

Role of Information and Communication Technology Applications on Financial Inclusion in Kenya

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Abstract: In recent years, there has been a rapid diffusion of information and communication technologies (ICT) in African countries, in line with similar patterns in other regions of the developing world. Some studies have observed that the economic and social return of ICT development is larger than the private return of the network provider. Major technological development in the banking system is Core Banking System (CBS), which provides anytime, anywhere banking facilities. Other developments include electronic payment systems such as the Real Time Gross Settlement System (RTGS), National Electronic Funds Transfer (NEFT), National Electronic Clearing Service (NECS), Immediate Payments Service (IMPS), Aadhaar Enabled Payment Systems (AEPS), etc. Banks are increasingly using alternate channels of delivery. Specifically, the study was guided by the following objectives: to establish the role of mobile banking on financial inclusion in Kenya, to determine the role of agent banking on financial inclusion in Kenya, to assess the role of internet banking on financial inclusion in Kenya and to find out the role of table banking on financial inclusion in Kenya. The research design was a case study of special interest groups in Kenya on financial inclusion. The target population was 3000 people. Questionnaires were used for data collection. This study produced both quantitative and qualitative data. Once the questionnaires are received, they were coded and edited for completeness and consistency. Quantitative data was analyzed by employing descriptive statistics and inferential analysis using statistical package for social science (SPSS) version 24. The data was then presented using frequency distribution tables, bar charts and pie charts for easier understanding. The findings showed that mobile banking has a positive and significant effect on the financial inclusion of special interest groups, $\beta_1 = 0.396$, $p\text{-value} = 0.000$. Agent banking has a positive and significant effect on the financial inclusion of special interest groups, $\beta_2 = 0.334$, $p\text{-value} = 0.000$. Internet banking has a positive and significant effect on the financial inclusion of special interest groups, $\beta_3 = 0.142$, $p\text{-value} = 0.013$ while table banking has a positive and significant effect on the financial inclusion of special interest groups, $\beta_4 = 0.289$, $p\text{-value} = 0.000$. There were gaps that were identified that would result in the curtailing of these positives.

Keywords: Mobile banking, Agent banking, Internet banking, Table banking, financial inclusion.

1. INTRODUCTION

Recent studies have shown globally, 2 billion adults remain unbanked. South Asia, East Asia, and the Pacific account for more than half the world's unbanked adult [5]. This position, however, according to the Global Findex database, is an improvement. Between 2011 and 2014, 700 million adults worldwide became account holders thereby decreasing the unbanked population by 20 percent to the current 2 billion [5]. The increase in financially included population was concentrated in financial institution accounts everywhere in the globe except Sub-Saharan Africa, where mobile money accounts drove the growth in overall account penetration from 24 percent in 2011 to 34 percent in 2014. Africa is the world's second-largest continent covering about over 30 million square kilometers. The continent has the largest reserves of precious metals with over 40% of the gold reserves, over 60% of the cobalt, and 90% of the platinum reserves. Over 55% of Africa's labor force working in food production with vast areas of arable and pastoral lands supporting agricultural economies. African countries experienced positive developments in access to financial services in recent

decades. In many African countries with the deepening of the financial sector, more financial services, especially credit, is now provided to individuals and enterprises. Similarly, new technologies such as mobile money help broaden access to financial services, including savings and payment products.

However, the financial systems of many African countries remain under-developed as compared to other developing economies even though most of these countries have undergone extensive financial sector reforms in the last two decades. Indicators of the use of financial products and services by adults and enterprises in the region show that many challenges remain toward building a more financially inclusive financial sector in Africa [5]. Over the last decade, financial inclusion (inducing the bank habit to the underserved population) has made its way into the center stage of development policy. Microfinance success stories, driven by the Grameen Bank, have led to an unusual convergence of interests between governments, businesses, official aid agencies, philanthropists and civil society. Underlying this consensus is a belief that access to financial services is a powerful means of reducing poverty.

2. EMPIRICAL REVIEW

Earlier cross-country studies found a positive and significant impact of telecommunication infrastructure on economic growth. For instance, [4] analyzes the impact of telecom penetration. He finds that the impact of radio rollout on economic growth is not statistically significant, in contrast to the impact of the telephone. Two-way networks (telecommunications) are more important for growth than one-way networks (broadcasting) such as radio and television. Although [4] uses previous-year values of radio penetration and telephone penetration to account roughly for reverse causality, he did not control for country-specific effects. Although there is consensus on how financial inclusion is defined, there is no standard method by which it can be measured. Consequently, existing studies offer varying measures of financial inclusion. For instance, [6] constructed a financial access indicator which captures the fraction of the adult population in a given economy with access to formal financial intermediaries. The composite financial access indicator was constructed using household survey data for economies with available data on financial access. For those without household survey on financial access, the indicator was derived using information on bank account numbers and GDP per capita.

Similarly, [3] found that increased financial access through commitment saving account in rural Malawi improves the well-being of poor households as it provides access to their savings for agricultural input use [1] found that by tapping underprivileged households, commercial banks can help improve financial access of the poor in Kenya. Unlike [6] constructed a financial access indicator for 160 economies that combines both household survey datasets and published financial institutions data into a composite indicator; and assessed country characteristics that might influence financial access. Among the variables tested, aid as a percent of gross national income (GNI), age dependency ratio, and population density significantly lower financial access; while mobile phone subscription and quality of institutions significantly increase financial access. Looking at the cross-country link between poverty and financial access, his results show that financial access significantly reduces poverty, but the result is valid only when financial access is the sole regressor, i.e., it loses significance when other variables are added as regressors.

In an earlier version of his paper, [6] tested the significance of his financial access indicator in reducing income equality. His results show that higher financial access significantly reduces income inequality as measured by the Gini coefficient. However, the link between the two variables depends on which specification is used, i.e., when the access variable is included on its own and includes financial depth measure, the results are significant, but the same does not hold when per capita income and dummy variables are included. However, unlike the estimation of [6], The issue of reverse causality comes up because better communication systems may bring higher incomes, and higher wages, in turn, could lead to better communication systems.

In developing countries, mobile phones are substitutes for fixed lines; in developed countries, they are complements for fixed lines. Their impacts on growth are positive and significant -twice as large as their impacts in developed countries. The starting hypothesis is that mobile phone rollout has greater effects on economic growth in developing countries because mobiles have more network effects and have more effects on mobility than in developed countries. They also find that the price and income elasticities of mobile phone demand are superior to 1 in developing countries

Using a modified version of), they estimate a structural model with three equations for 19 Indian states from 2000 to 2008. They specifically examine the links through which mobile phones affect growth and the constraints, if any, that limit their impact. They find that Indian states with higher mobile penetration rates can be expected to grow faster and

that there is a critical mass, at a penetration rate of 25 percent, beyond which the impact of mobile phones on growth is amplified by network effects. Telecom networks, more than any other infrastructure, are subject to network effects: the growth impact is larger when a significant threshold network size is achieved.

3. CONCEPTUAL FRAMEWORK

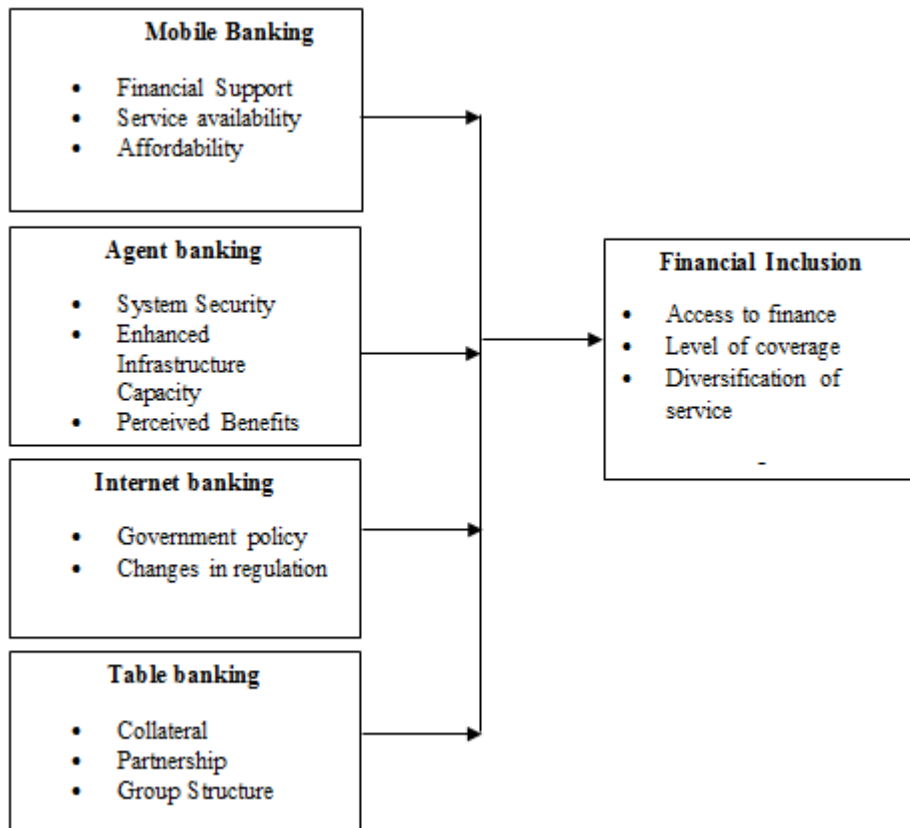


FIGURE 1: CONCEPTUAL FRAMEWORK (AUTHOR, 2016)

4. SUMMARY AND CRITIQUE OF EXISTING LITERATURE

Agent banking is an additional delivery channel that can enhance the convenience and outreach of quality and affordable financial services particularly to the underserved in a more cost-efficient manner. Agent banking provides a cheaper alternative for financial institutions to reach out to the underserved populations. However, delivery via this channel, if not appropriately managed, can also potentially increase the risk profile of financial institution as a result of dependence on third parties, and may be disadvantaged to customers [7]. Financial institutions, therefore, are required to effectively manage the risks associated with agent banking through the adoption of sound and prudent risk management practices. Many people are financially excluded because of various reasons like lack of information, insufficient documentation, lack of access and illiteracy [2]. So the main objectives of the financial inclusion should take care of all the above problems with the help of ICTs.

Information technology (IT) has transformed the way the banks do business. Banks are leveraging on technology not only to cut costs but also to reduce the transaction time and overall efficiency. No bank no matter, the location or scale can ignore information technology. It has become inevitable for the survival of any bank. Apparently, the application of IT in banks has transformed the traditional banking industry, from being a highly protected governmental agency with a limited scope of activities in the defined territorial boundaries, into an independent and open industry, providing a wide range of financial and banking services in a competitive environment on a global scale [8]. The concepts of face-to-face banking and branch banking have given way to the new age concepts like core banking, electronic banking, telebanking, mobile banking, global international banking, anywhere banking, virtual banking, electronic fund transfers and so on [10]. Further, IT has also enabled the banks to offer wide portfolio of banking and financial services ranging from loans and

deposits to investment advice, portfolio management, investment banking, foreign exchange banking, wealth management, Insurance and so on, using several alternative channels of serving the customers across the globe, [9]. There are several barriers to financial inclusion; some are characteristics of service providers and some are of customers.

The following are the characteristics of financial providers which lead to financial exclusion. There are no bank branches in remote areas, and difficulties result in closure/mergers/shifting of bank branches which operated in tribal areas/ remote rural areas. Infrastructure in the form of road, rail, technology and adequate power is very much important for the operation of the bank. But in many parts of the country, the infrastructure is not adequate especially in rural parts of Kenya. Bank-timings are inconvenient for the poor people as they have to go for farm operations in the fore-noon [2]. Visiting branch during daytime causes loss of the day's wage. Personal identification, minimum balance technologies adopted by bank limits the number of people able to have an account and maintain it and normally rural people do not get any letter of introduction which is essential to open an account and due to lack of literacy they are unable to access most financial institutions.

To summarize, ICT can influence economic growth through various channels, even though the causal link may be difficult to establish. ICT development generates employment and government revenues. ICT also allow better information flows, leading to increased efficiency, wider markets, increased productivity, and new capital and investments such as FDI and portfolio and venture capital. ICT can also lead to better financial inclusion and therefore facilitate financial development. To our knowledge, this link has not been studied before. It is important, therefore, to investigate it, considering that financial development in Kenya is low whereas ICT penetration, through mobile phone rollouts, is growing fast.

5. RESEARCH METHODOLOGY

The research design was a descriptive research design. The target population of interest in this study consisted of special interest groups within Nairobi City County. The target population was 3000 people. From the target population of 3000, a sample size of 5% was taken, giving a respondent base of 150 respondents. A sample frame for this study included the people with disabilities, youth, women and the aged. To carry out this study, a structured questionnaire was developed and pre-tested. It contains both open and close-ended questions. Questionnaires were administered through the drop and picked. A total of 10 respondents were used for piloting. This study is expected to produce both quantitative and qualitative data. Once the questionnaires are received, they were coded and edited for completeness and consistency. Quantitative data were analyzed by employing descriptive statistics and inferential analysis using statistical package for social science (SPSS version 24).

6. RESULTS AND DISCUSSION

Mobile Banking:

The findings showed that 47 (31) and 54 (36%) representing 67% of the responses respectively agreed and strongly agreed that the cost of the mobile banking service is reasonable and affordable. The findings also showed that 25 (17%) and 52 (35%) of the respondents respectively agreed and strongly agreed that the service was secure representing 52% of the responses. The findings also showed that 61 (41%) and 21 (14%) respectively agreed and strongly agreed that the service supports most of the wireless carriers representing 56% of the responses. The findings also showed that 43 (29%) and 40 (27%) of the respondents respectively agreed and strongly agreed that the mobile service is available for special interest groups representing 56% of the responses. Also, 73 (49%) and 36 (24%) of the respondents respectively agreed and strongly agreed that the mobile banking transactions are processed immediately representing 73% of the responses. Finally, 41 (27%) and 17 (11%) of the respondents respectively agreed and strongly agreed that it is easy to install the downloadable application representing 38% of the responses.

Agency Banking:

The findings showed that 67 (45%) and 8 (5%) of the respondents indicated that to a large extent and a very large extent respectively representing 50% of the responses, they get a lot of revenue since inception of agency banking while 59 (39%) and 16 (11%) of the respondents respectively thought that it was to a moderate and small extent respectively. Furthermore, 45 (30%) and 16 (11%) of the respondents respectively indicated that to a large extent and a very large extent, they had won clients over their competitors representing 41% of the responses. Also, 70 (47%) and 35 (23%) of

the respondents respectively were of the view that to a large extent and very large extent the agents were friendly and courteous representing 70% of the responses. The findings also showed that 55 (37%) and 50 (33%) of the respondents respectively indicated that to a large and very large extent, they have strong credit skills which represented 70% of the responses. Furthermore, 59 (39%) and 74 (49%) of the respondents respectively indicated that to a large and very large extent, their agency covers special interest groups representing 88% of the responses. Finally, 64 (43%) and 55 (37%) respectively indicated that to a large and very large extent, they offer fast and efficient services representing 80% of the responses.

Internet Banking:

The findings showed that 89 (59%), 48 (32%) and 13 (9%) of the respondents respectively indicated that to a moderate, large and very large extent, they are likely to use internet banking again in the near future representing 100% of the responses showing that the future of internet banking was promising among special interest groups. The findings also revealed that 62 (41%) and 61 (41%) respectively indicated that to a small and moderate extent, generally, they are satisfied with their most recent experience with internet banking while 24 (16%) and 2 (1%) indicated that it was to a large and very large extent respectively. Also, 69 (46%) and 57 (38%) of the respondents respectively indicated that to a moderate and large extent, they were satisfied with the accuracy of transactions. Furthermore, the findings also revealed that 33 (22%) and 42 (28%) respectively indicated that to a small and moderate extent, online banking is safe while 11 (7%) indicated that it was to a very large extent. The findings also showed that 68 (45%) and 44 (29%) of the respondents respectively indicated that to a large and very large extent, computer-based technologies greatly enhance the computing and telecommunication possibilities while 19 (13%) respectively indicated that it was to a small and moderate extent. Finally, the findings also showed that 59 (39%) and 65 (43%) of the respondents indicated that to a moderate and large extent respectively, internet banking could grow to special interest groups in awareness in improved.

Table Banking:

The findings revealed that 62 (41%) and 58 (39%) of the respondents indicated that increased access to financial services for underserved people helping them to narrow the financial infrastructure gap to a moderate and large extent respectively. Furthermore, the findings revealed that 58 (39%) and 60 (40%) of the respondents indicated that table banking gives high priority to those without to improve their financial status to a moderate and large extent respectively. The findings also showed that 60 (40%) and 59 (39%) of the respondents indicated that table banking groups had become lately a source of capital for entrepreneurs since their interest rates are friendly and easily accessible compared to banks and micro-finance institutions. Finally, the findings also showed that 42 (28%) and 56 (37%) of the respondents indicated that poor women are the ones making the majority of table banking groups in the country to a large and very large extent respectively.

Financial Inclusion:

The findings in Table 4.6 showed that 78 (52%) and 52 (35%) of the respondents respectively agreed and strongly agreed that capital Investment has increased over the years representing 87% of the responses. The findings also showed that 32 (21%) and 52 (35%) of the respondents respectively agreed and strongly agreed that sales volume has increased over the years representing 56% of the responses. Furthermore, the study findings showed that 63 (42%) and 60 (40%) of the respondents respectively agreed and strongly agreed that customers have increased over the years representing 82% of the responses. The findings also showed that 84 (56%) and 52 (35%) of the respondents agreed and strongly agreed respectively that they had opened other outlets since they started representing 91% of the responses. Also, 72 (48%) and 38 (25%) of the respondents respectively agreed and strongly agreed that they have plans to open other businesses representing 73% of the responses. The findings also showed that 57 (38%) and 51 (34%) of the respondents respectively agreed and strongly agreed they made profits after deducting other expenses each year for the last three years representing 72% of the responses. The findings also revealed that 63 (42%) and 60 (40%) of the respondents agreed and strongly agreed respectively that they depend wholly on revenue generated to sustain the business representing 82% of the responses. Furthermore, 84 (56%) and 36 (24%) of the respondents agreed and strongly agreed respectively that new job openings had been created representing 80% of the responses. Finally, 72 (48%) and 38 (25%) of the respondents agreed and strongly agreed respectively that there is increase business support from other stakeholders over the years representing 83% of the responses.

Correlation Analysis:

The study thus carried out correlation analysis of the independent factors and the dependent factor and the findings were summarized and presented the correlation matrix in Table 6.1.

		Mobile Banking	Agency Banking	Internet Banking	Table Banking
Agency Banking	Pearson Correlation	0.068			
	Sig. (2-tailed)	0.407			
Internet Banking	Pearson Correlation	0.048	0.082		
	Sig. (2-tailed)	0.559	0.320		
Table Banking	Pearson Correlation	0.281**	0.390**	0.025	
	Sig. (2-tailed)	0.001	0.000	0.764	
Financial Inclusion	Pearson Correlation	0.506**	0.486**	0.196*	0.534**
	Sig. (2-tailed)	0.000	0.000	0.016	0.000
** Correlation is significant at the 0.01 level (2-tailed).					
* Correlation is significant at the 0.05 level (2-tailed).					

From the findings in Table 6.1, mobile banking has a positive and significant relationship with the financial inclusion of special interest groups ($r = 0.506$, $p\text{-value} = 0.000$) at 0.01 level of significance. This implies that there is a probability of 0.506 that the financial inclusion of special interest groups will increase with an increase in mobile banking.

Regression Analysis:

According to Table 6.2, the R-value indicates a relatively strong correlation between predictor variables and the response variable (financial inclusion). This is because the R-value is positive (0.738). This means that the variation in the growth was attributed to 73.8% change in the predictor variables. According to the value of the R-Square, 54.5% of the financial inclusion of special interest groups could be explained by independent variables of mobile banking, agency banking, internet banking and table banking. Therefore independent variables would have a 54.5% influence on the financial inclusion while the remaining 45.5% could be attributed to other factors other than predictor variables.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.738a	0.545	0.532	0.468

a Predictors: (Constant), Table Banking, Internet Banking, Mobile Banking, Agency Banking

7. CONCLUSION

The study findings regarding the perspectives of the respondents on mobile banking showed that mobile banking is affordable, secure, supports various wireless carriers, is available to special interest groups and enables the processing of transactions immediately for the majority of the special interest groups members. The findings on agency banking based on the perspectives of the respondents revealed that 50% of respondents were of the view that they get a lot of revenue since the inception of agency banking. Also, 41% of the respondents indicated that they had won clients over their competitors because of agency banking while 70% indicated that agency banking was friendly and courteous. The findings also showed that 70% of the respondents indicated that they have strong credit skills. Furthermore, 88% of the respondents indicated that their agency covers special interest groups while 80% of them indicated that they offer fast and efficient services.

The study findings regarding internet banking revealed that all the respondents indicated that they were likely to use internet banking again shortly indicating the potential growth of this form of banking technology. Furthermore, although it was not to a large extent, 82% of the respondents indicated to some level that they are satisfied with their most recent experience with internet banking indicating that there were some reservations regarding this service to some of the special interest group members. Also, 84% of the respondents were satisfied with the accuracy of transactions although some indicated a lower level of satisfaction showing the existence of some gaps that need to be addressed. Although this was

the case, 74% of the respondents were of the view that computer-based technologies greatly enhance the computing and telecommunication possibilities while 82% of them highlighted the need to create awareness among the special interest groups to increase internet banking. The findings also showed that internet banking has a positive effect on the financial inclusion of special interest groups and would have a 0.142 unit incremental effect.

The findings regarding table banking indicated that 80% of the respondents indicated in general that increased access to financial services for underserved people helps narrow the financial infrastructure gap. Furthermore, 79% of the respondents indicated that table banking gives high priority to those without to improve their financial status showing the focus on the special interest groups to improve their capacities. Also, 79% of the respondents indicated that table banking groups had become lately a source of capital for entrepreneurs since their interest rates are very friendly and easily accessible compared to banks and micro-finance while 65% indicated that poor women are the ones making the majority of table banking groups in the country. The findings also showed that table banking has a positive effect of 0.289 units on the financial inclusion of special interest groups.

The primary objective of the study was to determine the role of ICT in financial inclusion in Kenya. In order to aid in the achievement of this objective, the following specific objectives were sought: to establish the role of mobile banking on financial inclusion in Kenya, to determine the role of agent banking on financial inclusion in Kenya, to assess the role of internet banking on financial inclusion in Kenya and to find out the role of table banking on financial inclusion in Kenya. These objectives formed the research questions to be addressed about ICT and financial inclusion. Although the findings have shown that ICT have positive effects on financial inclusion of special interest groups, some gaps were identified that would result in the curtailing of these positives. Issues related to the lack of awareness of ICT, illiteracy were brought up. These would result in slow progress if allowed to persist.

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