are mostly more resourced than women, with the largest contributor being income. With regard to financial services provision, education was seen as the major contributing factor. Financial inclusion has been identified as one of the enablers in fighting poverty in Namibia. Iyambo (2020) investigated the determinants of financial inclusion in the Khomas and Oshana regions in Namibia. Using a binary logistics regression model, the study found that income level, operating a bank account, educational attainment, savings ability, age, credit and distance are the key determinants of financial inclusion in Namibia.

Senon and Manda (2022) investigated how access to funding impacts on the ability of the youth to be entrepreneur in Benin. With increase in the youth population, coupled with increasing unemployment in developing countries, it is important to make funds available to the youth to create their own businesses by removing any barriers to the sourcing of funds. Using the endogenous switching regression technique, together with propensity score matching, the study revealed that age, poverty level, education, experience and presence of a bank branch influence the youth's access to finance in Benin. The study further shows that there is a 15.2% likelihood that a youth with access to funds will lead the youth into entrepreneurship. In a similar vein, Koloma (2021) examined the willingness of the youth to go into business in relation to their level of financial inclusiveness. With the use of logit model and the propensity score matching, it was revealed that for a youth to be more included in the financial sector, it depends on how educated the person is, their employment status, family status and at least a family member having an account. The cost of accessing financial services, perceptions associated with financial services and low income also contribute to entrepreneurial development. Savings and loans were also identified to play a major role in the wiliness of the youth to venture into entrepreneurship. The study specifically showed that when the youth is offered a loan, it is more likely for them to go into agribusiness.

2.2.2. Supply-sided factors that influence financial inclusion

For users to access financial services and derive the benefits therein, it depends on the providers of such services. This section presents empirical literature on factors that determine financial inclusion on the point of view of financial institutions that provide financial services to households and firms.

Stakic et al. (2021) investigated the key determinants of financial inclusion in the Western Balkan countries (Albania, Bosnia & Herzegovina, Kosovo, Montenegro, North Macedonia and Serbia). With the use of a pool panel data regression model, the study revealed that economic growth, internet usage and mobile phone ownership and usage are positively and significantly related to financial inclusion in the countries. The study however revealed a negative relationship between interest rate and financial inclusion. This therefore suggests that economic growth, internet usage, mobile phone usage and interest rates are determinants of financial inclusion in the Western Balkan countries. In a related study, Eze and Dumani (2020) investigated the determinants of financial inclusion in Nigeria from 2000 to 2018. With the use of OLS technique, the study revealed that commercial bank branches and deposit interest rates are negativity related to financial inclusion whilst domestic credit to private sector (% GDP), lending interest rate and ratio of rural deposits to loans are directly related to financial inclusion.

Financial inclusion has country specific determinants as well as worldwide reasons that influence one's involvement in the sector, in terms of the financial institutions delivering the financial service. Mose and Thomi (2021) explored the supply side determinants of financial inclusion due to its ability to complement efforts put up by government and financial institutions in making available financial services for use by households and firms. Using the OLS method, the study found that the number of internet usage and economic growth have a significant effect on the patronage of households and firms in the financial sector. Chinoda and Kwenda (2019) investigated the impact of mobile phones, economic growth, bank competition and stability on financial inclusion. With data from 49 countries from 2004 to 2016, the study was analysed using a five-variable panel structural vector autoregressive model. It was revealed that financial inclusion is significantly and positively related to shocks emanating from banking competition, mobile phones, economic growth and bank stability.

Adil and Jahil (2020) studied the supply side determinants of financial inclusion in the banking sector of Pakistan. Employing an autoregressive distribution lag method, the study found that for the banking sector of Pakistan to have a greater impact, it is dependent on geographics, the size and demographic representation of the bank. The study further opined that increase in consumer credit and small-sized advances can also promote financial inclusion. Kandari et al. (2021) explored the determinants of financial inclusion in India from socio-economic and demographic perspective. With data from 780 rural households using binary logistic regression model, the study revealed that bank account ownership, availability of credit facilities and mobile banking access were seen to be the main predictors of financial inclusion in rural India. Oyelami et al. (2017) examined determinants of financial inclusion in sub-Saharan Africa. With the use of panel autoregressive distributive lag (ARDL) method, the study revealed that financial inclusion is significantly influenced by interest rates and bank innovation which is proxied with ATM usage. Mossie (2022) examined the factors that influence financial inclusion among adults in Ethiopia. With the use of the logit model, the study found that distance to financial access point, documentation requirements and affordability were the supply side factors that influence financial inclusion in Ethiopia. In a related study, Eze and Dumani (2020) investigated determinants of financial inclusion in Nigeria. Supply side data from the World Development Indicators (WDI) spanning from 2000 to 2018 was employed. With the use of OLS technique, the study revealed that commercial bank branches and deposit interest rates are negativity related to financial inclusion whilst domestic credit to private sector (% GDP), lending interest rate and ratio of rural deposits to loans are directly related to financial inclusion. Abel et al. (2018) reviewed determinants of financial inclusion in Zimbabwe using the logit model. The study revealed that documentary requirements to open an account with a financial institution and distance to the nearest financial outlet play a role in one's involvement in the financial sector in Zimbabwe.

2.2.3. Infrastructural factors that influence financial inclusion

In addition to financial services and the usage of same, quality of institutions operating within the economy also plays an important role in promoting the trust households and firms have on the products and services of financial institutions.

The contribution of institutional quality in promoting financial inclusion cannot be underestimated. P.W. Muriu (2021) explored whether institutional quality matters for financial inclusion, using deposit account ownership as a benchmark. With annual data covering 120 countries, both developed and emerging countries, covering a period of 2004–2019, analysed using the fixed effects panel estimation model, revealed that regulatory quality and rule of law contributes immensely towards inclusive finance, especially in Africa, where their legal and regulatory institutions are not quite strong.

In a related study, Aracil et al. (2021) interrogated the role institutional quality plays in financial inclusion in facilitating the poverty reduction fight using 75 developing and developed countries over the period 2004–2017. Using the quintile regression analysis method, it was found that the quality of institutions quickens the importance of inclusive finance on poverty reduction. The work emphasizes that this positive effect institutional quality has on poverty reduction is more prominent in developing countries than advanced countries.

2.3. Conceptual framework of the study

The literature extensively discussed the determinants of financial inclusion in the world, including Africa. The extant literature basically examined demand and/or supply side factors that determine one's inclusion in the financial sector. This study therefore includes infrastructural side factors (institutional quality) that influence financial inclusion in Africa. It has become necessary to include this variable due to the impact of institutional quality in promoting inclusive finance due to its ability to promote trust and confidence of households and firms in the financial sector. This is diagrammatically represented in Figure 1.

3. Methodology

3.1. Data

The study is quantitative research that uses data generated from secondary sources. The panel data span from 2004 to 2020, which period was chosen as a result of data availability. It must be indicated that the measurement of the data as compiled by the data sources measured up to 2020 as at 2022 when the study was conducted. The starting year was chosen because the

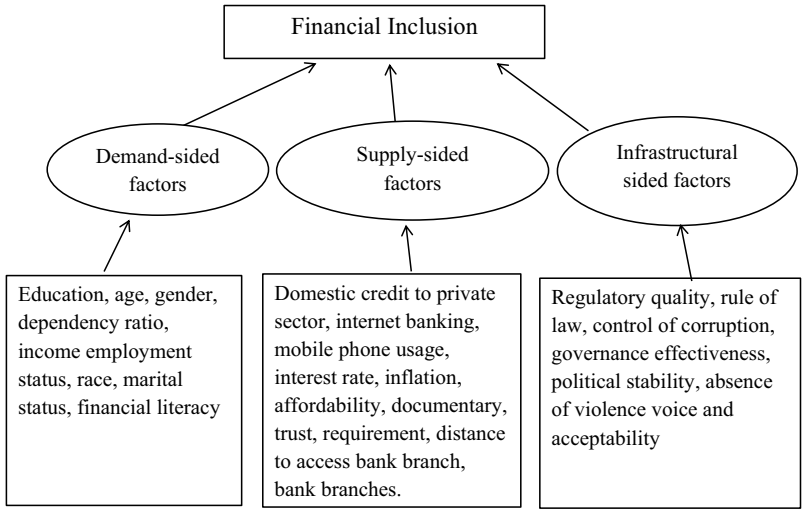

Figure 1. Conceptual framework of determinants of financial inclusion.

Source: Author's own construct, 2022

measurement of most of the variables used in the study started in 2004, especially those used in the measurement of the financial inclusion variable; this necessitates the choice of the study period. Data covering the following variables: number of Automated Teller Machines (ATM) per 100,000 adult population, branches of banks and agents per 100,000 population, having a savings account, having at least one financial product and holding a loan account in a financial organization, which was generated from the World Development Indicators (WDI) database, would be used to construct the financial inclusion index. For the barriers of financial services, a cross-sectional data on the following variables were used; distance, trust, affordability and documentation, which were generated from the Financial Access survey (FAS) compiled by the International Monetary Fund (IMF). The cross-sectional approach was adopted since the data on the barriers' indicators are compiled every 3 years. The year 2017 was therefore arbitrarily chosen for the study to explore factors that influence barriers to financial services utilization. Due to data availability, the paper used 20 African countries (Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo DR, Egypt, Ghana, Lesotho, Madagascar, Namibia, Nigeria, Rwanda, Sierra Leone, South Sudan, Tanzania, Togo, Uganda and Mozambique).

For financial inclusion, dimensions such as number of Automated Teller Machines (ATM) per 100,000 adult population, branches of banks and agents per 100,000 population, having a savings account, having at least one financial product and holding a loan account in a financial organization would be employed, comprising access and usage dimensions. For the barriers, trust, distance, affordability and document dimensions were used. To generate a robust financial inclusion index from both the panel (financial access and usage) and cross-sectional (financial barriers) datasets, the Principal Component Analysis (PCA) techniques was used, following Camara and Tuesta (2018).

Institutional quality (extractive or inclusive) has an effect on economic growth. For the purpose of this study, the six indicators that were used as a measure of institutional quality are Rule of law, Control of Corruption, Regulatory Quality, Governance Effectiveness, Political Stability and Absence of Violence/Terrorism and Voice and Accountability (World Bank, 2010). According to Kaufmann et al. (2010) these indicators cover aspects that fully show how institutions function effectively in a country, as suggested by the neo-institutional theory of North (1990). Institutional quality is therefore expected to promote financial inclusion.

Economic growth is a significant macroeconomic term that is measured by the yearly rate of gross domestic product (GDP), which is determined by the market prices by the use of a continual local currency, whose aggregates are benchmarked on a constant 2010 US dollars. Economic growth is expected to improve the economic life of households, which will encourage them to patronize financial products. Economic growth, all things been equal, is expected to ensure an increase in financial inclusion (World Bank, 2005; Adams, 2002).

Inflation is defined as the persistent rise in the price of goods and services over time. It is derived using the consumer price index, which indicates the average cost of a basket of goods and services in percentage terms over time at predefined intervals. The level of inflation has a detrimental influence on the income of poor people, which changes over time. Less income means that households would not be able to access financial services. Ndoricimpa (2017) argues that low levels of inflation enhance growth and high level is detrimental to economic growth, especially in low- and middle-income countries. Low level of inflation is therefore expected to improve upon the level of financial inclusion due to its ability to increase disposable income of households.

Dependency ratio is referred to as the share of dependents in the populace, relative to the number of the active work force. The World Bank defines dependency ratio as the proportion of senior citizens (65+) to working-age citizens (15–64) multiplied by a hundred. Theoretical research backs up the claim that a larger dependency ratio leads to a lower savings rate. The dependency ratio is expected to reveal a negative relationship with financial inclusion since the less dependants one has, the more income to participate in the financial sector.

Education is regarded as a crucial instrument in the fight against poverty since poverty and education are inversely related; a higher level of education decreases the number of destitute individuals due to the information learned and the effect on higher pay (Awan et al., 2011). Educational background is expressed as a ratio of gross secondary school enrolment and the total population, regardless of the age. When one is educated, it is expected that he/she knows the importance of finance as such will participate in the financial sector through savings, investment and acquisition of loans. It is therefore expected that improvement in the level of education will have a positive relationship with financial inclusion.

Domestic credit to the private sector refers to the provision of financial resources like loans, trade credits, purchases of nonequity securities, account receivables that establishes claim for payments, that are advanced to the private sector by financial institutions (monetary authorities, deposit money banks, microfinance institutions as well as cooperatives). The private sector is regarded as an engine of growth in an economy, especially developing economies like Africa, due to their role in income/revenue generation through creation of employment and payment of taxes. The generation of income through the growth in business and employment created would encourage the beneficiaries to participate in the financial sector. Leitão (2012) indicates that domestic credit provided by banks has a stimulative effect in ensuring the evolution of GDP as well as economic growth due to its ability to create income. Enhancement in income will therefore lead to improvement in engagement with the financial sector.

Gross National Income (GNI) per capita is the sum of value added by all resident producers together with any product tax that is not included in the valuation of output in addition to net receipts of primary income from abroad. It is used to measure the wealth of every country from year to year. As GNI grows, it means that, all things being equal, incomes of the citizenry grow, which is a function of one's ability to patronize the financial product. Menyelim et al. (2021) revealed that there is a negative effect of financial access on the role income per capita plays in economic growth.

Trade Openness according to the Comparative Advantage theory and the Heckscher–Ohlin theory, states that if a country wants to trade with another, that country shall produce in large quantities, commodities which it has relative advantage in. According to the World Trade Organization (2018), trade among and within nations is a key enabler to growth in the world and reduction in poverty, since there is evidence that an open economy has opened greater opportunities for millions of people worldwide, which has led to a reduction in extreme poverty. Growth in trade openness means improvement in income levels, which encourages households to engage with the financial sector. It is measured as the total of exports and imports of goods and services, which is expressed as a percentage of GDP.

Government expenditure is premised on two school of thoughts that economists share when it comes to the effects of government expenditure on economic growth. The neo-classical economists ague that government investment increases public debt and interest rates, through the crowding-out effect, which has the potential to limit the role of the private sector in the economy and as such lowers output. The Keynesian economists, on the other hand, support the argument that through the multiplier effect theory, government expenditure has a propelling effect in an economy, both in terms of infrastructure financing and/transfers. Notwithstanding, it is theoretically expected that government spending through transfers and grants has the potential to raise the disposable income of households, which will inspire them to use financial products. It is measured as government's final consumption expenditure/transfers as a percentage of GDP.

Money supply is the total amount of money in circulation in a particular economy. It is determined by the fraction of broad money, which is the total amount of money held outside of banks and demand deposits, excluding government bonds. In addition to the central government, money supply comprises indigenes' savings, foreign currency deposits and time. If money supply in the

economy increases, it means that there is more money being used in the economy. Due to the increasing consumer power to purchase, an increase in the money supply directly leads to improved consumption expenditure on goods and services. This will ensure improvement in the rate of employment as a result of the need to produce more in order to meet demand. Economically, it is expected that an increase in money supply will influence growth due to its ability to increase investment (Galadima and Ngada (2017). Increase in money supply and its tendency to affect interest rates means that households will have access to cheaper credit and as such encourage them to engage banks for credit and hence get included in the financial sector.

3.2. Estimation strategy

The paper employed two separate econometric representations to estimate the variables, labelled model 1 and model 2. Model 1 employs the Generalized Method of Moment (GMM) model to investigate determinants of financial inclusion in Africa. In Model 2, since the data used for the barriers of financial inclusion is cross-sectional in nature, the Ordinary Least Square (OLS) method was used to determine factors that influence the barriers to financial services utilization in Africa.

The determinants are categorized under demand (dependency ratio, gross national income per capita, education and inflation), supply (domestic credit to private sector), infrastructural (representing the institutional quality indicators, as mentioned earlier) and other control variables.

The variables for the study are carefully selected due to their impact in eliminating income inequality, which is the main determining factor in households' participation in the financial sector.

To estimate the model 1, we followed the Demirguc-Kunt et al. (2014), Honohan (2008) and Zhaung (2017), and to estimate model 2, we followed Chikalipah (2017) for the estimation.

Model 1

$$Fii_{it} = Fii_{it-1} + \beta_0 + \beta_1 DCPS_{it} + \beta_2 DPR_{it} + \beta_3 GNI\ per\ capita_{it} + \beta_4 EDU_{it} + \beta_5 INFRA_{it}(IQI) + \beta_6 Y_{it} + \beta_7 INF_{it} + \varepsilon_{it} \quad (1)$$

Model 2

$$BARFI_i = \alpha_0 + \alpha_1 DCPS_i + \alpha_2 GNI_i + \alpha_3 EDU_i + \alpha_4 GOVEXP_i + \alpha_5 TO_i + \alpha_6 MS_i + \alpha_7 IQI_i + \varepsilon_1 \quad (2)$$

Where Fii_{it}, $BARFI_i, Fii_{it-1}, \mathrm{DCPS}_{it}, \mathrm{DPR}_{it}, \mathrm{GNI}_{it}, \mathrm{EDU}_{it}, \mathrm{INFRA}_{it}(IQI), \mathrm{Y}_{it}, \mathrm{INF}_{it}, GOVEXP_i, TO_i$ and MS_i represents financial inclusion, barriers to financial inclusion, financial inclusion lag, domestic credit provided to the private sector, dependency ratio, GNI per capita, education, infrastructural factors (institutional quality index), GDP growth and inflation, government expenditure, trade openness and money supply, respectively. Also, $u_{it}, \varepsilon_{it}, i, t$ represent fixed effect by country, error term, country index and time period index (years), respectively. α_0 and β_0 are the constants and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,\ \ \beta_6, \beta_7, \alpha_1, \alpha_2, \alpha_3,\ \ \alpha_4, \alpha_5, \alpha_6 and \alpha_7$ represent estimates of the parameters of the models estimated.

The PCA approach is robust since it overcomes the problem of assigning weights to the dimensions arbitrarily, as used by some authors (Parks and Mercado, 2015; Chakravarty and Pal, 2010; Sarma, 2008), due to the use of parametric method in assigning the weights. According to Lockwood (2004), assigning weights using the author's own discretion is challenging since a slight change can affect the entire results, legitimizing the use of the PCA.

The PCA method is illustrated below:

$$FI_i = w_1 Y_i^a + w_2 Y_i^u + e_i \quad (3)$$

Where i, Y_i^a and Y_i^u represent country, access and usage dimensions, respectively.

The dimensions are estimated separately by

$$Y_i^a = \alpha_1 ATM_{popi} + \alpha_2 branches_{popi} + u_i \tag{4}$$

$$Y_i^u = \beta_1 account_i + \beta_2 savings_i + \beta_3 loans_i + \epsilon_i \tag{5}$$

These equations representing the two dimensions would be estimated using principal components of the explanatory variables, with joint estimation of the unobserved endogenous variables α *and* β.

We define $R_p(pxp)$ as the correlation matrix of the P standardize indicators for each of the two dimensions. $\lambda_j(j = 1, 2 \ldots p)$ denote the $j - th$ eigenvalue, where J is the number of principal components, which also represents the number of indicators of P.

$\delta_j(px1)$ is the eigenvector of the correlation matrix. It is further assumed that $\lambda_1 > \lambda_2 > \ldots \lambda_p$, which represent $P_k(k = 1, 2 \ldots P)$ as the $k - th$ principal component.

The following weighted averages represent the estimator of each dimension

$$Y_i^a = \frac{\sum_{j,k=1}^{P} \lambda_j^a P_{ki}^a}{\sum_{j=1}^{P} \lambda_j^a} \tag{6}$$

$$Y_i^u = \frac{\sum_{j,k=1}^{P} \lambda_j^u P_{ki}^u}{\sum_{j=1}^{P} \lambda_j^u} \tag{7}$$

where

$P_k = X\lambda_j$; λ_j is the variance of the $k - th$ weight X is the indicator matrix.

We compute the overall financial inclusion index by combining all the separate indexes into (3) in order to estimate the parameter λ, i.e.

$$FI_i = \frac{\sum_{j=1}^{P} \lambda_j P_{ki}}{\sum_{j=1}^{P} \lambda_j} \tag{8}$$

Each component P_{ki} is written as a linear combination of the two dimensions and the respective eigenvectors of the correlation matrices is presented as follows

$$P_{1i} = \pi_{11} Y_i^a + \pi_{12} Y_i^u \tag{9}$$

$$P_{2i} = \pi_{21} Y_i^a + \pi_{22} Y_i^u \tag{10}$$

By substituting the P_{ki} as expressed in (9), (10) and into (11), we get the financial inclusion index.

$$FI_i = \frac{\sum_{j=1}^{2} \lambda_j \left(\pi_{j1} Y_i^a + \pi_{j2} Y_i^u\right)}{\sum_{j=1}^{2} \lambda_j} \tag{11}$$

Equation 3.11 can therefore be expressed linearly as the overall weighted average of financial inclusion index as represented in (12)

$$FI_i = w_1 Y_i^a + w_2 Y_i^u + e_i, \tag{12}$$

where

$w_k = \frac{\sum_{j=1}^{2} \lambda_j \pi_{jk}}{\sum_{j=1}^{2} \lambda_j}$; w_k is the relative weight of each dimension in the final financial inclusion index.

The PCA method was first of all used to estimate indexes for the various components that form the usage and access dimensions as contained in equations 4 and 5 before putting them together to determine the composite financial inclusion index, as presented above. The same process was followed in constructing the financial barriers and institutional quality indexes.

The financial inclusion index is then standardized to fall within 0 and 1 inclusive, indicating that as the index increases, it means the economy is more financially inclusive. According to Sarma (2008), all economies are categorized into three: 0.5 indicates highly inclusive economy, 0.3 indicates medium inclusive economy and 0 indicates low inclusive economy.

Furthermore, to obtain credible results, the study carried out a unit root test on the variables to ascertain its stationarity or otherwise. The paper employed the Levin–Lin–Chu unit root test, which null hypothesized non-stationarity as opposed to the alternative stationary hypothesis.

Autocorrelation of the residuals was also tested due to the presence of the lagged dependent variable that happens to be part of the independent variables, which is likely to cause correlation of the lagged term with the original variable. The residuals of the differenced equation in the GMM will create serial correlation. Nevertheless, the hypothesis that there is serial independence in the original errors meant that the differenced residuals would not be significantly an AR (2) process. To correct the problem of endogeneity, the GMM appears handy to correct it since the financial inclusion data are associated with endogeneity and also have the tendency to create a problem of heterogeneity. The GMM method is also robust is correcting any bias resulting from potential variables that was omitted, endogenous right-hand side and any error in the course of the measurement.

To correct the problem of heterogeneity in the results, the study first of all estimated the fixed and random effects models to ascertain which model gives the best estimates, where the selection is made based on the Hausman test.

To address the fixed effects, the dynamic panel GMM takes first-difference purposely to transform equation (1) as follows:

$$\begin{aligned} Fii_{it} = {} & y_1 \Delta Fii_{it-1} + y_1 \Delta DCPS_{it} + y_2 \Delta DPR_{it} + y_3 \Delta GNI\ per\ capita_{it} + y_4 \Delta EDU_{it} + y_5 \Delta INFRA_{it} \\ & + y_6 \Delta Y_{it} + y_7 \Delta INF_{it} + \Delta_{it}. \end{aligned} \tag{13}$$

The first difference is used to transform the regressors in order to remove the fixed effect as a result of the country-specifics since it does not change with time.

To estimate model (1), the difference-GMM type was used since the study comprises higher number of countries (20) relative to the number of years (17). This is justified by Mileva (2007) who mentioned that in such circumstances, the difference-GMM is ideal to the system-GMM and therefore legitimizes the choice of the difference GMM in this paper.

Also, the choice of the OLS technique to estimate model (2) is premised on the Gauss–Markov theorem, which avers that the least squares technique is the best linear unbiased estimator (BLUE) with which a straight-line trend equation could be estimated (Gujarati & Porter, 2009).

4. Results and Discussion

4.1. Descriptive Statistics

This section presents the descriptive analyses of all the variables estimated in this paper. The variables comprise financial inclusion, domestic credit to private sector, dependency ratio, GNI per capita, inflation rates, GDP growth, education, money supply, trade openness, government expenditure and institutional quality index and are presented in Tables 1 and 2. The variables in Table 1 deal with variables used to estimate the determinants of financial inclusion and those in Table 2 deal with factors that influence barriers to financial services utilization.

Financial inclusion index has an average of 0.18506 with a standard deviation of 0.15674, indicating a low level of inclusion in the selected countries in Africa within the seventeen-year period. The mean value of the domestic credit to private sector was found to be 16.05894 percent of GDP and a standard deviation of 12.3226, indicating a stable variable. This is far below the regional average of 25.2% and below the world average of 60.26% compared to the selected countries. The mean value of dependency ratio is 83.17634 as a percentage of the working age population and a standard deviation of 12.1376, indicating a stable variable. Gross National Income (GNI) per capita has a mean value of $1430.161 and a standard deviation of $1455.99. The standard deviation value indicates that there are variations in the GNI per capita of the selected countries in Africa. Education has a mean value of 106.3889 primary enrolment as a percentage of gross enrolment and a standard deviation of 19.1510, indicating a very stable variable. Inflation has a mean value of 9.281953 percent and a standard deviation of 24.2198 representing an unstable inflation rate in the continent. The mean value of GDP growth is 4.159874 percent and a standard deviation of 5.58404, showing an unstable variable. The mean GDP growth figure

Table 1. Summary statistics for determinants of financial inclusion

Variables	Observation	Mean	Standard deviation	Minimum	Maximum
FII	340	0.185806	0.15674	0.01422	0.75898
DCPS	340	16.05894	12.3226	0.00742	60.3846
DPR	340	83.17634	12.1376	59.0123	108.055
GNI per capita	340	1430.161	1455.99	294.185	7016.76
EDU	340	106.3889	19.1510	53.8744	149.308
INF	340	9.281953	24.2198	−8.97474	379.999
Y	340	4.159874	5.58404	−46.0821	33.6294
IQI	340	−0.00061	0.97804	−1.96173	2.68144

Source: Author's own compilation, 2022

Table 2. Summary statistics on factors that influence barriers of financial inclusion

Variables	Observation	Mean	Standard deviation	Minimum	Maximum
Barrier	32	0.17516	0.09267	0.02	0.41
DCPS	32	24.32626	20.41339	1.690735	102.343
GNI per capita	32	2037.458	2304.007	421.4186	10,917.59
EDU	32	103.4639	18.04538	71.94276	143.179
GOVEXP	32	16.28305	10.31445	4.325225	55.59507
TO	32	62.77313	24.34271	26.3476	144.952
MS	32	39.4813	27.13653	12.6728	119.3832
IQI	32	0.030339	0.921812	−1.662604	2.118003

Source: Author's own compilation, 2022

Table 3. Shows the unit root test results for the panel data

Variable	I (0)	P-value
FII	−3.6063	0.0002
DCPS	−5.1428	0.000
DPR	−1.7134	0.0433
GNI PER CAPITA	−3.6469	0.0001
EDU	−3.1584	0.0008
INF	−7.3059	0.000
Y	−4.8665	0.000
IQI	−3.0322	0.0012

Source: Author's own compilations, 2022

shows a growth rate that is a little higher than the sub-regional average estimate, which is reported to be 4% in 2021 (WDI, 2022). Institutional quality index has an average value of −0.00061 and a standard deviation of 0.97804. This means that the variable is unstable, signifying that there are variations in the institutional quality index, which suggests weak institutions in the continent.

The average rate of barrier found to be 0.17516 and a standard deviation of 0.09267, signifying a stable variable. The mean of domestic credit to private sector was identified to be 24.32626 percent of GDP and a standard deviation of 20.4139, indicating a stable variable. GNI has a mean value of $2037.161 and a standard deviation of $2304.077 indicating that there are variations in the GNI of the selected countries in Africa. Education has a mean value of 103.4639 primary enrolment as a percentage of gross enrolment and a standard deviation of 18.04538 indicating a stable educational variable. Government expenditure has a mean value of 16.28305 percent and a standard deviation of 10.31445, indicating a stable outlook. The mean value of trade openness is 62.77313 percent and a standard deviation of 24.34271, indicating a stable variable. Money supply was found with a mean value of 39.4813 and a standard deviation of 27.13653. This indicates a very stable money supply regime. Institutional quality index has an average value of 0.030339 and a standard deviation of 0.912181. The mean and standard deviation values means that there are fragile institutions within the economy of the selected countries.

4.2. Results of the Unit Root Test

The result indicates that financial inclusion, domestic credit to private sector, dependency ratio, GNI per capita, education, inflation, GDP growth and institutional quality are all stationary at the level [I (0)] meaning they are stable and can be used for the study.

4.3. Analysis of the differenced-GMM results

The results of the analysis show a chi-square value that is significant at 1% level of significance. This shows that domestic credit to private sector (DCPS), dependency ratio (DPR), GNI per capita, education (EDU), inflation (INF) and institutional quality index (IQI) are jointly significant. The estimates are contained in Table 3. The unit root test, as contained in Table 4, indicates that the variables are stable, as such can be used for the study. This means that the study will not provide spurious results.

The results also indicates that there is no autocorrelation in the results, implying that the variance of the error term is not biased.

4.4. Demand-side factors that influenced financial inclusion

GNI per capita was found to be significant at 1% level of significance. The sign and the magnitude indicate that when per capita income of households increases by a dollar, it will result in an increase in the index of financial inclusion by 0.000023. When the GNI per capita of a country

Table 4. Differenced-GMM estimates showing determinants of financial inclusion in Africa

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Financial inclusion index (−1)	0.777233*** (7.11)	0.659430*** (5.10)	0.743924*** (7.37)	0.740977*** (7.12)	0.742587 *** (7.36)	0.746316*** (7.54)	0.746568*** (7.51)
Domestic credit to private sector	0.001695** (2.51)	0.001797** (2.87)	0.002066*** (2.96)	0.002070***	0.002077 *** (2.97)	0.002114*** (3.01)	0.002063*** (3.02)
Dependency ratio	−0.000627 (−1.10)	−0.000815 (−1.47)	−0.000723 (−1.24)	−0.000704 (−1.31)	−0.000733 (−1.23)	−0.00058 (−1.29)	−0.000737 (−1.22)
GNI per capita	0.000023*** (4.77)	0.000315** (3.34)	0.000026*** (2.71)	0.000026*** (2.74)	0.000026*** (2.68)	0.000027*** (2.89)	0.000026*** (2.79)
Education	0.000082 (0.56)	0.000007 (0.04)	0.000072 (0.44)	0.000060 (0.33)	0.000058 (0.39)	0.000120 (0.72)	0.000084 (0.61)
Inflation	−0.000002 (−0.10)	0.000005 (0.17)	−0.000005 (−0.18)	−0.000010 (−0.33)	−0.000005 (−0.19)	−0.000005 (−0.19)	−0.000006 (−0.2)
GDP growth	0.000013 (0.05)	0.000063 (0.26)	−0.000010 (−0.04)	−0.000005 (−0.02)	0.000002 (0.01)	−0.000055 (−0.21)	−0.000015 (−0.06)
Institutional quality index	0.008958* (1.65)						
Political stability		0.269802** (2.01)					
Governance effectiveness			−0.003339 (−0.50)				
Regulatory quality				−0.010973 (−0.59)			
Rule of law					−0.005663 (−0.54)		
Control of corruption						0.014106 (1.41)	
Voice and accountability							0.000305 (0.52)
Constant	0.0309388 (0.47)	0.045684 (0.54)	0.034755 (0.50)	0.035801 (0.51)	0.040067 (0.58)	0.040067 (0.58)	0.036937 (0.52)

(*Continued*)

Table 4. (*Continued*)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
AR Wald chi2(6) P-value	882.52*** 0.0000						
Order	Z	P-value					
1 2	−1.6256 1.529	0.1844 0.2341					

Note: Model 1: Determinants of financial inclusion with the effect of overall institutional quality index; Model 2: Determinants of financial inclusion with the effect of political stability indicator; Model 3: Determinants of financial inclusion with the effect of governance effectiveness indicator; Model 4: Determinants of financial inclusion with the effect of regulatory quality indicator; Model 5: Determinants of financial inclusion with the effect of Rule of Law indicator; Model 6: Determinants of financial inclusion with the effect of control of corruption indicator; Model 7: Determinants of financial inclusion with the effect of voice and accountability indicator.

Source: Author's own compilations, 2022 Notes: Values is bracket are t-starts. *, ** and *** denote significance at 10, 5 and 1%, respectively

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Table 5. OLS estimates on effect of financial barriers on determinants of financial inclusion in Africa

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Domestic credit to private sector	0.1262737 (0.96)	−0.0504054 (−0.37)	0.1996359 (1.16)	0.0366324 (0.23)	0.0662432 (0.44)	0.1262735 (0.96)	−0.1185201 (−0.86)
GNI per capita	−0.1716868 * (−1.74)	−0.2513657 (−2.20)	−0.1176285 (−0.98)	−0.2308326** (−2.14)	−0.1892495 (−1.67)	−0.1716868* (−1.74)	−0.2853483 (−2.72)
Education	0.3518557 (1.05)	0.1503061 (0.37)	0.2756284 (0.80)	0.1242393 (0.35)	0.1905085 (0.54)	0.3518559 (1.05)	0.0960995 (0.27)
Government expenditure	0.1632424 (1.32)	0.073734 (0.55)	0.0885638 (0.72)	0.0768707 (0.59)	0.081354 (0.63)	0.1632424 (1.32)	0.0685688 (0.52)
Trade openness	0.0676302 (0.40)	0.0291933 (0.15)	0.0135294 (0.08)	0.0420556 (0.23)	0.029397 (0.16)	0.0676301 (0.40)	−0.0285473 (−0.15)
Money supply	−0.3539749* (−1.76)	−0.190369 (−0.84)	−0.4027752 (−1.77)	−0.2579051 (−1.13)	−0.2888351 (−1.31)	−0.3539748 (−1.76)	−0.1250342 (−0.58)
Institutional quality index	−0.2383465** (−2.57)						
Political stability		−0.0359236 (−0.33)					
Governance effectiveness			−0.367948** (−2.06)				
Regulatory quality				−0.1533135 (−0.98)			
Rule of law					−0.2260403 (−.2260403)		
Control of corruption						−0.3610586*** (−2.57)	
Voice and accountability							0.0777554 (0.67)
Constant	0.5913111 (0.34)	2.396374 (1.06)	0.6675196 (0.35)	2.22434 (1.23)	1.63722 (0.88)	0.3710032 (0.21)	3.169792 (1.81)
Heteroskedasticity	1.74 (0.1871)						

Note: Model 1: Factors that influence barriers to financial service usage with the effect of overall Institutional quality index; Model 2: Factors that influence barriers to financial service usage with the effect of political stability indicator; Model 3: Factors that influence barriers to financial service usage with the effect of governance effectiveness indicator; Model 4: Factors that influence barriers to financial service usage with the effect of regulatory quality indicator; Model 5: Factors that influence barriers to financial service usage with the effect of Rule of Law indicator; Model 6: Factors that influence barriers to financial service usage with the effect of control of corruption indicator; Model 7: Factors that influence barriers to financial service usage with the effect of voice and accountability indicator.

Source: Author's own compilations, 2022; Note: Values is bracket are t-starts. *, ** and *** denote significance levels at 10, 5 and 1%, respectively

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increase, it means that the income levels of the citizenry improve all things being equal. This will enable them to save, invest and position themselves against any risk and thereby encourage them to patronize financial products. Increased in income increases demand for goods and services within an economy. This promotes businesses since industry has to produce more to meet the demand, leading to employment creation, more income and as such promote participation of households in the financial sector. This finding is consistent with the findings of Park and Mercado (2018), Fungacova and Weill (2015), Olaniyi and Alenoghena (2017) and Honohan (2008), who all indicated that income and financial inclusion are directly related.

Dependency ratio (DPR), Education (EDU), GDP growth (Y) and Inflation (INF) were however found to be insignificant even at 10%, indicating that per the study, these variables do not influence financial inclusion in Africa. This confirms the study by Honoham (2008), who indicated non-bearing relationship between primary education and financial inclusion levels. Olaniyi (2016) also corroborates the fact that inflation has insignificant effect on financial inclusion

4.5. Supply-side factors that influenced financial inclusion

Domestic credit to private sector was identified to be significant at 1% level of significance. The sign and the magnitude of the variable indicate that a percentage point improvement in domestic credit to private sector provided by domestic banks will results in an increase in the index of financial inclusion by 0.001695. Credit provided to the private sector will enable households and firms to produce more which will improve their profit margins and encourage them to save and invest as well as empower them to withstand any risk. Improvement in income as a result of increase in productivity will also lead to employment creation. This will enable the beneficiaries to get included in the financial sector as a result of the earned income from the employment generated. Empirically, it is evident that when households and firms have access to financial services like credit, savings and payments, it has the potential to promote financial inclusion. This finding is consistent with OECD (2020) and Nsiah et al. (2021) who indicated that access to credit has the tendency to empower households through income and encourage participation in the financial sector, which is in contrast with the assession by Olaniyi (2016), who argued that domestic credit to private sector do not impact on financial inclusion.

4.6. Infrastructural factors that influenced financial inclusion

Institutional quality was also found to be significant at 10% level of significance. The magnitude and the sign indicate that a unit increase in the index of institutional quality will result in an improvement in financial inclusion index by 0.008958. This means that as institutions operating within the economy functions effectively, it promotes confidence and trust of households and firms in the financial sector and as such encourage them to participate, leading to improvement in financial inclusion. This finding is consistent with Olanrewaju et al. (2019), Nkoa and song (2020), Nguyen and Ha (2021), P.W. Muriu (2021), Ali et al. (2022), Abaidoo and Agyapong (2022), Aracil et al. (2022) and Ouechtati (2022), who indicated that institutional quality is essential in encouraging both households and firms as well as financial service providers in smooth participation in the financial sector.

The individual indicators of the institutional quality framework were tested to find out how each contribute to improvement in financial inclusion. Aside the political stability component, no other indicator was found to be significant even at 10% level of significance. The political stability component was found to be significant at 5% level of significance. The magnitude and sign indicate that a unit increase in the political stability component of the institutional quality index will increase the index of financial inclusion by 0.269802. Stability of the political regime is very key because it promotes peace and ensures trust of the citizenry on the entire stability of the economy. This promotes free market and equal participation of all market players, leading to an increase in participation and hence promote financial inclusion. This finding is consistent with Allen et al. (2016), Mustafa et al. (2017) and Alhassan et al. (2019), who all indicated that political stability promotes financial development (inclusion).

4.7. Analysis of the OLS results

The study investigated the factors that influence barriers to financial services utilization. Due to non-availability of data for many years on the components that form the barriers to financial services used in this study, cross-sectional data were employed. The results show that there is no heteroskedasticity in the results indicating that the error is constant. The estimates of the OLS results are contained in Table 5.

GNI per capita was found to be significant at 10% level of significance. The sign and magnitude indicate that a one-dollar increase in the per capita income of the citizenry will lead to a decline in the index of the barriers to financial inclusion by 0.170080. This suggests that as the income of households and/firms increase, they are financially empowered to overcome the obstacles associated with accessing financial services and hence participate fully in the financial sector. Affordability is one of the barriers that has been considered in this study so increase in come will partly help to overcome this barrier, leading to improvement in financial inclusion. This is consistent with a study by Zins and Weill (2016) who indicated that low income is the highest barrier to financial inclusion in Africa and as such improvement of one's income will promote financial inclusiveness.

Money supply was also found to be significant at 10% level of significance. The magnitude and sign indicate that a percentage point increase in broad money will lead to a reduction in the barriers to financial inclusion by 0.3539749. An increase in money supply leads to reduction in interest rates and makes financial services affordable. This will ensure households and firms have the confidence to transact financial business. This will also lead to a high level of investment, viability and consumption as well as employment creation as a result of the reduction in the cost of accessing financial services. This finding is in line with the monetarists' assession that money supply is directly related to economic activities due to its impact in interest rates and cost of borrowing. Ajayi and Ojo (2006) and Fah et al. (2012) affirms this by indicating that changes in the quantity of money impact interest rates which increases liquidity and as such makes financial services affordable.

Institutional quality index was found to be significant at 5% level of significance. The magnitude and the sign show that a unit increase in the index of institutional quality will lead to a reduction of barriers to financial inclusion by 0.2383465. This indicates that as institutions operating within the economy function well, they will promote trust for instance, which is one of the barriers considered in this study and as such barriers to financial services utilization reduces. This is consistent with the work of Xu (2020) who posits that trust is a significant contributing factor in enrolling households/firms to the financial sector. On the individual components of institutional quality, only government effectiveness and control of corruption were found to be significant at 5% and 1%, respectively. The magnitude and sign indicate that a unit increase in the governance effectiveness will reduce barriers to financial inclusion by 0.367948. Also, unit increase in improvement in the control of corruption indicator will stimulate a reduction in the barriers index by 0.3610586. When corruption is eminent, it discourages households and firms from participating in the financial sector and hence bringing it under control eliminates or minimizes the barrier and as such inspire households to patronize financial products. This is consistent with the work by Yekini et al. (2019) who indicated that controlling the intensity of corruption has the ability to reduce barriers that lead to involuntary exclusion of households from the financial sector in Africa. Additionally, the study by Zulkhibri and Ghazal (2017) supports the finding that government effectiveness significantly reduces barriers to financial inclusion and as such promote financial inclusiveness.

Domestic credit to private sector, education, government expenditure and trade openness were however found to be insignificant even at 10% level of significance. This means that according to the study these variables play no role in eliminating barriers to financial inclusion in Africa.

5. Conclusion and Policy Implication

This paper examined the determinants of financial inclusion in Africa. The paper also looked at the factors that influence barriers to access of financial services. To holistically assess determinants of financial inclusion, especially Africa where poverty is rife, it is important to investigate it in many perspectives. The study therefore considered demand and supply as well as infrastructural side factors that influence financial inclusion. Financial inclusion is one of the panaceas that has been considered to end global poverty as backed by the World Bank and IMF, particularly in developing countries where there is low reception of financial services.

To estimate what influences financial inclusion in Africa, GDP growth, domestic credit to private sector, education, GNI per capita, inflation, age dependency ratio and institutional quality were investigated using twenty countries in Africa.

The results of the study show that DCPS significantly affect financial inclusion. It could therefore be deduced that when households and firms secure credits, it enables them to produce more and increase profit margins which would empower them to save and/ invest which will ensure their inclusion in the financial landscape.

GNI per capita was also found to be significant. It could then be concluded that an increase in per capita income of households promotes their inclusion in the financial sector and as such improves financial inclusion. Institutional quality was found to be significant, which can then be concluded that institutional quality plays an important role in promoting financial inclusion due to its ability to promote trust, discourage corruption and ensure safe financial landscape.

For the contribution of barriers to financial exclusion, GNI per capita, money supply and institutional quality were found to play a stimulating role in overcoming barriers to financial service utilization. It can therefore be concluded that when money supply increases coupled with an increment in per capita income within the environment of quality of institutions, barriers that constrain financial services usage are minimized.

Income level of households plays a significant role in promoting financial inclusion, which is rooted in the literature and confirmed in this study. It is therefore recommended that governments in Africa should institute measures that would encourage more citizens to partake in the financial system due to the low inclusion levels in Africa, by improving income levels of households through job creation by the government and the provision of congenial atmosphere for the private sector to thrive. Financial services must be made accessible, affordable and easy to use and have high quality for households and firms.

The private sector has been found to be an engine of growth. Efforts should therefore be made by development partners and financial institutions to offer affordable credits to the private sector through governments of member countries since the average loan advanced to the private sector was found to fall below the regional and world averages. Entrepreneurship should be encouraged especially among the youth, as the government of Ghana is doing through the Youstart programme that is intended to equip the youth with financial and technical assistance to create wealth. This will ensure a reduction in overdependence on government for employment and resources, which will lead to growth in the financial sector and the economy as a whole.

Institutional quality has been identified both theoretically and empirically as confirmed in this study, to contribute to efficient function of the economy, which includes the financial system. Efforts must be made by member countries and with technical assistance from development partners, to strengthen their institutions other than personalities so that they can sanitizes provision of goods and services in the continent.

Central banks in Africa should also empower the microfinance sub sector through the necessary regulatory interventions in order to serve its intended active but poor people. It is recommended that future studies should examine the determinants of financial inclusion from the perspective of demand, supply and infrastructural factors using the various income classifications. That is low, lower-middle- and middle-income groupings of countries in Africa.

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