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Financial inclusion and human development in frontier countries

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Abstract

This study empirically investigates whether the level of human development drives greater financial inclusion, and vice versa in the contexts of frontier markets. The dynamic panel generalized methods of moments (System-GMM) methodology is employed to analyze data spanning from 2005 to 2014 for twenty (20) frontier markets by Standard and Poor's Indices. The study finds that human development is a catalyst for financial inclusion scale-up in the banking industry, which in turn, augments the development process. It establishes fresh evidence that income level, financial literacy, and healthy lives are the decisive factors for financial inclusion scale-up in the banking industry. It finds new evidence that the underlying cause of low financial inclusion is low human development. The study concludes that low human development causes low financial inclusion. Also, promoting financial inclusion through the banking sector is very instrumental to stimulating human development, thus the reverse applies in frontier markets. The study implies that low living standards, poor health, high illiteracy, and deprived well-being and freedom largely account for low financial inclusion hence its spillover effect of having low human development in frontier market countries.

KEYWORDS

financial inclusion, financial literacy, frontier markets, human development, income, modern technology

1 | INTRODUCTION

In recent times, the importance of financial inclusion has become a vital developmental policy concern worldwide. Financial inclusion is usually described as access to and the use of formal financial products and services by low-income earners, poor households, smallholder farmers, small enterprises, and firms which hitherto were either under-served (under-banked) or unserved (unbanked). Thus, it is about encouraging all individuals, households, and firms to have access to the full benefits and use of mainstream financial products and services. Research shows that the levels of financial inclusion vary widely across the globe. According to the United Nations, approximately three billion people out of six billion around the globe lack access to formal financial products and/or services such as bank accounts, credit facilities, payments, insurance, and pension products (Chibba, 2007, 2008). Also, according to Demirgüç-Kunt & Klapper (2012), in several developing countries, the number of adults who own no bank accounts could be very high at about 90%, compared to most developed countries where one in five adults has a bank account and/or access to other alternative products or services provided

by other formal financial systems. Moreover, they document that worldwide 2.5 billion people lack a safe place to save their idle funds, borrow funds, make payments, insure and/or a secure and efficient means to receive social benefit payments through a formalized financial sector. Besides, Zwedu (2014) observes that in Ethiopia, less than 8% of Ethiopians have bank accounts with the proportion of borrowers being smaller. Yet, the focus of financial inclusion is to ensure that all or a greater proportion of the population and sectors are actively engaged in the processes and opportunities of economic development through the mainstream financial sector.

The important question is can the entire population and firms be engaged through the mainstream financial sector when the fundamental driver of financial inclusion is either lacking or woefully inadequate? For instance, when a significant proportion of the population has low, irregular or no income, unemployment rate is high, and there is also high financial illiteracy and unhealthy lives. A country that lags behind in human development cannot promote financial inclusion. This claim aligns with Sarma & Pais (2011) that the level of economic development proxied by human development promotes financial inclusion. Financial inclusion, therefore, is unlikely to scale up in the near future, if it is not supported by appreciable levels of human development. Moreover, economic intuitions suggest that economic development comprising human development is sine qua non to the achievement of financial inclusion (Beck et al., 2009; World Bank, 2008).

Most studies on financial inclusion have focused on the state of financial inclusion in developing countries (Demirgüç-Kunt & Klapper, 2012; United Nations, 2007; World Economic Forum, 2009); financial inclusion and poverty (Chibba, 2009; Osei-Assibey, 2011; World Bank, 2015) determinants, challenges, and opportunities of financial inclusion (Dev, 2006; Kumar, 2013). All these prior studies either ignored or did not adequately scrutinize the role of the degree of human development in promoting financial inclusion from the perspective of frontier markets. Also, though there are limited studies on financial inclusion and economic development (Bihari, 2011; Sarma & Pais, 2011), the current study differs from Bihari (2011) and Sarma & Pais (2011) in many ways. The work of Sarma & Pais (2011) was conducted on financial inclusion and development, and it explored 49 countries. Also, their study employed the OLS methodology, which does not eliminate potential biases associated with simultaneity, omitted variables, and reverse causality; hence it ignored the possibility of bicausal impacts. Moreover, due to limited data, it applied the index of financial inclusion developed by Sarma (2008). But, this current study utilized data from highly recognized international sources, which is more comprehensive, standardized, and reliable for the analysis.

On the other hand, Bihari (2011) probed financial inclusion impact on economic development and likewise, neglected the possibility of economic development influencing financial inclusion. Moreover, the study focused on only one country: India. The current study however, is conducted on twenty frontier markets, and it considers bidirectional relations by using the dynamic panel methodology for the empirical analysis. It, therefore, captures both time series and cross-sectional dimensions of the estimations and controls for potential biases associated with omitted variables, measurement error, simultaneity, and reverse causality.

Therefore, contrary to the generally held belief in the literature that financial inclusion initiates or triggers the development process, this study proposes and contends that nations that lag behind in their human development cannot promote financial inclusion and thereby stimulate the development process. This assertion supports the World Bank (2008) empirical evidence, which links finance directly and broadly to individuals, households, rural communities, and small holder firms' wellbeing. The proposition that the level of human development drives or impedes financial inclusion in frontier markets context seems to rest largely on theory than on empirical evidence. It is obvious that studies in these areas are woefully inadequate hence they provide limited guidance for public policy initiatives on inclusive finance i.e. financial inclusion (World Bank, 2014). But then, without proven empirical evidence, frontier markets cannot design realistic developmental and financial policies intended to promote greater financial inclusion and thereby augmenting the level of human development. In this regard, the study empirically examines whether the level of human development fundamentally drives financial inclusion and vice versa in the case of frontier markets.

The remainder of the study is set out in four more sections. The second section evaluates literature. The third section describes the methodology applied. The fourth section presents and analyses the results, while the fifth highlights conclusions and policy implications and offers policy recommendations.

2 | LITERATURE REVIEW

2.1 | Finance and development

One of the pioneering theories on finance and development was by Schmpeter (1911). He theorized that a well-functioning financial system can promote economic growth by technological innovations that may occur as a result of efficient allocation of funds. Moreover, the predetermined components of a developed financial system are robustly correlated with future rates of economic growth, physical capital accumulation, and economic

efficiency improvement. Thus various measures of the level of financial development are strongly linked with growth of real GDP per capita, the rate of physical capital and improvements in the efficiency with which economies employ physical capital. Contrarily, Robinson (1952) contends that developed financial system occur as a result of improvement in economic performance and maintain that "Where enterprise leads finance follows." Thus, financial sector operation merely responds to economic development, adjusting to changing demands from the real sector, and for that reason overemphasized. Also, Lucas (1988) and Stern (1989) consider finance as unimportant factor of growth. But few studies emphasis on the possible negative or no linkage between finance and growth (development).

Greenwood & Jovanovic (1990) developed a model that envisages a nonlinear linkage among finance, income inequality, and development. They argue that at all phases of economic development, financial development improves capital allocation, boosts aggregate growth, and thereby aids the poor via this channel. However, they echoed that the distributional effect of financial development, and subsequently the net effect on the poor, depends on the level of economic development. According to them, in the initial stages of development only the rich can afford to access directly benefit from financial systems. But at higher levels of development, many people can access and use the financial systems and by so doing developed financial systems directly help a larger proportion of society. Since development encompasses human development, improvement in financial system may mean ability for more people to acquire funds to meet basic needs such as food, clothing, shelter as well as pay for school fees, medical bills and engage in economic activities to earn basic income.

Well-performing financial system is an important predictor of future growth rates (Levine, 2005). The author maintains that the five fundamental functions of the financial system, which are mobilization of savings, allocating of resources, risk management, facilitating of goods and services, and exerting corporate control drive growth through capital accumulation and technological innovation. This in economic terms suggests that finance fosters long-run growth by stimulating the amount of capital in the economy and also through its effect on the technological progress rate, comprising human and physical capital in the form of investment in health and education, and as well in machinery and equipment.

According to Beck et al. (2007) finance may impact the life of the poor through two main channels: aggregate growth and changes in the distribution of income. The authors posit that rate of growth of per capita income of the poorest quintile equals the growth of average per capita income plus the growth of the Lorenz curve, which captures changes in income distribution. They put forward the direct functions of average growth and changes in income, showing that changes in absolute poverty are as a result of improvement in welfare through finance. This theory suggests that the poor require money to go to school, seek good healthcare, and engage in economic activities. So once the poor have access and can participate in the use of mainstream financial services, then they can either save, borrow or make payments to enjoy good healthcare, education and/or engage in economic activities to earn income. The outcome of the aforementioned is the foundation to human development.

Most of the prominent theories support the significant role of finance as a factor of growth, hence development, whilst few observe reverse or insignificant association. In this respect, theoretically there may be causal relationships between finance (financial inclusion) and growth (development) from either direction. Moreover, improvement in the financial system widens access and usage of mainstream financial instruments and products, makes credit, savings, and advisory services available to especially most poor people and firms. But in the absence of well-performing financial system and hence inclusive finance, most poor people and firms will be compelled to fall or rely on alternative sources of finance, which if available, comes at a high cost. Therefore by extension, where there is well-performing financial system, there is the presence of greater financial inclusion. More people will be financially resourced to obtain basic incomes (through engagement and participation in economic activities), healthcare and education, thereby guaranteeing appreciable human development.

2.2 | Financial inclusion and human development

According to Peet & Hartwick (2009) human development symbolizes making a better or enhanced life for everyone. A better life for all entails satisfying basic needs, that is, enough food to keep a good health, a harmless and fit place to live, cheap services obtainable by everyone, and being handled with dignity and respect. On the other hand, financial inclusion refers to access and utilization of affordable, available, accessible, convenient, and customized financial products and services to the enormous un- or under-served economic agents and/or excluded people, groups, and sectors. This thinking is in line with Demirgüç-Kunt & Klapper (2012) that financial inclusion means access to, and use of financial products and services at a formal financial sector.

Financial inclusion is a developmental policy priority that helps to eradicate poverty by inducing savings and

offering credit facilities to poor people, groups, and vulnerable sectors. It empowers and shapes who can afford quality education and lifelong learning (knowledge acquisition), healthcare and healthy lives (long life), who can earn decent income (improved living standards); who can reach and engage in a decent employment, business start-up; and who can pursue his/her economic dreams or prospects among others. Studies show that lack of access to financial services restrict growth and development (Demirguc-Kunt et al., 2008; World Bank, 2008), and hence human development. Financial inclusion addresses the importance of access to and use of financial services for development, equality, and poverty reduction, as it offers widespread access and utilization of finance for un- or under-served groups and sectors. Also, it offers financial opportunities to everyone to empower, equip, and build their capacities. Thus, financially empowered hitherto excluded groups could seek or afford basic education, healthy lives, earn income, and enjoy better wellbeing and freedom.

Also, this view is reinforced in a statement made by the former UN Secretary General, Kofi Annan:

> "*The stark reality is that most people still lack access to sustainable financial services, whether it is savings, credit or insurance. The great challenge before us is to address the constraints that exclude people from full participation in the financial sector...Together, we can and must build inclusive financial sectors that help improve their lives"(*Annan, 2002*).*

This statement is a clear indication that addressing the problem of low financial inclusion calls for a multifaceted approach. Financial inclusion cannot scale up safely when there is no or low human development, which implies no or low income (poor living standards), no or low sound health (unhealthy lives), and no or low literacy levels (high financial illiterates) among a few others.

Also, according to researchers, practitioners, policymakers, and development agencies, financial inclusion means "finance for all" (Chibba, 2009; Marshall, 2004; World Bank, 2008), but this cannot be achieved without higher levels of human development. In addition, surveys show that some of the evident-based developmental components that inhibit financial inclusion include low, unstable, or no income, high illiteracy rates (lack of knowledge and understanding), poor infrastructure or limited access to social amenities, high cost of financial services, and regulatory challenges (World Bank, 2014; World Bank, 2015). Globally, low income was the most cited reason for not having bank accounts (World Bank, 2015). Individuals or households with low, irregular, or no income may not be able to meet their basic needs—food, clothing, shelter—let alone have surplus money to save. Employment status is of critical importance to financial inclusion, as no job-high unemployment—, irregular or unstable and informal employment results in lack of creditworthiness and poverty—inability to save. In support, according to the United Nations Secretary General's special campaign on financial inclusion for development, 'a country's financial sector can contribute to equitable and faster economic growth and social development when it engages the whole population and effectively serves enterprise activity' (United Nations, 2013).

The World Bank and Global Financial Inclusion Databases (2014) indicate that globally, in 2011, only about 50% of adults owned accounts at a formal financial sector. The percentage of adults who had and used accounts on average ranged from about 20% in low-income countries, to nearly 90% in high-income countries. Also, from 2004 to 2012, commercial bank branches increased from three to five in Africa and from eleven to twenty-three in Latin America, while ATMs also surged in Eastern Europe around the same time span. Global Findex (2011) indicates that mobile money achieved the broadest access of 140% of adults reported having used mobile money in Africa. Required documentations, terms and conditions such as insufficient documentation, collateral and stringent conditionality, rigid identification requirement and other requirements serve as constraints to finance available to potential customers. For instance, in Cameroon, to own a checking account, the smallest amount required is more than $700, compared to Swaziland and South Africa where no minimum deposit is required, and it is also more than the average GDP per capita of a country.

Ardic et al. (2011) document that 56% of adults worldwide do not use formal financial services but the numbers differed across high-income and low-income countries. High-income countries had 17% of unbanked adults, while low-income countries had as high as 64% unbanked adults. They establish that informal financial services were more expensive and less dependable than formal financial services. For that reason, attractive and affordable formal financial services provided for the unbanked should be the core of policymakers' agenda as it will lead to improved lifestyles. Also, account penetration among adults belonging to the poorest 20% in high income countries is 23% higher than that of adults belonging to the richest 20% in the developing world (Allen et al., 2011). Additionally, approximately 20% of unbanked adults cited cost, distance and documentation as the reason for not owning and using an account. For instance, in West Africa, 36% of adults cited documentation as the second reason for not owning and using an account, while in East Africa, 46% cited cost as the

second reason and distance as the third reason for not owning and using an account. In South Africa, fixed fees and high cost of opening and maintaining an account were cited as the hindering factors for having and using an account (Demirgüç-Kunt & Klapper, 2012).

Besides, the FinScope Survey report (2013) produced by FinMark Trust, indicates that South Africa had shown remarkable improvement in financial inclusion in terms of banking deposits, borrowing, and insurance (from 28.9 million people in 2012 to 30.7 million people in 2013), but it was still limited in the use of other financial inclusive mechanisms especially mobile banking. In contrast, financial inclusion in Namibia decreased from 51% in 2007 to 31% in 2011; where 62% of the population is banked, 65% are formally served, 46% use other formal products, and 13% are informally served (FinScope Survey, 2012). Likewise, high levels of unemployed youth and lack of basic amenities, especially in the rural areas, have significant impacts on the financial inclusive behavior of Ghanaians and Africans in general (FinScope Survey, 2010). The few Africans who save, borrow, or use payment products informally, do so to meet daily household demands or needs. Moreover, over a third of adults in Africa have only primary or basic education as their highest level of education attained. The less educated and small firms in Africa use mainly informal means to save and borrow money. Furthermore, the reports indicate that, generally, about 60% and above of African adults live in rural areas. Most of these adults rely on money from others, about 30% receive money from household members and about 20% rely on remittances from relations. Also, about 30% or below obtain income from salaries and wages with about 60 to 75% relying on farming activities to generate income. The vast majority fall within the lowest income bracket, while a sizable number of the adult population have no fixed or regular income and they receive income periodically (FinScope survey, 2010). This suggests that most people lack basic understanding and know-how to make informed financial decisions couple with their lack of credit worthiness impede financial inclusion.

Moreover, according to Demirgüç-Kunt & Klapper (2012), the low level of accessibility to banks is due to banks' proximity, lack of trust in banks, lack of required documentation, cost of documentation, religious and gender issues, and low levels of income. They observe that approximately 80% of people in Africa cited lack of adequate income as the main reason for either not owning or using a formal bank account. Also approximately 20% cited cost, distance and documentation as the reason for not owning and using a bank account. For instance, in West Africa, 36% of adults cited documentation as the second reason for not owning bank account, while in East Africa, 46% cited cost as the second reason and distance as the third reason for not owning an account, whereas in South Africa, fixed fees and high cost of opening and maintaining an account were cited as the hindering factors for owning and using bank account.

According to Beck et al. (2008), about 54% of the total population in Cameroon, 94% in Malawi, 93% in Uganda, and 81% in Kenya cannot afford the fees charged by mainstream banks for maintaining a checking account given their low and irregular income level. Moreover, in Sub-Saharan Africa, close to 32% of adults are unbanked because the location of a financial facility or branch is too far away. In Europe and Central Asia, about 31% are unbanked because they do not trust banks. In Latin America and the Caribbean, about 40% are unbanked because financial services are too expensive to afford (Allen & Carletti, 2008). In addition, proximity, that is, physical access to bank, branch location, ATMs, post offices, and mobile agents pose problems to particularly rural dwellers. Physical access-remote bank, branch, or the location of ATMs serve as a constraint to finance being available to potential customers. For instance, in Sub-Saharan Africa, close to 32 percent of adults are unbanked because the locations of financial facilities or branches are too far away (Allen et al., 2010).

Kempson (2006) states that "people with low incomes, no secure jobs, living on social security payments, and living in rural communities are financially excluded". On the Contrary, Bihari (2011) opines that financial inclusion is an essential requirement for building a uniform economic development both spatially and temporary, as well as ushering in higher economic and social equity. He emphasizes that access to financial services has a number of benefits to the individual, the community and the nation as a whole. Some of these benefits include providing individuals the opportunity to accumulate savings, access credit facilities, undertake investments, and protect themselves against income shocks, hence equipping them to withstand emergences such as illness, loss of jobs, or death in the family. In addition, financial inclusion protects people from exorbitant fees charged by money lenders and other informal financial service providers. Also, it enables governments to make payments like social security transfers into the bank accounts of beneficiaries. It offers opportunity for the poor or excluded to bring their savings into the formal financial system, and consequently, channel more funds into productive activities. Dev (2006) observes that financial inclusion is very critical for enhancing poor farmers' living conditions, rural non-farm small enterprises, and other deprived groups. He further establishes that the vulnerable having a basic account greatly increases the likelihood of saving. Subsequently, the author suggests that

banks see financial inclusion as a social responsibility and a business opportunity. Also, when formulating policies on say credit, advisory services must be added to mitigate the risk of underprivileged and vulnerable people.

Amaeshi (2006) studying the causes of financial exclusion in Nigeria finds that illiteracy is one of the foremost drivers of financial exclusion in Africa. Therefore, the author concludes that banks in Nigeria should take pragmatic steps to eliminate the prevalence of illiteracy-driven financial exclusion to enhance their brands by alleviating financial exclusion through corporate social responsibility; and in so doing, mitigate the probable risk of 'harsh' social regulations on the part of policy-makers to address the existence of financial exclusion in Nigeria. Besides, Osei-Assibey (2011) investigated the relation between financial inclusion and poverty reduction in Ghana by exploring the socioeconomic factors underlying financial exclusion. The study finds that the most prominent factors underlying voluntary self-exclusion are strong perception of access to finance difficulties, financial literacy, and negative cultural and religious beliefs on credit use. Also, it finds that high transaction cost, stringent collateral requirements, and other constraints like lack of financial records discouraged people, microenterprises and firms from borrowing and generally accessing financial services. Likewise, Sarma (2008) asserts that households are more likely to be college educated, enjoy higher degrees of consumptions, and have more financial access where they have and use bank accounts.

According to Dollar & Kraay (2000), developing countries that have experienced sustained high growth over the last few decades have abridged their absolute levels of poverty. Other empirical evidence show that while there are significant differences in the relationship between development and poverty alleviation across countries, the incomes of the poor tend to rise proportionately with average upsurge in incomes (Dollar & Kraay, 2001; Jalilian & Kirkpatrick, 2002). Buckland et al. (2005) aver that high financial inclusion is found in nations with low-income disparity. Subsequently, they conclude that high income inequality causes low financial inclusion in an economy. Also, being financially excluded could also mean no investment in human and physical capital, which will eventually dampen productivity and loss in welfare (Osei-Assibey, 2009). Beck et al. (2006) observe that financial inclusion depends on several factors such as cost, physical availability, and quality or range of products being offered. This implies that financial products and services must be affordable, accessible, attractive, and available when desired.

Moreover, Beck & Brown (2010) avow that in most transition economies, at household level, the possibility of owning a bank card or account increases with education, income, and wealth. They also find religion, minority, and urban-rural divide play imperative roles. Similarly, studies at the national level indicate that access to financial services can have positive outcomes for inequality and poverty reduction (Beck et al., 2009; World Bank, 2008), while Burgess & Pande (2005) examining state-led rural banks in India, between 1977 and 1990 using OLS, observe that expanding rural branches significantly reduced poverty at national level. Also, Morduch & Haley (2002) maintain that well-managed community-centered financial services and products can curb poverty, as access to finance could allow poor households to save, and in the future invest in human and physical capital, as well as insure themselves against health and income shocks.

Against this backdrop, the study identifies several developmental factors that constrain the less privileged, vulnerable groups, rural residents, small-holder farmers, small enterprises, and firms in the informal sector to have and use mainstream financial services and products, but prominent among them is the level of human development. Therefore, the extant body of literature on financial inclusion-human development affirms that the level of development, in particular the degree of human development in the form of education, health, and income plays an important role in scaling up financial inclusion, and vice versa.

3 | METHODOLOGY

The study used the dynamic panel generalized-methods-of-moments (System GMM) technique proposed by Holtz-Eakin et al. (1990), Arellano & Bond (1991), Arellano & Bover (1995) and Blundell & Bond (1998) for panel model estimations. First, dynamic panel instrumental variables allow one to exploit the time-series nature of the relationship between the variables with pooled cross-section and time-series data. It is the most appropriate method to apply when the cross-sectional data (N) is more than the time dimension (T) of the data. Second, by using this technique, one is able to remove any bias created by unobserved country-specific effects. Third, it controls for potential endogeneity bias, as the direction of causality between dependent and independent variables may run in both directions.

The evidence of reverse-direction presents an important issue of endogeneity that has been taken into account by this estimation technique: system GMM. Thus, applying this methodology bi-directional relations are predictable. It differences the dependent variables and uses the lagged values as regressors or instruments. The inclusion of the lagged dependent variable (e.g. lagged financial inclusion) as an independent variable transforms the model into a

dynamic panel instrumental variables model. This is necessary because, recent financial inclusion performance often depends on the previous year's performance. Also, it differences the regressors and uses the lagged values in levels of all the explanatory variables as instruments. It then combines difference and level regressors in a system. Moreover, two important diagnostic tests are performed. These include the Sargan test, which examines the overall validity of the instruments, and a second order autocorrelation tests, which also examines the hypothesis that the error terms are not serially correlated (Arellano & Bond, 1991; Baltagi, 2008). Consequently, the system GMM gives unbiased results, with the assumption that there is no second-order autocorrelation and that the instruments are not correlated with the error terms. In this light, the dynamic panel instrumental variables approach is considered a superior technique for examining the relationships mentioned.

3.1 | Model specification

The model specification and choice of variables are informed by the reviewed literature. The paper follows the work of Beck et al (2005 & 2006), while their work is a cross-sectional, the current study is panel. They used poverty but this work modified their model to include human development indicators, thus focusing on specific human development factors.

To specifically investigate the effects of human development on financial inclusion, equation (1) is stated in a model below:

$$FinInc\ln_{it} = \phi_i + \varpi FinInc\ln_{it-1} + \delta HumDevt_{it} + Z_{it}\lambda' + \mu_{it} \quad (1)$$

where ϕ_i is country unobserved effects; $FinInc\ln_{it}$ is financial inclusion for country i at time t; $HumDevt_{it}$ is human development for country i at time t; Z_{it} is a matrix of physical development (infrastructure: telephone, internet and electricity) for country i at time t $\mu_{it}$is error term.

Another estimation is carried out to test financial inclusion without the presence of human development and is specified as follows:

$$FinInc\ln_{it} = \varphi_i + \rho FinInc\ln_{it-1} + K_{it}\lambda' + \mu_{it}^{'} \quad (2)$$

where φ_i is country unobserved effects; K_{it} is a vector of financial inclusion determinants excluding human development index; $\mu_{it}^{''}$ is error term; K_{it} is the other determinants of financial inclusion excluding human development index, which consist of income level, financial literacy, employment status, infrastructure index, economic activity, financial charges (cost), proximity, and branchless avenues via mobile telephony and internet.

Furthermore, a general financial inclusion model is specified as follows:

$$FinInc\ln_{it} = \alpha_i + \beta FinInc\ln_{it-1} + A_{it}\gamma' + \mu_{it}^{''} \quad (3)$$

where α_i is country unobserved effects; A_{it} is a vector of financial inclusion determinants including human development index; $\mu_{it}^{''}$ is error term; NB is the determinants of financial inclusion comprise but not exclusively limited to human development index, income level, financial literacy, employment status, infrastructure (electricity, telephone and internet), economic activity, financial charges (cost), proximity, and modern telecommunication indicators.

Conversely, a general model for the impact of financial inclusion on human development is specified below:

$$HumDevt_{it} = \sigma_i + \varphi HumDevt_{it-1} + \rho FinIncIn_{it} + X_{it}\gamma^{'} + \mu_{it}^{'''} \quad (4)$$

where X_{it} is a matrix of human development determinants.

3.1.1 | Data

Data spanning from 2005 to 2014, for twenty Frontier Markets (Argentina, Bangladesh, Botswana, Cyprus, Ecuador, Ghana, Jamaica, Kenya, Kuwait, Latvia, Lebanon, Mauritius, Namibia, Nigeria, Panama, Pakistan, Qatar, Saudi Arabia, Sri Lanka, and Tunisia) by Standards and Poor's (S&P) July, 2014 indices were extracted and utilized. Because financial inclusion is a relatively new phenomenon, most countries in the sample did not have exploitable data before the 2000's. Moreover, because of mixing values, the panel is unbalanced for the estimations conducted.

In accordance with Demirguc-Kunt et al. (2008), Demirgüç-Kunt et al. (2013) and Čihák et al. (2013), one major segment of the financial sector-banking sector or industry-has been explored, and the inquiry variable; financial inclusion indicator employed for this segment of the financial sector is ATMs per 100,000 Adults. It use is supported by the works of Beck *et al* (2005 & 2006), Ardic et al. (2011), Demirgüç-Kunt & Klapper (2012). Considering ease of access and usage, ATM provides ease, speed and it is less costly leading to eclectic penetration. Data on ATM per adult is also readily and adequately available. Positive relation is expected and is sourced from the Global Financial Development (GFD) database (2015). This study utilized financial inclusion indicator (ATMs per adult) that focuses on the 'number of adults whose lives have been affected' by

varieties of financial products and services through technological innovations say ATM, instead of the 'amounts' deposited or loaned. Besides, due to the important role of modern technological devices in scaling-up financial inclusion, indicators such as mobile subscribers per 100 people, internet subscribers per 100 people, and telecommunication subscribers per 100 people (telephone—mobile and fixed phone subscribers per 100 people—and internet) are analyzed as major drivers of financial inclusion. The study estimated these variables independently and jointly to observe their individual impacts.

Also, in line with Sarma & Pais (2011), Ardic et al. (2011) and the various UNDP Human Development Reports, the study applied the human development index *as a predictor variable* in examining the relation between human development and financial inclusion. Researchers usually use gross domestic product per capita (GDP per capita or per capita income) and/or human development index (HDI) to proxy quality of life (human development) for the people of a country, but the use of either has its own limitations. For instance, GDP per capita does not take into account the work done by women (house wives) such as preparing food, household chores, and caring for children even though these constitute vital productive activity (Beneira, 2003). Moreover, unequal distribution of income (income inequality) implies GDP per capita is not a good indicator of the quality of life for the majority of people in a country.

Presently, the best known measure for quality of life of people in a society which all countries have has been the Human Development Index (HDI). The HDI combines per capita income of a country with two other indicators, that is, health (measured by healthcare/life expectancy) and education (measured by literacy rate) to obtain a single index. But, the HDI is considered as a partial measure of the quality of life of people in a society, this is because it ignores developmental factors like physical infrastructure such as paved roads, energy (electricity), and telecommunication devices (mobile telephony, internet). Although, the HDI has some shortcomings, it is used as the 'human development index' for the present study because it is a better proxy for measuring human well-being and freedom (United Nations Development Program, Human Development Report, 2015). It provides data that broadly represents the welfare of people (human development). This is also because financial inclusion is believed to enhance human development, which implies that having and using financial services impact positively on people's lives, particularly the poor and vulnerable. Moreover, it reduces income inequality and improves living standards. Data on HDI and its components were obtained from the UNDP Human Development Report (2015).

The following section describes the standard independent and control variables, which consistent with the literature evaluated influence the dependent variables.

3.1.2 | Description of other independent/control variables utilized

1. *Internet penetration*: Internet users (per 100 people)	It presents individuals who have used the internet (from any site) in the last 12 months, per 100 people.
2. *Mobile penetration*: Mobile cellular subscriptions (per 100 people)	It refers to mobile telephone services, which provide access to voice communication by means of cellular technology per 100 people.
3. *Telephone Penetration*	It is fixed telephone plus mobile phone subscriptions per 100 people.
4. *Telecommunication:*	It is telephone (fixed and mobile) plus internet subscriptions per 100 people.
5. *Income level*: Gross national income (GNI) per capita growth	It is the sum of value added by every resident producer in the economy, plus any product taxes minus any subsidies not counted in the valuation of output plus net primary income receipts divided by midyear population.
6. *Financial literacy/ Education*: Primary completion rate	It is the total new entrants in the last grade of primary education, divided by the population at the entrance age for the last grade of primary education.
7. *Health*: Life expectancy at birth, total (years)	It shows the years a newborn infant may live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.
8. *Market size /Rural Economy (Rural Population)*	It refers to people living in rural areas as defined by the nationwide statistical offices. It is estimated as the difference between total population and urban population.
9. *Employment status:* Unemployment, total (% of total labor force)	It refers to the portion of the labor force that is without work but available for and seeking employment.

(Continues)

10.	*Financial services costs*: Lending interest rate (%)	It is the bank rate that generally meets the short-term and medium-term financing needs of the private sector.
11.	*Rule of Law*	It captures perceptions of the degree to which agents have confidence in and abide by the rules of society.
12.	*Proximity (Branch Location)*	These are physical locations of commercial bank branches per 1000 Km^2. A positive relation is expected and is sourced from Financial Access Survey.
13.	*Infrastructure*	It is telecommunication (telephone and internet) plus energy-electricity use per capita.
14.	*Natural Resources*: Exports of goods and services (% of GDP)	It represents the value of all goods and other market services provided to the rest of the world.
15.	*FDI- Foreign direct investment*: net inflows (% of GDP)	These are the net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor.
16.	*Corruption Control*	It captures ability to curb the extent to which public power is exercised for private gain.

NB: Aside 9 and 10 for which negative relations are anticipated, positive relations are expected for all the indicators. Also, all the indicators are sourced from World Development Indicators (2015), aside 12 from Financial Access Survey (FAS) of IMF (2015), and 11 and 16 from World Governance Indicators (2015).

4 | RESULTS AND ANALYSIS

This section presents the descriptive statistics of the variables used for the study. Table 1 presents the descriptive statistics of the variables used for the study.

From Table 1, the financial inclusion parameters, that is, ATM per adult, mobile phone, telephone and internet usage reported average values of 30.39, 80.24, 13.82, and 25.56, respectively. This shows that mobile telephone is coming very instrumental in promoting financial inclusion in frontier countries. Also, it reported minimum values of 0.12, 1.97, 0.21, and 0.20; and maximum values 73.40, 194.51, 41.19, and 85.3, respectively. These values indicate that countries that fall within the maximum range have higher values of financial inclusion compared to countries within the minimum range where some countries are likely to suffer due to financial exclusion in the form of in-branch and digital banking services and products. Likewise, over the study period the HDI (human development index), the main predictor variable of interest, recorded an average of 0.69 with a minimum of 0.43 and a maximum of 0.85 for the countries selected. The individual components of HDI (i.e., income, education, and health) reported average of 8.24, 0.76, and 4.23, respectively, while the hd-class reported an average of 2.2, with a minimum value of 1 and a maximum of 4. The average (2.2) human development classification indicates that the levels of human development are improving in frontier market countries.

The control variables for financial inclusion registered mean values of 8.39, 41.43, 0.48, 16.51, and 11.74 for unemployment, market size, rule of law, branch location, and cost of financial services, respectively. This shows that unemployment is a major cause of the low financial inclusion in frontier market nations. The presence of active market, rule of law, and branch location a measure of proximity do facilitate inclusive finance, while high cost of financial services impedes the spread of financial inclusion. Equally, the controls for human development in the form of natural resources, FDI inflows, and corruption control registered mean values of 40.78, 4.07, and 0.48, respectively. These values suggest that aside human development, other factors influence the level of financial inclusion, but prominent among them is the degree of natural resources. This implies that more effort should be made to improve exports in order to foster development and promote financial inclusion in frontier market countries.

4.1 | Pearson's correlation matrix

Table 2 represents the Pearson's correlation matrix of dependent and independent variables of interest. The correlation matrix indicates that there is a strong relationship between the financial inclusion parameters and all independent variables for frontier markets across the span of study. From the result, we observe a strong correlation between most of the variables, which are likely to cause multicollinearity and heteroscedasticity problems. According to Grewal, et al. (2004), a correlation coefficient of more than 80% indicates multicollinearity between the regressors. To avoid this problem, the study adopts the system GMM approach, which has the potential of addressing such challenges.

4.2 | Sensitivity analysis

Sensitive issues such as fixed or random effects, endogeneity, cross-sectional dependency, and the presence of heteroskedasticity are essential for checking the fitness of the model and the validity of the estimation technique

TABLE 1 Descriptive statistics

	Observation	Mean	Median	*SD*	Minimum	Maximum
atmsperadult	186	30.39448	29.64835	21.02683388	0.124928	73.3955
mobilecellulor	200	80.23663	77.4174	43.99087925	1.96945	194.512
fixedtelephone	200	13.82028	13.6464	10.312032	0.207664	41.185
internetuse	200	25.55641	20.4608	20.65157111	0.199036	85.3
hdi (Human development)	200	0.690271	0.718806	0.118107128	0.433981	0.852421
hd_class	200	2.2	2	1.032146614	1	4
gnipercapita (income)	145	8810.35	4170.66	13455.44525	482.844	56667.8
lifeexpectancy (health)	200	69.87045	73.45735	8.087791162	48.1257	80.1289
grossenrollment (education)	153	76.53629	84.7126	23.32975575	24.0981	122.899
ruralpopulation (market size)	200	41.33726	40.774	23.62094515	0.939	81.703
unemployment	200	8.386	7.2	5.691729343	0.3	37.6
bankbranch (proximity)	196	16.51236	13.0111	13.84198231	2.59782	80.1384
lendingrate (bank charges)	147	11.73623	10.9092	4.448005669	4.56131	21.8742
exportsofgoods (natural resources)	196	40.77687	37.8883	18.16590867	14.324	84.056
foreigndirect (FDI)	200	4.072565	2.97336	4.351234486	-4.37738	30.9953
corrupt_ctrl	200	0.480385	0.521788	0.236030212	0.029268	0.923445
rule_of_law	200	0.483306	0.525944	0.225057835	0.066986	0.870192

Source: Computed from data collected for the study.

used by the study. Stata 13.1 is employed to test for the potential presence in each of the models.

4.3 | Hausman test for fixed or random effects

Table 3 presents the result of Hausman test. There exists arbitrarily distributed fixed individual effects as shown in the results below.

Fixed effects are confirmed by the Hausman test. The null hypothesis is rejected at 1% in favor of fixed effects as shown in Table 3. But the model cannot be estimated using Ordinary Least Squares (OLS) techniques due to the existence of endogenous variables.

4.4 | Endogeneity test

The null hypotheses confirm that OLS will be consistent because the variables are exogenous, as they are uncorrelated with the error term. First, residuals of the variables are obtained after regressing the variables on their instruments including the exogenous variables. The residuals are then tested for significance. The rejections of the null hypotheses prove that the variables are indeed endogenous. The significance test results are shown in Table 4.

From Table 4, the test results show that per capita GNI and education are correlated with the error term and are highly significant at 1%, while HDI and health are statistically significant 10%. The result confirms that OLS or fixed effects estimator will be inconsistent and also the results will be bias and unreliable if either is employed in the estimation analysis.

4.5 | Test for cross-sectional dependence

The test for cross-sectional dependence or contemporaneous correlation is carried out using the Pesaran CD test, which is suitable for a panel with the time dimension less than the cross-sectional dimension (micro panel). Table 5 presents the test result for cross-sectional dependence.

The test result shown in Table 5, fails to reject the null hypothesis, meaning there is no cross-sectional dependence among the micro panels. The probability value of "0.5017" suggests that there is not enough evidence for cross-sectional dependence among the cross-sectional units in the model. Also, the absolute value of the off-diagonal elements suggests a weak correlation between the error terms. In summary, the test result detects no dependency among the cross-sections.

4.6 | Wald test for heteroskedasticity

Table 6 presents the result of Wald Test for Heteroskedasticity.

TABLE 2 Pearson's correlation matrix of human development and financial inclusion variables results

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	atmsperadult	1																
2	mobilecellulor	0.5829	1															
3	fixedtelephone	0.578	0.2776	1														
4	internetuse	0.6205	0.8141	0.4068	1													
5	hdi	0.6301	0.5658	0.7627	0.6545	1												
6	hd_class	−0.5417	−0.3723	−0.7687	−0.5256	−0.92	1											
7	gnipercapita	0.3238	0.3382	0.457	0.4533	0.5642	−0.5545	1										
8	lifeexpectancy	0.3867	0.3642	0.5839	0.4895	0.8005	−0.7732	0.3562	1									
9	grossenrollment	0.6107	0.5436	0.6822	0.5426	0.8638	−0.7869	0.476	0.5499	1								
10	ruralpopulation	−0.5263	−0.3276	−0.461	−0.4234	−0.6353	0.6595	−0.4506	−0.4835	−0.6184	1							
11	unemployment	−0.0227	−0.1103	−0.0486	−0.1686	−0.0903	0.1357	−0.234	−0.3255	0.1206	0.0392	1						
12	lendingrate	0.1402	−0.2964	−0.1019	−0.2838	−0.2463	0.1986	−0.2092	−0.2057	−0.2519	0.0284	0.1386	1					
13	rule_of_law	0.342	0.3075	0.4665	0.3884	0.6144	−0.6043	0.4612	0.4404	0.5639	−0.2908	0.1193	−0.3247	1				
14	bankbranch	0.4749	0.2804	0.5098	0.3604	0.4022	−0.3563	0.1124	0.3714	0.3766	−0.3368	−0.0179	0.0588	0.1401	1			
15	exportsofgoods	−0.161	0.0486	0.0488	0.0686	−0.0449	0.0678	−0.0487	0.0064	−0.0054	0.0712	0.1027	−0.2236	0.1772	0.1296	1		
16	foreigndirect	−0.098	0.0167	0.0696	−0.0295	0.0064	0.0243	0.0158	0.027	0.0253	0.0385	−0.0241	−0.1182	0.0784	0.0786	0.2059	1	
17	corrupt_ctrl	0.3733	0.2623	0.4546	0.3276	0.5992	−0.6087	0.5196	0.378	0.5963	−0.4219	0.1849	−0.1982	0.8996	0.1538	0.1302	0.0449	1

Source: Computed from data collected for the study; significance at 1%.

TABLE 3 Hausman test for fixed or random effects

Null hypothesis (Ho)	Output
Difference in coefficients not systematic	Chi2(8) = (b−B)'[(V_b−V_B)^(−1)](b−B) = 18.17
(There is random effect)	Prob>chi2 = .0012
	(V_b−V_B is not positive definite)

Source: Authors' computation using Stata 13.1.

TABLE 4 Endogeneity test results

Null hypothesis (Ho)	F-Statistics	Prob > F
Human development index (HDI) is uncorrelated with the error term	F(1, 46) = 3.54	.0663
Per capita GNI (Income) is uncorrelated with the error term	F(1, 46) = 9.08	.0042
Education is uncorrelated with the error term	F(1, 46) = 7.71	.0079
Health is uncorrelated with the error term	F(1, 46) = 3.45	.0699

Source: Authors' computation using Stata 13.1.

TABLE 5 Test result for cross-sectional dependence

Null hypothesis (Ho)	Output
Cross-sectional independence	Pesaran's test of cross sectional independence = 0.683, Pr = 0.5017
	Average absolute value of the off-diagonal elements = 0.352

Source: Authors' computation using Stata 13.1.

TABLE 6 Wald test for heteroskedasticity results

Null hypothesis (Ho)	Chi2-statistics	Prob > chi2
Sigma(i)^2 for all i (Homoskedasticity)	Chi2(15) = 5610.56	.0000

Source: Authors' computation using Stata 13.1.

From Table 6, we reject the null hypothesis at 1% and conclude that heteroscedasticity is present in model. All the sensitivity analyses are necessary for the consistency and they support use of the system GMM estimator. Accordingly, the next section applies the System GMM and presents estimation results and discussions.

4.7 | System GMM results

This section presents the results of the system-GMM.

4.8 | Human development (HDI) and banking sector financial inclusion

Table 7 presents the regression results of the system GMM technique. The findings show that the levels of human development and financial inclusion scale-up as economies develop. The study establishes that a more human developed economy promotes greater financial inclusion, and likewise high financial inclusion in turn causes higher levels of human development. The study confirms the findings of Beck et al. (2007, 2010), which maintain that access to financial services accelerates development as it ensures equality of income distribution to the poor, low-income groups, and firms in the informal sector.

Human development is positive and statistically significant with financial inclusion in columns I and 3. Moreover, it finds positive and statistically significant values at different significance levels for income level in column 1, financial literacy and healthy lives in columns 1 and 3. The findings endorse empirical works that document that human developmental factors such as income or living standards (Ardic et al., 2011; Barr, 2004; Connolly & Hajaj, 2001; Demirgüç-Kunt & Klapper, 2012; World Bank, 2005), and literacy (Amaeshi, 2006; Osei-Assibey, 2011; Sarma, 2008; Zeti, 2005) are the underlying factors to promoting financial inclusion. Individuals or households with little or no education are more likely to be financially illiterate, and therefore lack knowledge, understanding and information on financial products, services, and basic financial management (Barr, 2004; Connolly & Hajaj, 2001; Kempson & Whyley, 1998). The finding supports studies that ascribe strong correlation between education attainment and financial literacy. Additionally, studies show that low, unstable or no income inhibits financial inclusion (World Bank, 2014, 2015). Low income was the most cited reason for not having bank accounts worldwide (World Bank, 2015). Ardic et al. (2011) find that as high as 64% unbanked adults are in low-income countries compared to only 17% unbanked adults in high-income countries. Individuals or households with low, irregular or no income do not have enough to meet their basic needs let alone have surplus money to save or guarantee credit worthiness. The

TABLE 7 Effects of human development and financial inclusion

VARIABLES	(1) Financial inclusion (Only Development)	(2) Financial inclusion (Excludes human development)	(3) Financial inclusion (All key determinants)	(4) Human development (HDI)
Human development (HDI)	**153.4*** (28.46)**		**322.4*** (104.7)**	
Income Level *(Living Standards)*	***6.072**** *(1.286)*		***−3.976*** *(4.300)*	
Financial Literacy *(Education attained)*	***0.966**** *(0.266)*		***25.08**** *(12.67)*	
Healthy lives *(Sound Health)*	***48.43**** *(9.605)*		***54.91**** *(29.81)*	
Mobile Penetration	***25.11**** *(5.567)*	***2.346**** *(0.602)*	***70.49**** *(26.11)*	
Internet Penetration	***21.73**** *(4.052)*	***1.362**** *(0.521)*	***39.59**** *(18.44)*	
Telecommunication	***27.04**** *(5.560)*		***60.14**** *(24.82)*	
Very high HDI (Standard of measure)			*0*	
High HDI countries			*5.994 (3.996)*	
Medium HDI countries			*−42.73*** (15.14)*	
Low HDI countries			*−60.66*** (22.01)*	
Employment status		−12.70***	−42.31**	
(Unemploy't level)		(2.314)	(20.54)	
Cost of financial services		−2.388 (7.094)	−44.26** (18.06)	
Proximity (branch location)		2.293*** (0.505)		
Market/local econ (rural population)		−11.53*** (1.766)		
Rule of law		15.04*** (2.441)	−0.360 (8.448)	
Financial inclusion				**0.00642*** (0.000927)**
Income level				0.0109*** (0.00311)
Infrastructure				0.00225** (0.00105)
Natural resources				0.0151*** (0.00230)
Investment (FDI % of GDP)				0.0472*** (0.0132)
Corruption control				0.00364* (0.00204)
Lag (previous performance)	0.655*** (0.0552)	0.578*** (0.0636)	0.211 (0.168)	0.954*** (0.0384)
Observations	98	121	70	167
Number of countries	18	16	15	20
Number of instruments	15	11	20	11
AR-1 (Prob.)	0.211	0.123	0.020	0.061
AR-2 (Prob.)	0.823	0.927	0.625	0.283
Sargan test (P-value)	0.135	0.129	0.142	0.181

***Note*: NB**: Banks' financial inclusion – ATMs per 100,000 adults; access to deposit monies with ease, make payment with ease and/or conveniently access funds via a formal banking sector. Also, Human development (HDI) comprises health (life expectancy), education (literacy), and income (per capita GNI) indices.
***p <.01.
**p <.05.
*p <.1.

finding buttresses studies that observe strong correlation between income level and financial inclusiveness. The findings of this study indeed signify that banks may promote more financial inclusion in the presence of appreciable level of human development. The findings, therefore, indicate that the core human development parameters are fundamental to furthering greater banking sector financial inclusion in frontier market countries.

Besides, the study finds positive and statistically significant values at different significance levels for telecommunication, which is an index of mobile phone, fixed phone,

and internet usage in columns 1 and 3; and mobile penetration and internet penetration independently in all the three columns. The findings agree with the empirical works, which document that modern technology such as ATMs (Amidžić et al., 2014; Kempson & Whyley, 1999), mobile telephony, internet and branchless services (DFID, 2008; Ignacio, 2008; Porteous, 2007) are important for promoting financial inclusion. The findings, therefore, suggest that the modern technological devices and financial innovations do matter for banking industry financial inclusion, and in particular mobile telephony and internet development is very critical.

Also, nations with medium and low HDI have negative and statistically significant values when compared to very high HDI nations. The findings validate the empirical evidence (Sarma & Pais, 2011) that human development is a prerequisite for promoting financial inclusion. Furthermore, it finds positive and statistically significant values at different significance levels for branch location in column 2, rule of law in column 2, and previous bank performance in columns 1 and 2. It finds negative and statistically significant values at different significance levels for unemployment in columns 2 and 3; cost of financial services in column 3; and strangely, rural population a proxy for the size of the economy at local level in column 2. Overall, the findings support the works by Marshall (2004), World Bank (2008), Chibba (2009), & Sarma & Pais (2011), which contend that a nation that lags behind in development cannot promote financial inclusion.

On the other hand, financial inclusion by the banking sector has positive and statistically significant value at 1% significance level with high degree of human development. The study documents that a banking sector with high financial inclusion equally fosters high degree of human development in the case of frontier countries. The findings substantiate Bihari (2011) that contends that financial inclusion is an essential necessity to constructing a uniform development and for ushering in higher economic and social equity. Besides, all the control variables for human development were positive and statistically significant. Thus, income level, infrastructure, natural resources, investment (FDI), and corruption control are positively significant at different significant levels. This result signifies that besides financial inclusion, income level, infrastructure, natural resources, investment (FDI), and corruption control do spur human development in frontier market nations. The analyses show how the relations between human development and financial inclusion play out in the course of intensifying human development. The study confirms the findings of Beck et al. (2007, 2010), which report that access to financial services facilitate development as it ensures equality of income distribution to the poor, low-income groups, and firms in the informal sector.

5 | CONCLUDING REMARKS AND POLICY RECOMMENDATIONS

This study examines whether the level of human development is the underlying cause of the extent of financial inclusiveness in the banking system of frontier countries. The study establishes that more developed society promote more financial inclusion through the use of ATMs to either save, borrow, or make payments. Likewise more and more financial inclusion tends to cause higher levels of human development in the form of improved living standards, literacy, and healthy lives. Moreover, the findings imply that to achieve greater financial inclusion, it is important to promote all the components of the HDI. The study, therefore, suggests that human development is indeed sine qua non to the achievement of greater financial inclusion. The findings support the works of Levine (1997, 2005) that maintain that development is a necessary condition for improved financial services. Besides, the findings indicate that modern telecommunication, especially in the form of mobile phones and internet, used to conduct and/or provide financial services have become a must for financial inclusion to scale up swiftly.

Also, increased financial inclusion will in turn alleviate poverty, reduce income inequality, and improve living standards of people, and thereby foster human development. The cost of financial services result suggests that borrowers are most likely to be worried about high bank charges and interest rates on loans. This is consistent with the works of Consultative Group to Assist the Poor (CGAP) (2009) and Klapper & Singer (2013) that cost is a deterrent to using formal financial services. In summary, the findings suggest that both human development (particularly income, health, and education) and modern technology (principally ATMs, mobile telephony, and internet) indicators have become crucial requirements for promoting financial inclusion in the banking system.

Aside human development factors, poor infrastructure such as poor transportation system, poor roads, poor telecommunication, and poor electricity supply deter potential customers from accessing the services of the formal financial sector. Also, financial charges for instance bank charges for opening and maintaining accounts are usually very expensive. High fees charged serve as a deterrent to potential customers to have and use formal financial products and services in the form of savings, credit, payments, insurance, and pensions.

The study recommends that development and financial inclusion scale-up should be the responsibility of all stakeholders: governments, development agencies, financial regulators, financial supervisors and service providers, clients and potential customers. The World Bank (2014) observes that improving access in the formal financial sector is a unique challenge that cannot be tackled only by the financial systems. That notwithstanding, aggressive financial inclusion promotion should be embarked upon by the entire banking industry to promote greater financial inclusion in the banking sector, and thereby further augmenting human development. Also, new deposits or savings methods through technological devices and branchless avenues need to be encouraged to aid customers to deposit and access monies 24/7. In addition, there should be promos and financial education on available products and services using local languages, and also training on how to use digital and branchless avenues to make services provided user-friendly. Furthermore, there should be relaxed conditions, terms and rigidities of opening and maintaining accounts. In addition, there should be strong linkages and collaborations among governments, financial regulators, financial service providers, and users. Also, rules and regulations on foreign funds inflows should be relaxed, and strong and modernized regulatory, supervisory and law enforcement institutions should be established.

Similarly, governments, policy makers, and developmental agencies should aim at a holistic approach to development instead of targeting sections of the developmental challenges. Rural communities should be developed through the provision of improved basic physical infrastructure or facilities like paved roads, reliable electricity, and telecommunication infrastructure. Besides, it is time to refer to "*corruption*"- a relatively lenient and decent word- as *"public stealing, public theft, or public robbery"*, and stiffer punishment should be meted out to offenders to make it unattractive. Also, there should be reforms in telecommunication infrastructure such as improved and modernized technological devices and financial innovations, branchless outlets, and innovative products. These measures if well-tailored should empower potential economic agents to participate in mainstream financial products and services, and this will foster harmonizing relationships between development and finance.

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APPENDIX

TABLE A1 The sample employed per region compose of the following twenty frontier markets

Latin America-Caribbean	Europe-Mediterranean	Asia-Pacific	Africa	Middle East
Argentina[2]	Cyprus	Bangladesh	Botswana	Ecuador
Jamaica	Latvia	Pakistan[2]	Ghana	Kuwait
Panama		Sri Lanka	Kenya	Lebanon
			Mauritius	Qatar
			Namibia	Saudi Arabia[1]
			Nigeria[2]	
			Tunisia	

Note: The term "frontier market" is used for developing countries with slower economies than "emerging market". Superscripts 1 and 2 indicate among top five and bottom five ranking, respectively, by Bloomberg's Most-Promising Frontier Markets, 2015 list.
Source: Author's compilation based on Standard and Poor's (S&P) July 1, 2014 Indices (Standard and Poor's Indices, 2014).