

Factors Affecting the Adoption of Mobile Banking by Deposit Taking Sacco's in Kenya

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Abstract: *Mobile money providers have partnered with commercial banks in Kenya to offer mobile based financial products that aim to reach the unbanked. However, as compared to commercial banks in Kenya, the penetration of M-banking in SACCOs has been very slow. The purpose of this study was to assess factors affecting adoption of mobile banking services in Kenya. The study sought to find out the affect capital adequacy and cost of innovation on adoption of Mobile Banking in Sacco's in Kenya. A descriptive research design was adopted. The target population was 18 SACCOs operating FOSA (Front Office Savings Activity) in Kenya, Kiambu County. The study used secondary data from the financial statement of this Saccos. The finding of the study revealed that capital adequacy and cost of innovation have a positive and statistically significant effect on the adoption of mobile banking. The study recommends that the management of Sacco's in Kenya to invest more on adoption of mobile banking in Sacco's through their annual budgetary allocation, as this would lead to more customers hence profitability. The study further recommends that Sacco's should put emphasis on capital adequacy and cost of innovation as they were found to significantly affect adoption of mobile banking.*

Keywords: capital adequacy, Cost of innovation and M-Banking adoption

1. Introduction

Technology has greatly advanced playing a major role in improving the standards of service delivery in the financial institution sector (Keli, 2012). Days are long gone when customers would queue in the banking halls waiting to pay their utility bills, school fees or any other financial transactions. They can now do this at their convenience by using their phones or over the internet from the comfort of their homes. Today, banks have welcomed wireless and mobile technology into their boardroom to offer their customers the freedom to pay bills, planning payments and many other services while stuck in traffic or while moving about. More people than ever are banking on the move rather than visiting bank offices. E-payment done by mobile banking (M-banking) is rapidly becoming one of the latest trends of e-banking (Okiro and Ndungu, 2013). During the 21st century, mobile banking advanced from providing mere text messaging services to that of internet banking where customers do not only view their balances and set up multiple types of alerts but also transact other activities such as fund transfers, redeem loyalty coupons, deposit cheques via the mobile phone and instruct payroll based transactions (Tobbin, 2012).

There are different factors which play a vital role in the adoption of these relatively new services Wunderlich et al. (2014). These factors could be social, economic or technological. Some of the social factors identified include conceptualizing electronic money, the social context of transactions, awareness, attitude towards change (embracing new technology), trust in one's bank or service provider, convenience of the service and the comfort that people have in using these services. Economic factors include mobile phone access, cost of the service, marketing strategies, implementation cost and availability of alternatives.

In Kenya, adoption of M-banking services is still very low. M-banking promises a lot more to the users, including

interest on funds saved, credit history and access to loans. This leads to questioning the banking sector as to whether the un-banked user has been well understood (Demombynes and Thegeya, 2012). Mobile networks in Kenya offer m-money services in the name of M-pesa by Safaricom, Orange money by Orange, Yu-cash by Essar, and Airtel money by Airtel. Currently the mobile money market size is about 15 million users transferring Kshs. 2 billion daily, of these over 14 million are Mpesa customers. There has since been a rapid growth in the adoption of mobile banking by the commercial banks in Kenya in recent years, evidenced by the numerous advertisements in the media on the various mobile banking services being offered by these banks (Maina, 2012). For instance, Some of the services being offered include transfer of funds from bank account to mobile phone account like M-Pesa, airtime top-up, change of mobile banking PIN, banking services like account inquiry which includes balance inquiry and mini statement inquiry, funds transfer between accounts both own and other people's accounts, cheque book request, bill payment and viewing linked accounts, application of soft loans just but to mention a few (Owen, 2009).

The terms m-banking, m-payments, m-transfers, m-payments, and m-finance refer collectively to a set of applications that enable people to use their mobile telephones to manipulate their bank accounts, store value in an account linked to their handsets, transfer funds, m-banking or even access credit or insurance products (Imetur, 2012).

The Sacco sub sector comprises both Deposit Taking and non-Deposit Taking Sacco's. Deposit Taking Sacco's are licensed and regulated by SASRA while non-Deposit Taking Sacco's are supervised by the Commissioner for Co-operatives. SASRA licenses Sacco's that have been duly registered under the Cooperative Societies Act CAP 490. As at 31st December 2011, the total number of Deposit Taking Sacco's was 215 of which 110 had been licensed. 105 Sacco's were at various stages of analysis and processing. It

should be noted that these Deposit Taking Sacco's were in operation prior to establishment of SASRA in 2009 and have applied to be considered for licensing as Deposit Taking business. The Deposit Taking Sacco's that are spread across the Counties are distributed as follows:-Government based Sacco's 87, Farmers based Sacco's 74, Private institutions based Sacco's 24, and Community based Sacco's 30. Section 69 of the Sacco Societies Act provided one year from the date of publication of the Regulations for all the Deposit Taking (FOSA operating) Sacco's to apply for license. This period lapsed in June 2011 by which date 200 Sacco societies had submitted their applications for license with SASRA. The balance of eighteen (18) Sacco societies discontinued or closed the Deposit Taking Sacco business as they did not satisfy the licensing requirements.

These Sacco's reverted to the operations the Back Office Service Activity (BOSA) referred to in the Act as non-Deposit Taking Sacco business since they do not collect demand deposits from members. The supervision of BOSA Sacco societies remains under the Cooperative Societies Act, Cap 490 administered by the Commissioner for Cooperative Development.

1.1 Statement of the Problem

Mobile banking has led to financial deepening. Financial deepening plays an important role in reducing risk and vulnerability for disadvantaged groups, and increasing the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction (Pozzebbon, Mackrell and Nielsen, 2014). Mobile banking is causing a flurry of activity in the world's financial services industry. In fact, it is leapfrogging traditional banking and now many top banks are up and running with their own mobile banking solutions, trying to take advantage of technology that comes with mobile phones and introduce the service as a means of providing fast and efficient services, reduced cost of operation and setting of infrastructure.

The foregoing discussion shows that the earlier studies established that many developed countries have embraced mobile banking hence enabling people to seek services such as viewing account balances, making transfers between accounts, or paying bills via a mobile device such as a mobile phone (Demombynes and Thegeya, (2012). The statistics at the ministry of information and communication shows that there has been exponential growth of the mobile subscribers which increased to 28.08 million up from 26.49 million in the year 2012 which is a 5.99% increase.

Currently the mobile money market size is about 15 million users transferring Kshs. 2 billion daily, of these over 14 million are Mpesa customers. M-money providers have partnered in the banking industry with commercial banks having the highest number of adoption followed by Sacco's. However, as compared to commercial banks in Kenya, the penetration of M-banking in the Sacco industry has been very slow (Tobbin, 2012). Banks and Saccos are regulated by different institutions and operate under different structures. Sacco's are supervised and regulated by SASRA while banks are supervised and regulated by the Central

Bank of Kenya. According to Mbogo (2010) the cost of running deposit taking SACCOs (FOSAs) is set to go up significantly with the new set regulations in effect threatening the low interest rates regimes that for decades have given SACCOs an edge over commercial banks in the lending market. This implies that with the increased cost of doing business, profitability is adversely affected and this creates a need for innovations like mobile banking. The existing studies have mostly focused on commercial banks in Kenya. The aspect of capital adequacy and cost of adopting mobile banking in Sacco's is yet to be researched. This study therefore sought to assess the adoption of mobile banking services by Kenyan Sacco's.

1.2 Objectives of the Study

- 1) To establish the effect of capital adequacy on the adoption of M-Banking by Sacco's in Kenya
- 2) To establish the effect of cost of innovation on the adoption of M-Banking by Saccos

2. Theoretical Literature

2.1 Diffusion of Innovation Theory (DOI)

DOI has been used since the 1950s to describe the innovation-decision process (Rogers, 1962).

According to the innovation-decision process, an individual or decision making unit, passes from first the knowledge of an innovation, then to forming an attitude toward the innovation to a decision to adopt or reject to implementation of the new idea and to confirmation of this decision. Das and Pal (2011) shows that the DOI is one of the most well known theories related to adoption of new technologies. Rogers transformed the model into five specific stages as follows (Rogers, 1995): knowledge occurs when an individual is exposed to an innovation's existence and gains some understanding of how it functions; persuasion occurs when an individual forms a favorable or unfavorable attitude toward the innovation; decision occurs when an individual becomes involved in activities that lead to a decision to adopt or reject the innovation; implementation occurs when an individual puts an innovation into use; and confirmation occurs when an individual seeks reinforcement for an innovation-decision already made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation. In the persuasion stage, five attributes that persuade an individual to adopt the innovation are: relative advantage, compatibility, complexity, trial ability and observability.

2.2 Pecking order Theory

The Peking order theory by Donaldson, (1961) is a capital structure theory. This theory was modified by Myers and Majluf (1984). According to Myers and Majluf (1984) businesses adhere to a hierarchy of financing sources. Hence prefer internal sources when available, debt is preferred over equity. According to this theory finance managers prefer capital structure that is beneficial to the firm while avoiding risk. A firm with a stable capital is presumed to perform better. Too much leverage in a firm is dangerous to a firm.

Debt finance has a tax shield advantage. However in the long-term, increase in cost of debt may lead the firm to be financially overstretched leading financial distress crisis, (Frank and Goyal, 2005). The management must therefore evaluate financial variables fully before making financial decisions.

2.3 Empirical Literature

2.3.1 Capital Adequacy

Among depository institutions, the adoption of Basel III regulations has posed a number of challenges. The functional challenges include developing specifications for the new regulatory requirements, such as the mapping of positions (assets and liabilities) to the new liquidity and funding categories in the Leverage Capital Ratio calculation as well as to the stricter defined capital categories. As such, many depository institutions have developed some difficulties in calculation of risk ratios as Basel III specifies three different methods to be used. It poses a challenge to determine the best method applicable to the financial institution in question (Auer, Pfoestl, & Kochanowicz, 2011).

The core capital of DTS is defined in the law to be composed of member shares, retained earnings and donations. The regulation 2010 mandatorily requires DT-Saccos to maintain a core capital of 10 Million and the SASRA analysis show an increased in the core capital of DT-Saccos from 33.2M in 2014 to Ksh.41.71 M in 2015. Unlike in the banking sector where the core capital requirement is set at a flat figure of Sh1 billion the Sacco members' input varies with the asset position each year. This has posed a challenge as the calculation of ratios depends on members input that is variable. This means that there is no constant base in the calculation of such ratios and in the absence of an integrated financial information system the SACCO would not be able to accurately define the ratios required for capital adequacy. A number of SACCOs, especially the smaller ones that lack such integrated financial information systems have to rely on auditor's reports to determine their position with regard to the minimum stipulated requirements (Ngigi, 2013). According to the SACCO Act of 2008, SACCOs have to provide a minimum core capital of not less than KES 10 million as shown in their financial statements. However, newly founded SACCOs have to provide this evidence through submission of bank statements before licensing.

All SACCOs have to comply with three capital adequacy ratios as stipulated in the Regulations. The Regulatory requirements on these are that the SACCOs are to have and maintain at all times a core capital of not less than KES10 Million, a core capital of not less than ten percent of total assets, an institutional capital of not less than eight per cent of total assets and a core capital of not less than eight per cent of total deposits. WOCCU PEARLS guidelines provide for 10-20% member share capital and 10% institutional capital (WOCCU, 2005) According to the PEARLS standards, prescribed by WOCCU, institutional capital should represent 8% of the SACCO's total assets. WOCCU maintains a higher than Basel standard of 10% of total assets because SACCOs typically face higher risk in volatile, minimally regulated markets with high levels of geographic

concentrated risk (Richardson, 2002). It follows, then, that a SACCO that wishes to undertake FOSA operations must consider capital adequacy, at the bare minimum for purposes of meeting regulatory requirements, to ensure continual licensing by SASRA which is on an annual basis.

2.3.2 Cost of Innovation

Kenyan Saccos have invested heavily in ICT infrastructure in order to reap the benefits associated in technology such as convenience, reduction on operating cost, ease of access of financial services, SACCO agencies and mobile technology; and move away from the traditional brick and mortar based services.

Core deposit-taking services including application for memberships, opening of accounts, application for and approval of loans, loan repayments, deposits and withdrawals, transfer funds, payment of bills and account's statements, must at the minimum be available online and through the mobile platforms. Requiring members to visit a branch or make a phone call to complete these basic services are a discouragement to retention of members. The use of social media platforms; and interactive websites to respond to members' queries, advertise financial services and gauge level of satisfaction is critical for survival in the current digital age. (Sasra annual report 2015)

Additionally, increased adoption and usage of digitally enabled deposit-taking Sacco financial services is expected to lead to a transformation in digitally-enabled financial technologies and create new value chains for DT-SACCOs, including leveraging on payment services. Revenues and profits are anticipated to migrate towards DT-SACCOs that are able to acquire, adopt and use ICT platforms in enabling their members to access core services, as this will positively impact on their operating efficiency and capacity.

On the downside of it, the use of ICT platforms in the provision of financial services will always poses greater risks especially in regard to cyber security and fraudulent transactions

3. Research Methodology

Descriptive design was used in the study. According to SASRA Sacco supervision annual report 2015 there are 177 DT- Saccos which have fully complied with the regulations. The study used evidence of Kiambu County which has 18 DT-Saccos which makes the target population. Kimbu County was chosen in this study as it is one of the richest counties with very many entrepreneurs and more SACCOs and thus with a target population of less than 30 ($N < 30$) a census was conducted. This study used secondary data from the audited and unaudited financial statements of all 18 DTS, SASRA annual reports and any other relevant material published by Saccos affiliates like KUSCCO for a period of five years. The data collected was mostly quantitative and was analyzed using, descriptive analysis techniques. Descriptive statistical method.

4. Findings and Discussion

4.1 Descriptive Statistics

The data for this study was subjected to descriptive analysis encompassing a range of both qualitative and quantitative treatments. Descriptive analysis was used because it enables the researcher to inspect the variables in their areas of study. Tabulation was a part of the technical procedure wherein the classified data were put in the form of tables (Kothari, 2005). Analyzed data was presented by use of tables,

frequencies, pie-charts and bar graphs where appropriate and finally making inference about the whole population. The analysis was based on the research objective the objective is tackled according to the analysis techniques designed in the methodology. The objective of this study was to establish the effect of capital adequacy and the effect of cost of innovation on the adoption of M-Banking by Sacco's in Kenya.

4.2 Adoption of mobile banking

Table 4.1: Adoption Table per Sacco

SACCO Name	Number of years of operation	Total number of members	Numbers adopted mobile banking	Adoption ratio = $\frac{\text{no of customer using mobile banking}}{\text{total no of Sacco customer}}$
All churches sacco	5-10 years	5000	3000	0.6
Banana hills sacco	5-10 years	5000	0	0
Dimkessacco	5-10 years	15000	8000	0.53
Farijisacco	5-10 years	4000	2500	0.63
Fundilimasacco	>10 years	4500	2000	0.44
Githunguri dairy sacco	>10 years	10000	6500	0.65
Jacaranda sacco	5-10 years	1500	0	0
Jijengesacco	5-10 years	2000	0	0
K-unity sacco	>10 years	15000	7500	0.5
Kenversitysacco	>10 years	6000	4800	0.8
Kenya canners sacco	>10 years	4800	3000	0.62
Kiamba dairy sacco	>10 years	5000	3800	0.76
Kingdom sacco	>10 years	5000	4200	0.84
Metropolitan sacco	>10 years	8000	6500	0.81
Nest sacco	5-10 years	1000	0	0
NRS sacco	>10 years	5000	2200	0.44
Orient sacco	>10 years	4000	3000	0.75
Tai sacco	>10 years	15000	8000	0.53
Total		115,800	65,000	0.56

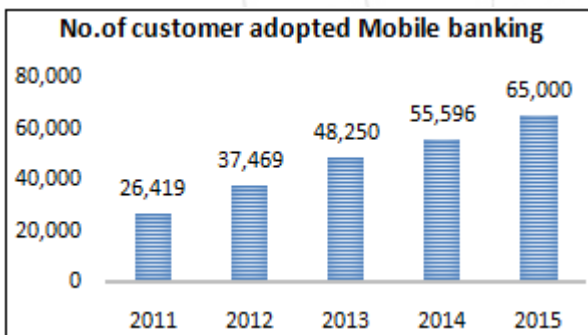


Figure 4.1: Mobile banking adoption

The study sought to find out the number of years the Sacco has been in operations, the number of registered members in the Sacco and the total number of members adopted mobile banking. The finding in table 4.1 revealed that most of members in the Sacco registered within 5-10 years had not adopted mobile banking. This implies that some of these Sacco's are yet to implement mobile banking in their operations. The study further revealed that all members in Sacco's which have been in operation for more than 10 year have adopted mobile banking. Figure 4.1 show the overall trend per annum in adoption of mobile banking. The trend has been increasing from 2011 implying that Sacco are increasingly adopting mobile banking in their operations. This implies that most of the Sacco have adopted the current technology to remain competitive in the banking industry. This findings supports those of Keli (2012) who conducted a

similar study in commercial banks and found that adoption of mobile banking by competitor in the industry.

The study sought to investigate trends in adoption of mobile banking (Natural logarithm of total number of customers) from 2011 to 2015. The results are displayed on table 4.2 below.

Table 4.2 Adoption

Year	Median (B)	min (B)	max(B)	mean (B)	Stdv(B)
2011	1,135	0	3500	1467.722	1134.689
2012	1,505	0	4800	2081.611	1630.440
2013	1,850	0	6500	2680.556	2133.407
2014	2,478	0	7700	3088.667	2383.299
2015	3,000	0	8000	3611.111	2700.183

From the findings, it can be noted that the year 2015 recorded the highest value for the adoption of mobile banking as shown by a mean of value of 3611.11 while the year 2011 recorded the lowest value for the customers' adoption on Mobile banking as shown by mean value of 1467.722. In addition, values for standard deviation depicts variability in mobile banking adoptions during the five year period with the highest deviation of 2700.183 in the year 2015 and the lowest 1134.689 in the year 2011. The findings revealed that there have been a significant increase in adoption of mobile banking during the five-year period.

4.3 Innovation cost

The study sought to find out the effect of innovation cost on adoption of mobile banking in Sacco's, where cost of innovation cost= (*Innovation cost/operating cost*)

Table 4.3: Innovation cost per sacco

Name of the Sacco	Total operation cost per annum (million)	Innovation cost per annum (million)	Cost ratio= <i>Innovation cost</i> <i>Operating cost</i>
All churches sacco	30	1	0.03
Banana hills sacco	30	1	0.03
Dimkessacco	726	10	0.01
Farijisacco	36	5	0.14
Fundilimasacco	29	3	0.10
Githunguri dairy sacco	508	7	0.01
Jacaranda sacco	36	0.5	0.01
Jjengesacco	205	3	0.01
K-unity sacco	581	8	0.01
Kenversitysacco	218	3	0.01
Kenya cannery sacco	295	5	0.02
Kiamba dairy sacco	436	6	0.01
Kingdom sacco	418	6	0.01
Metropolitan sacco	310	5	0.02
Nest sacco	30	0.5	0.02
NRS sacco	40	6	0.15
Orient sacco	320	5	0.02
Tai sacco	590	8	0.01
Total	4838	84	0.02

Table 4.4: Innovation cost

Year	Median (M)	min (M)	max(M)	mean (M)	Stdv(M)
2011	1.75	0.1	5	1.600	1.261
2012	2.50	0.1	6	2.317	1.579
2013	3.00	0.1	6	3.006	1.948
2014	3.50	0.3	8	3.417	2.163
2015	5.00	0.5	10	4.667	2.630

From the findings in table 4.3 and table 4.4 above, revealed that the innovation cost was high in the year 2015 as shown by a mean of value of 4.667 while the year 2011 recorded the lowest cost of innovation with a mean of 1600. The values for standard deviation depicts variability in cost of innovation during the five year period with the highest deviation of 2.63 in the year 2015 and the lowest 1.261 in the year 2011. The findings revealed that the cost of innovation has been increasing for the period of five years of adoption of mobile banking in the various Sacco's. This implies that adoption of mobile banking increased the cost of operations in the various Sacco's.

Figure 4.2 below show the trend of cost of innovation and the operational cost of the Sacco for the period of five year. The movement of the curves indicated the both the cost of innovation and operations cost were increasing with a very small merging. This implies that innovation cost was very significant in the mobile banking adoption. However the operational cost was indicated aspects of linearity implying that the cost was almost constant in the period. Thus Sacco's are much more investing on innovation to cope with the competition in the market by providing efficient and effective services to members.

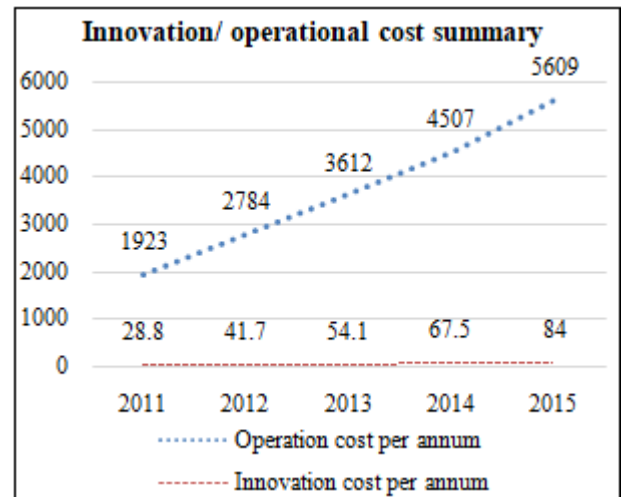


Figure 4.2: Innovation cost

4.4 Capital adequacy

The study sought to investigate trends in capital adequacy as measured by(*core capital p. a/ total asset p. a*)

Table 4.5: Capital adequacy per Sacco

Year	Median (B)	min (B)	max(B)	mean (B)	Stdv(B)
2011	715	20	8000	1125.5	1782.63
2012	568.5	14	5800	860.05	1302.11
2013	440	10	4200	662.33	956.93
2014	354.5	9	3900	565.61	876.87
2015	316	8	3500	497.16	792.47

Table 4.6: Capital adequacy summary for five years

Year	Core Capital (M)	Total Assets (M)	Capital adequacy Ratio
2011	1330.4	8949	0.148665
2012	1513.6	10181	0.148669
2013	1772.5	11922	0.148675
2014	2301.7	15481	0.148679
2015	3017.5	20295	0.148682

From the findings in table 4.5 above, revealed that the capital was high in the year 2011 as shown by a mean of value of 1125.5 while the year 2015 recorded the capital adequacy with a mean of 497.16. The values for variation depicted in the standard deviation show capital adequacy decline down the number of years from 2011 to 2015. The declines was due to the most recent registered Sacco's whose Capital introduced was low leading to the low average. The findingsrevealed that the old Sacco's had more Capital than recent introduced. The finding in Table 4.6 revealed a very low change in the capital ratio over the period of five years. This revealed that capital was not increasing over the years. That would mean no new capital was being introduced in the existing Sacco's, where the slight change in the ratios would be explain by the introduction of new Sacco in the market.

Figure 4.3 below show the trend in core capital and total assets of the Sacco for the period of five year. The movement of the curves indicated that both the core capital and total assets were increasing. However core capital was increasing fast more than total assets. This implies that not all capital introduced invested in assets. The variation in would also mean that some Sacco were financed by debt.

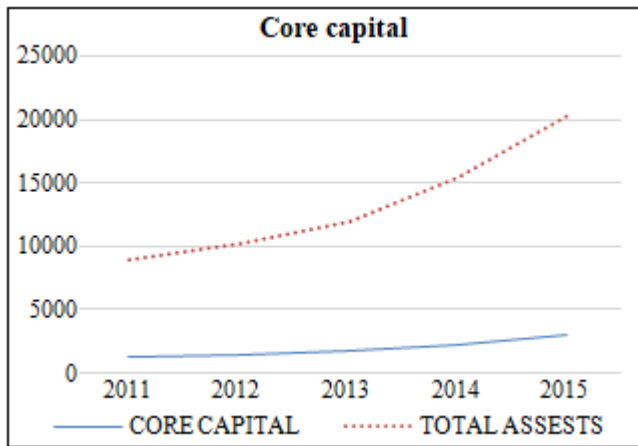


Figure 4.3: Trend on capital Adequacy for five years

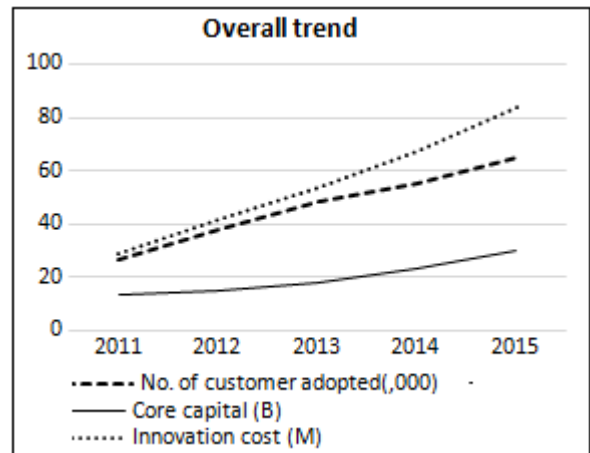


Figure 4.4: Overall trend of capital, innovation cost and adoption.

4.5 Overall findings

Table 4.7: Overall adoption summary Per Annum

Year	No. of customer adopted	Core capital (B)	Innovation cost (M)	Mean	Stdv
2011	26,419	1330.4	28.8	18,850	12426.16
2012	37,469	1513.6	41.7	26,894	18029.76
2013	48,250	1772.5	54.1	34,708	23410.70
2014	55,596	2301.7	67.5	41,799	28348.64
2015	65,000	3017.5	84	50,673	34578.41

The study sought to establish the effect of capital adequacy and innovation cost on adoption of mobile banking in Sacco's in Kenya. The finding in table 4.7 revealed that the core capital of Sacco's in the period of five years was increasing as depicted by the mean of 15,065 in the year 2011 and 43,509 in the year 2015. The standard deviation had a variation close to the mean variation over the period of five years. This revealed that both Capital adequacy and innovation cost had an average effect on adoption of mobile banking in Sacco's.

Figure 4.4 show the trend of core capita of the Sacco and innovation cost against number of customers adopted mobile banking over the period of five years. The findings revealed that there was a close relationship between capital, innovation cost and number of customer's adoption to mobile banking. The trend increase from the year 2011 with the highest point recorded in year 2015. This finding revealed that both capital and innovation cost increased as number of member adopting mobile banking increases implying that capital adequacy of the Sacco was a determinant to innovation. Sacco with high capital recorded highest number of mobile banking adoption. This finding support those of Awadhi (2013) who found that capital of a firm influences the adoption of mobile banking.

5. Conclusions and Recommendations

5.1 Conclusion

The study concludes there is a positive relationship between the adoption of mobile banking and the two sturdy variables namely capital adequacy and cost of innovation and they are significant in predicting adoption of mobile banking. This is supported by the finding which indicated that those Sacco's with high capital and they have been in operations for many years, have many member and have heavily unvested in ICT thus have high level of adoption.

5.2 Recommendations

The study recommended, the management of Sacco's in Kenya to invest more on adoption of mobile banking in Sacco's trough their annual budgetary allocation, as this would lead to more customers hence profitability.

Capital adequacy was found to be significant and therefore it's recommended that Sacco's should find ways and means of increasing their initial capital to enhance mobile banking adoption.

Cost of Innovation was found to be significant therefore the top management of SACCOs should show support and campaign for the adoption of mobile banking. This will help to reduce staff and clients resistance to changes that come with the adoption of mobile banking and also devote more funds towards ICT infrastructures. However the Sacco management to focus on growth and expansion of the firm to enjoy economies of scale such as reduction of innovation cost and other operation cost in the Sacco,

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