MOBILE TECHNOLOGY ADOPTION AND INCLUSIVE GROWTH: DYNAMIC PANEL EVIDENCE FROM WEST AFRICA[1]

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Abstract
This paper empirically examines the role of mobile technology adoption on inclusive growth using data for 15 West African countries (2004 – 2014) estimated with System Generalised Method of Moments (SGMM).It opines that inclusive growth can be achieved by increasing the availability, reducing the cost of Information and Communication Technology and utilising ICT in the value-chain processes of the economy. The GMM results showed that mobile cell subscription has a positive significant impact on inclusive growth. It concludes by recommending the need for increased investment in telecommunications industry, rendering of tax holidays to domestic ICT firms, among others.

Key Words: ICT; Inclusive growth; Mobile technology; SGMM.

INTRODUCTION

Scholars have been documenting the different possible drivers of economic progress among the different sectors within an economy; some, stating the importance of technology as a driving force for economic and human development under the new growth theory (Lucas, 1988; Romer, 1990; Boor, Oliveira & Veloso, 2014; Asongu, Boeteng & Akamavi, 2016). Although the economic growth rates as well as other economic indicators in some West African countries have been reducing recently (especially in 2015 and 2016) due to the oil price shock, it is still evident that during the period of rapid exponential economic growth, the levels of inclusiveness, gross domestic products (GDP) per capita, education attainment levels, health care availability, poverty, inequality and unemployment did not increase significantly and responsively. Thus, for countries to experience inclusive growth, economic or financial improvement alone is not sufficient; inclusiveness of the growth is necessary.

Information and communication Technology (ICT) during this era of globalisation plays a crucial role in the growth and development of an economy; it is among the indicators used in measuring the degree of sophistication of the investment 'climate' of a country. ICT can be

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viewed as a tool to increase efficiency and save time. ICT is a dimension (subset) of technology (alongside electricity **production**, transportation, and so on) that can be viewed as an obligatory indicator of the level of development attained by an economy and given the current trend of globalisation, ICT is a major tool for achieving this goal.

Old and conventional mediums of communication (through birds and smokes for signal) have been faced-out due to many limitations some of which are inefficiency, ineffectiveness, non-promptness, to which could be attributed to the advent of globalisation (Atkinson, 2009).The argument for developing countries to globalise is important and is designed to enhance access to foreign capital, improved technology in order to enhance the prospect for larger markets (Alege & Osabuohien, 2013). Globalisation has led to several innovations in technology such as the internet (Advanced Research Projects Agency-ARPA, 1962), mobile phones (1990s), television sets, personal computers, radios and others that have made communication everywhere around the world easier and faster. These modern tools for communication are collectively called Information and Communication Technologies-ICTs (Olise, 2010). ICTs assist in the sharing of knowledge – a knowledge-driven economy.

There is a somewhat consensus in the existing literature that the knowledge economy is key to economic development (Kuada, 2015; Tchamyou, 2015; Asongu & Le Roux, 2016). Knowledge-based economies have a higher chance of confronting the challenges that globalisation poses to development. Among the four components of the World Bank's Knowledge Economy Index (KEI), ICT is likely to exert the highest effects on economic and human development landscapes because of its potential for wide and fast adoption and penetration (Asongu & Le Roux, 2016). Mobile technology is an example of a technology product whose falling costs made it accessible to all income classes.

The adoption of mobile telephony has been one of India's success stories demonstrating the potential of ICT for inclusion. The Indian communication sector was in double digits after 2000 and its annual contribution to GDP growth is about 10%. India moved from 5 million cellular subscribers in 1991 to 37 million in 2001 and 898.02 million in 2013. The Mobile cell subscriptions per 100 at 72 in 2011 compared well with the US figure of 93. However, the mobile technology's contribution to GDP growth has fallen short of its potentials. Many other Emerging and Developing economies such as those in West Africa have had more success with the adoption of mobile technology (Goyal, 2013).

The choice of West Africa as the case study was informed by the following; First, West African countries have high levels of non-inclusiveness (such as poverty rates, inequality, low education enrolment rates, relatively low health care delivery, and so on) according to the World Bank data but despite these problems, there seems to be a relatively high level of utilisation of Mobile

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technology. Penard *et al.* (2012) reported that mobile phone and internet penetration rates in Sub-Saharan Africa (SSA) stood at 41 percent and 9.6 percent, respectively as of 2010. Secondly, Asongu (2015) suggests that while high-end markets in Asia, Europe and North America are stable in terms of growth of mobile phones, developing African markets are still substantial target market and business opportunities for mobile penetration. Asongu (2015) also points out that the prospects of mobile phone penetration in Africa are encouraging and these considerations motivate research in African context. This study employs the "system generalised method of moments" (SGMM) to underscore the linkage between mobile phone technology diffusion and inclusivity using a sample of 15 West African countries over the period 2004 to 2014.

The rest of the study is structured as follows: Section 2 reviews the literature relating to ICT, inclusive economic growth and the role of mobile phone penetration and inclusive development. The data and methodology are discussed in section 3; Section 4 presents the empirical results and the implications; while Section 5 concludes.

INSIGHTS FROM RELATED LITERATURE

From the literature, inclusive growth denotes both the pace and pattern of economic growth, which are assessed and interlinked together (World Bank, 2009). The rapid pace of economic growth is necessary for reducing absolute poverty, but for sustainability, it should be broad-based across sectors and inclusive of the large part of a country's labour force. Inclusive growth is economic growth that creates opportunities for all segments of the population and distributes the dividends of increased prosperity, both in monetary and non – monetary terms, fairly across society (Organisation for Economic Cooperation and Development-OECD, 2014).

The European Commission-EU (2001) defined ICT to denote a term concerned with the storage, processing, dissemination and management of information and knowledge adopting various types of software and equipment in a digital and non-digital form. ICT can be broken down into three components – Services, application and technology. Services entail the internet, emails and so on. Application involves management information systems, distance learning and teleconferences while technology ranges from the traditional technology (including radio, television, accounting ledgers) to modern technology (such as cellular phones, Internet access facilities).

Literature is starting to witness a large body of theoretical and empirical debate on ICT such as Mobile telephones and its effect on economic growth and inclusive growth. ICT so far, is seen as a medium for transfer of information. Most researchers on ICT adoption have focused on achieving economic growth through ICT (Ghosh, 2016; Imbert & Papp, 2015; Muralidharan, Niehansan & Sukthankar, 2014; Jack &Suri, 2011) without much emphasis on inclusive growth.

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Some researchers investigated ICT penetration on specific subsectors and sectors like the banking sector (Osabuohien, 2008); how Institutions matter for technological utilisation in Africa (Efobi & Osabuohien, 2015), the challenges and opportunities in technological diffusion for Economic progress in Africa (Osabuohien & Efobi, 2012), ICT and productivity in Europe and the USA (Ark *et al*., 2002; Daveri, 2002; Jorgenson, 2003), ICT and Agriculture (Aker & Fafchamps, 2010; Armstrong. & Gandhi, 2012; Asenso-Okyere and Mekonnen, 2012; Sangbuapuan, 2012; Chavula, 2013; Salampasis, & Theodoridis, 2013; Vosough *et al.,* 2015; Zhang *et al.*, 2016) among others.

Some researchers used primary data to evaluate the impact of ICT on Economies and Businesses due to the insufficient nature of large ICT data in the West African part of the world (which is due to the lateness in the adoption of ICT in this area) and the relative scarcity of research in ICT penetration in the area while some others used cross-sectional data for correlations (Asongu, 2013; 2014), extended the research to causality (Asongu *et al.*, 2016) for sound policy implications. However, the results were similar – ICT such as mobile phone technology adoption contributes positively to inclusive growth and the adoption and utilisation of ICT in sectors like agriculture can bring changes to the poor and needy areas in an economy such as food security (Kumar & Sankarakumar, 2012).The gap this research fills is in the use of secondary dynamic panel data for the quantitative analysis based on SGMM of mobile telephone adoption and inclusive growth in West Africa. Thus, this study makes contribution to the literature the examination of the role of mobile technology adoption in influencing inclusive growth drawing empirical evidence from West African countries.

ANALYTICAL FRAMEWORK AND METHOD OF ANALYSIS
ICT and Inclusive Growth – Human Development Linkage
Hameed (2006) emphasised on how ICTs such as mobile technology could improve sector performance and enable countries in terms of National Capacity building - Employment, International trade - Exportation as strategized and implemented by Pakistan. They have been productive so far. Johnson (2016) discovered that countries with high ICT adoption are usually characterized high levels of inclusive growth. The research showed that all countries in the world could be categorised into three; ICT Empowered Economies (ICTEE), ICT Adopting Economies (ICTAE) and ICT Deficient Economies (ICTDE). Johnson discovered that countries that are ICT empowered are characterised by high level of Inclusiveness, vibrant ICT Infrastructure, Low Inequality, low unemployment rate, high enrolment rate, large human capital development, and largest ICT investment. ICT adopting economies are characterised by moderate level of inclusiveness, relatively less robust ICT infrastructure, relatively high poverty and inequality rate, relatively high unemployment rate. ICT deficient countries are characterised by poor level of inclusiveness, huge digital divide, and low human capital investment, poor investment in ICT infrastructure, poor ICT infrastructure, very high unemployment and inequality rate.

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Worthy of note is the fact that the populace do not need word processing to survive, but they may want efficient ways to share information about livelihood and employment (Hameed, 2006). ICT for human development is not about the technology but about people using technology to meet some needs, thereby creating time for other things. ICTs such as Mobile technology could assist in job creation, facilitating education for all, research & development for more productivity, achieving financial inclusion and providing improved value chain interaction social media connection for networking purpose.
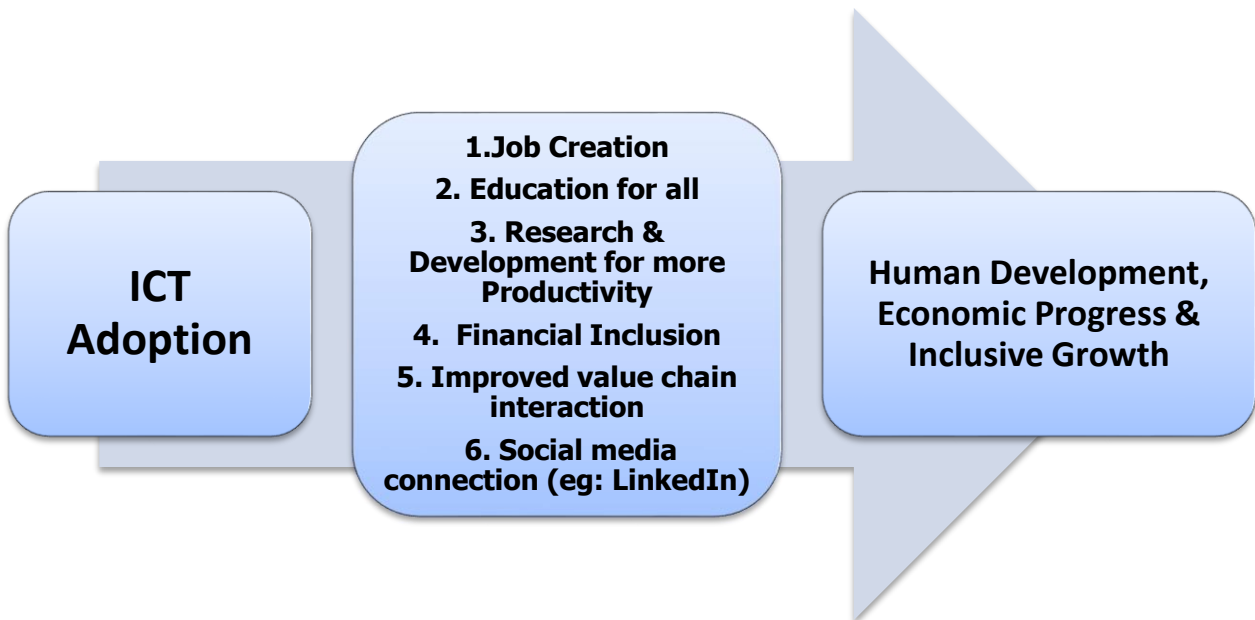
ICT Adoption

1.Job Creation
2. Education for all
3. Research & Development for more Productivity
4. Financial Inclusion
5. Improved value chain interaction
6. Social media connection (eg: LinkedIn)

Human Development, Economic Progress & Inclusive Growth

FIG 1: ICT Adoption and Inclusive Growth (Authors' Compilation)

Limitations and the Down-Side of ICT Adoption in West Africa
Certain factors limit and slow down the adoption of ICTs by West African countries. These factors among others are: Cost of Adoption, Level of Literacy and Language disparity, Low ICT Investment and Infrastructure, Low Electricity and Energy supply (a regular problem of most developing countries), Anti-globalisation mind-set. Information and Communication Technology has its advantages as well as disadvantages. Having highlighted the models, benefits and limitations, some of the backdrops of ICT adoption are: ICT or process automation threatens the availability of jobs, ICT creates room for organised criminal activities such as hacking and Cybercrime activities which could lead to Loss of huge amount of money due to online fraudulent activities, high cost of acquisition of some mobile technologies (Smart phones).

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The Empirical Model

The theory that underpins this research work is diffusion theory of innovation as initially enunciated by Everett Rogers (1962). The diffusion theory of innovation explains the process it takes a new idea or product (technology) to be adopted overtime. Diffusion of Innovation theory proposes that four elements influence the spread of a new idea: the innovation itself, communication channels, time and a social system. Rogers proposes that diffusion of innovation requires communication channel overtime among the participants in a social system. Rogers (2003) argues that diffusion is the process by which an innovation is communicated overtime among the participants of a social system. It explains patterns of adoption and predicts how unsuccessful or successful a technological innovation will be (Tan & Eze, 2008).

Diffusion of Innovation theory could be used for research and analysis purposes to know where technology adoption is most appropriate like in the case of education (Sahin, 2006). Triplett (1999) in a study tested and proved that technical innovations assist in an economy. The author discovered that there must be improvements in diffusion through Information Technology (IT) investment. ICT adoption is proposed as the communication channel for firms and institutions. This study adopts the Schumpeterian growth model for which the implicit function is seen as follows:

$$Y_t = f(A_I\,S_i\,X_i) -$$
$$\qquad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \qquad (1)$$

Where $A_{it} = MCS_{it}$

$\qquad S_{it} = RULE, PSE$

$\qquad X = GDPPCGR, CREDIT$

Where Y represents inclusive growth, A represents technology adoption; S represents socio-economic settings such as institutions - while X represents the endogenous growth components. Noting that the empirical model of Andres *et al* (2016) closely relates to the thesis of this study, the model includes some of their covariates and our main variables of interest. This study is interested in the relationship between mobile technology and inclusive growth. The main reason for the choice of co-variates is the fact that for human development to be achieved, institutions and other control variables in this model are to be present. The explicit form of the model is given as:

$$Y_{it} = \alpha_0 + \alpha_1 Y_{it-1} + \alpha_2 MCS_{it} + \alpha_3 PSE_{it} + \alpha_4 RULE_{it} + \alpha_5 CREDIT_{it} + \alpha_6 GDPPCGR_{it} + \mu_{it.} \quad -$$
$$- \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \qquad (2)$$

Where Y_{it} represents human development index which represents inclusive growth of country 'i' at time 't', MCS stands for number of mobile cell subscribers which is used as the ICT adoption variable to represent the technology (A); PSE_{it} represents primary school enrolment; $RULE_{it}$

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represents institution; $CREDIT_{it}$ represents domestic credit provided by financial sector; $GDPPCGR_{it}$ represents gross domestic product growth rate in the Schumpeterian growth model while Y_{t-1} represents the lagged dependent variable (to eliminate omitted variable bias).

The dependent variable, human development index is used as a proxy for inclusive growth. Consistent with recent African knowledge economy, (Tchamyou, 2015) and mobile technology is proxied by mobile sell subscription variable as in literature (Asongu, 2015).Primary school enrolment, institutions – rule (Binder, & Geogiadis, 2011) and credit are necessary control variables essential to the Schumpeterian growth model to capture human development.
Given that the variable of interest is the "number of mobile cell subscribers", the a-priori expectation states that its coefficient should have a positive sign. Meaning that, an increase in number of phone subscribers should account for a significant increase in human development, hence, $\alpha_2 > 0$.

Given the dynamic nature of the model (the addition of the lagged dependent variable in the model), to achieve estimates that are best, linear, unbiased and efficient (BLUE), address the issue of endogeneity and reverse causality, the generalised method of moments (GMM) technique was used.

Data Sources and Description
This study, with a view to achieving its objectives, utilises two major methods of analysis. They include descriptive and econometric techniques. The former employs charts and tables to assess the trend of mobile technology adoption and Inclusive growth in West Africa while, the econometric analysis employs the Generalised Method of Moments (GMM) technique to examine the relationship between mobile technology adoption and inclusive growth.

The variables identifier, the definition, the indicators, and a summary statistics and the source of data are presented in Table 1.

Table 1: **Variables Definition, Mean and Source of Data**

Data	Identifier	Data Source	Measurement
Inclusive Growth (proxied by Human development index)	HDI	UNDP, 2015	
Number of mobile cell subscribers	MCS	WDI, 2016	Number
Primary school enrolment (pupils) - female	PSE	WDI, 2016	Number
Institution	RULE	WGI, 2016	Constant US$
Domestic credit by financial institutions	CREDIT	WDI, 2016	
Gross Domestic Product per capita growth rate	GDPPCGR	WDI, 2016	

Source: Compiled by the Authors'

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EMPIRICAL RESULTS AND DISCUSSIONS

Patterns of Mobile Technology adoption and inclusive growth in West Africa

The 15 selected West African countries are Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Senegal and Togo. The variable used to represent inclusive growth is human development index while the data used to represent mobile phone technology adoption is the number of mobile cell subscribers. The data was sourced from United Nations Development Project (UNDP, 2015) World Development Indicators (WDI, 2016).

Mobile cellular subscribers are the total subscriptions to a public mobile telephone service (World Bank, 2016). Nigeria proves to be the giant of Africa in this case by having the largest number of mobile cellular subscribers – 9.15 million subscribers by 2004, 139 million by 2014; followed by Ghana – 1.69 million subscribers by 2004, 30.3 million subscribers by 2014; followed by Cote d'Iviore– 1.67 million subscribers by 2004, 22.1 million subscribers by 2014. The smallest countries in terms of Mobile Cell Phone Subscribers are Cape Verde– 65,780 Subscribers by 2004 and 616,378 subscribers by 2014. The values of mobile cellular subscriptions increased massively overtime, way higher than the total population due to people's preference to be subscribed to 2 or 3 different networks and service providers at the same time.
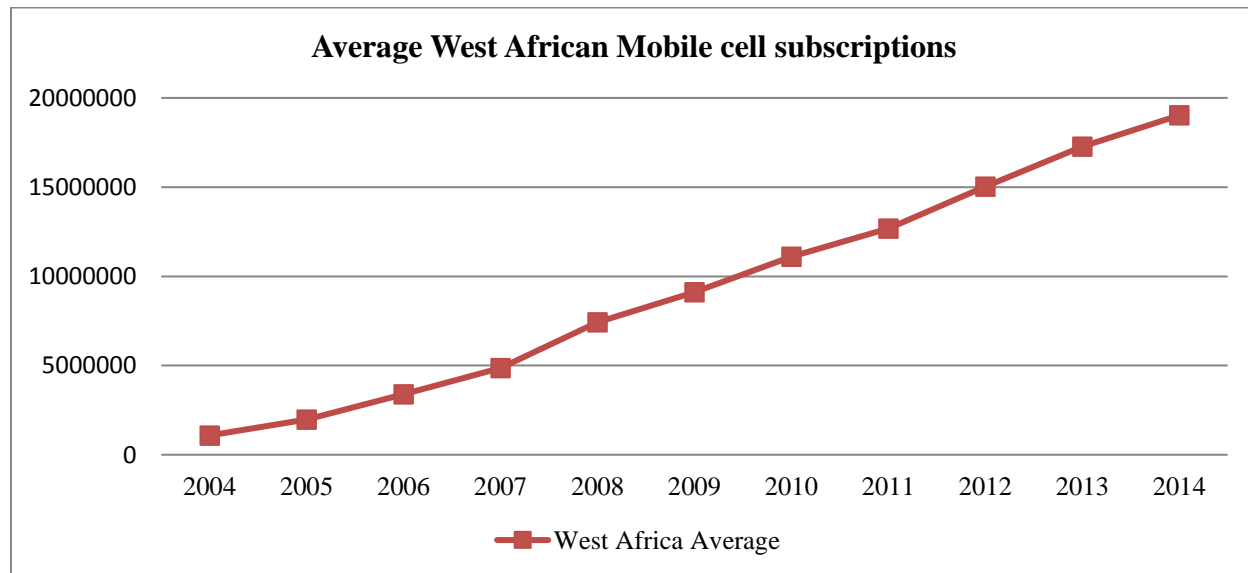

Figure 2: The Number of Mobile Cell Subscribers in West African Countries (Authors' computation using data from WDI (2016))
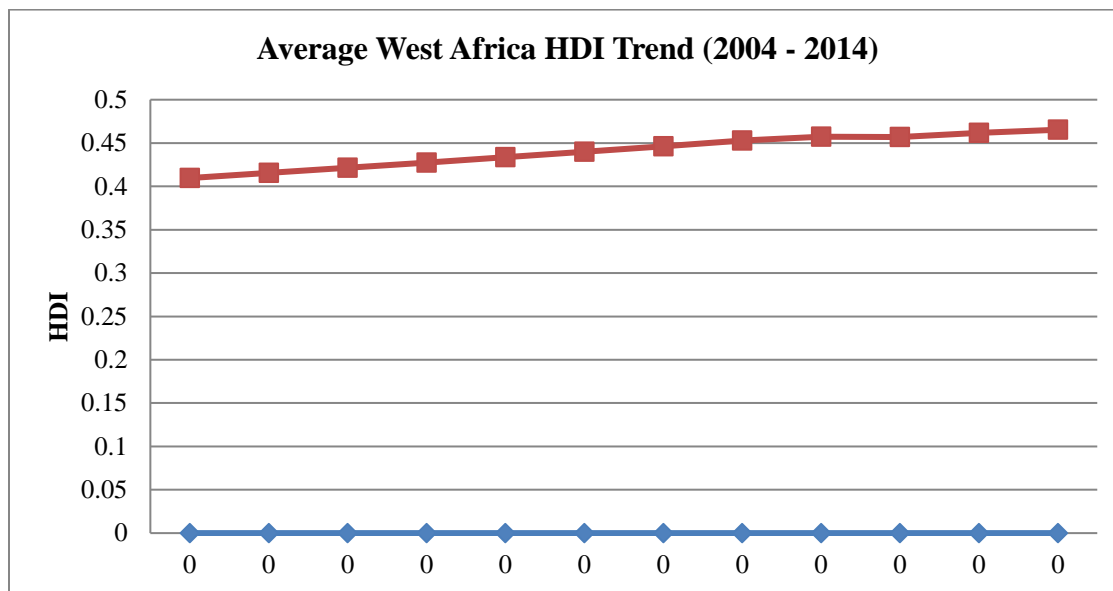
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FIG 3: West Africa HDI Trend (Authors' computation using data from WDI (2016))

Human development index (HDI) is a measure of human development which represents inclusive growth. It is a composite index which measures the average achievement in the three basic dimensions of human development – health, education and decent standard of living (UNDP, 2015). The values of the HDI lie between: 0.1 to 1.0.The higher the value of the HDI, the higher the human development in that country and vice versa.

The maximum and minimum values show that the human development index grew as high as 0.65 which was found in Cape Verde at 2014 and as low as 0.28 in Niger as at 2004. The trend of the average HDI for West Africa has been increasing almost consistently until it was interrupted in 2011 and remained at the same level till 2012 before it experienced a further increase.

Econometric Results

According to Baum (2013), the initial Arrelano – Bond (difference GMM) approach and its extension to the 'System GMM' context, is an estimator designed for situations with 'small T, large N' panels: few time periods and many individual units, a linear functional relationship, one left-hand variable that is dynamic - depending on its own past realizations, right-hand variables that are not strictly exogenous: correlated with past and possibly current realizations of the error, fixed individual effects, implying unobserved heterogeneity, Heteroscedasticity and autocorrelation within individual units' errors, but not across. Given the dynamic nature of the datasets, the GMM estimator caters for the possible problems usually associated with such type of data.

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The necessary condition for the interpretation of the GMM results is to examine the AR (1) and AR (2), the Sargan test statistics and to compare the number of instruments against the number of groups. The Sargan test checks for the validity of the internal instruments that was used in the SGMM. From the results below, the p-value of the Sargan test for the results satisfy the rule of thumb that at 5% level of significance ((P-value> 0.05), the instruments are valid and were not over-identified. AR (1) and AR (2) tests for the presence of autocorrelation of the first order and second order. Given that the value of the AR (1) and AR (2) of the model in this study is not statistically significant (> 0.05), there is absence of autocorrelation of the first order and second order. In terms of the comparison of the number of instruments against the number of groups, the rule of thumb says that the number of groups should be higher than the number of instruments. The number of groups are higher that the number of instruments for the three result columns. Therefore, this confirmation renders the result from this study relevant and reliable for inference. Focusing on mobile technology adoption in West African countries, the variable is insignificant using the GMM estimator (i.e. Columns 1, 2 & 3), This goes against the apriori expectation that an improvement in mobile technology adoption is a contributes significantly to human development inclusive growth of countries in West Africa. However, the apriori expectation is correct because the usage of mobile technology and internet enables increased efficiency overtime, helps to solve problems through various methods across physical barriers at a very short time. From the results, a unit increase in mobile technology adoption explains a -1.30 or -9.70 or -6.52 (negative) increase in inclusive growth. Hence, the results from the GMM are found in table 4.1.

Factors that could account for negative impact of mobile technology adoption on inclusive growth as found by the study are the high cost of acquisition of the technology in West Africa, the usage of these technologies for non-economically productive reasons by the populace (which could be due to ignorance), low investment in research and ICT development funds as well as low general investment in telecommunications industry and the low penetration of these technologies enough to positively affect inclusive growth.

Table 2: SGMM RESULTS (Dependent variable: Inclusive Growth)

Inclusive Growth(-1)	0.96*	1.04*	1.00*
	(0.00)	(0.00)	(0.00)
Mobile cell subscription	-1.30	-9.70	-6.52
	(0.99)	(0.29)	(0.36)
Primary school enrolment	-.0003	-.0004	-.0004
	(0.26)	(0.29)	(0.57)
Rule of law (Institution)	-.0021	-.0034	-.0014
	(0.74)	(0.40)	(0.72)

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Domestic credit provided by financial sector	-.00006	-.0000	.000017
	(0.48)	(0.78)	(0.77)
GDP per capita growth rate	0.00021	0.0004**	.00034
	(0.74)	(0.02)	(0.10)
Constant	-.0081	0.023	0.01
	(0.75)	(0.11)	(0.12)
AR (1)Pr	0.379	-0.39	0.08
AR (2)	0.361	1.49	0.12
Sargan Test	0.154	0.74	0.42
Prob> F	(0.000)	(0.000)	(0.000)
Number of instruments	8	8	10
Number of groups	15	15	15

Note: The values in the parenthesis '()' are the probability values
*and ** denotes that the coefficients are significant at 1% and 5%, respectively. (Authors Compilation)

The mechanism through which mobile technology could lead to inclusive growth is firstly, through spontaneous information dissemination. The transmission is initiated from the various theories (reasons) on how and why a new technology is adopted by an individual, firm, country- in this case; mobile phone technology is then utilised by the population to reduce the information asymmetry (information) variance between the different users at the various sides (supply and demand) of each value chain that exists in all the sectors and markets in an economy. Secondly, access to mobile technology reduces transaction costs associated with the markets (i.e. savings in time and travel) and assist in the expansion of market boundaries (Aker & Fafchamps, 2010; Asongu *et al.,* 2016).

These in turn will increase productivity overtime economic growth, and therefore, inclusive growth. Inclusive growth is achieved through the increased participation of the labour force in the various economic activities; which is in line with the definition of Inclusive growth; that is, creating equal opportunities for all in an economy. This transmission pass - through could be applied to the labour market, capital market, all sectors of the economy including education sector, health sector, agriculture sector, and so on.

ICTs are at the forefront of many innovative activities occurring in West Africa (Asongu *et al.*, 2016) such activities include M-pesa in Kenya and other African countries (Kirui *et al*., 2013; Singh, 2012); empowerment of women (Maurer, 2008; Ojo *et al*., 2012); consolidation of health services (Kliner *et al*., 2013); household management efficiency (Al Surikhi, 2012); bridging of the rural-urban (Chan & Jia, 2011; Qiang *et al*., 2011); enhancement of household opportunities for business (Mishra & Bisht, 2013; Ondiege, 2010) and elimination of wastes in agriculture as well as supply- and demand-side obstacles (Aker & Fafchamps, 2010; Muto & Yamano, 2009).

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Mobile technology adoption needs to be complemented with internet penetration and innovation (Asongu *et al*, 2016).

CONCLUSION

This study was motivated by the debate on the role of mobile technology as a significant contributor to inclusive growth and it provides an empirical investigation on the effects of mobile technology on inclusive growth for the period 2004 to 2014. This is deemed crucial based on the fact that slow level of adoption of ICT witnessed in some West African countries while some others experience fast levels of adoption of ICTs such as mobile technologies (mobile cell subscription, smart phones, and so on). It argues that an improvement in mobile technologies in the member countries will provide one of the required structures that will increase inclusive growth. To achieve the stated objective, the study engages econometric analysis which utilises the generalised methods of moments (GMM) technique. A number of findings are made and the major ones are summarised herein.

Most of the West African countries do not produce such technologies (despite the fact that West Africans are talented in terms of brain and man power), the cost of acquisition of some mobile technologies seems to be very high which could be due to factors common to most West African countries such as increasing inflationary rates, low exchange rates, and so on. Thus, efforts and policies such as increased investments in Telecommunications Industry and other related industries, rendering of tax holidays to encourage the local production of such technologies within West Africa will be laudable in enhancing inclusive growth as it will help to diversify the export content of West African countries, provide employment, reduce brain drain syndrome and intensify the penetration as well as competitiveness of their products.

Mobile technology adoption (complemented with internet facilities, internet enabled applications) is a significant determinant of human development and inclusive growth in West African countries, therefore, it is recommended that the use of cutting edge information and communication technology facilities should be encouraged and enforced by private and public companies, institutions offering health care services, education services, agriculture, and financial services to improve efficiency by reaching out to far distances to increase coverage for everyone overtime.

As a suggestion for further research, it will be expedient to complement this study using other components of mobile technology (such as smart phones), internet adoption and their relationship with inclusive growth, use other variables to represent inclusive growth. It is also recommended that further studies examine the role of mobile technology adoption in influencing inclusive growth in sub continents, continents, countries, regional economic communities in Africa and beyond with a view to comparing their experiences with that of West Africa.

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Appendix
Table A1: Average of the Number of Mobile Cell Subscribers in West African countries

MCS	2004 - 2006	2007 - 2009	2010 – 2012	2013 - 2014
Benin	703.77	3,570.16	7,749.32	9,143.94
Burkina Faso	682.03	2,901.94	7,788.69	11,867.64
Cape-Verde	85.45	240.17	397.87	556.42
Cote d'Ivoire	2,696.40	10,367.02	17,014.27	20,747.74
Ghana	3,258.93	11,427.80	21,407.07	29,193.63
Guinea	171.95	2,746.33	4,815.10	8,059.99
Guinea Bissau	98.54	452.24	819.73	1,024.10
Liberia	178.12	834.23	1,990.62	2,888.02
Mali	893.93	3,476.67	10,958.38	21,627.47
Mauritania	776.05	1,896.07	3,372.10	3,870.76
Niger	326.43	1,798.88	4,602.35	7,621.35
Nigeria	20,018.80	59,300.79	98,414.29	133,103.21
Sierra Leone	0.00	981.60	2,115.67	4,378.40
Senegal	1,944.68	5,307.14	9,722.41	13,756.75
Togo	491.40	1,642.40	2,869.95	4,389.55
WA Average	2,309.03	7,129.56	12,935.85	18,148.60

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