

# Role of Financial Innovations on Financial Performance of Commercial Banks in Kenya: A Case of KCB Bank Kenya Limited

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**Abstract:** Over the last decade, the role of banking in the process of financial intermediation has been undergoing a profound transformation, owing to changes in the global financial system. Kenya's banking system has seen some major financial innovations in the past decade as well as steps to promote financial inclusion. The major impetus for financial innovation has been globalization of financial systems, deregulation, and great advances in technologies. Kenyan commercial banks have continued to use huge investments in technology based innovations and training of manpower to handle new technologies. The relationship between the growing investment in technology based bank innovations and bank financial performance in Kenya needs to be studied and establish whether innovations have contributed to the financial performance of commercial banks in Kenya. This research studied innovations in the area of automated teller machines, debit and credit cards, internet banking, mobile banking, electronic funds transfer and point of sale terminals. These innovations were studied in relation to their effect on commercial banks' financial performance indicators namely: total income, profit before tax, return on assets and deposits. The main objective of this study was to establish the effect of bank innovations on financial performance of commercial banks in Kenya. The specific objectives were: to establish the effect of bank innovations on income, return on total assets, profitability and customer deposits of commercial bank in Kenya. A descriptive survey design was used while a questionnaire was used to gather primary data. Secondary data was also used to validate the communicative and pragmatic validity of primary data. The target study units for this research were 20 KCB Bank Kenya Limited branches. The study sample in terms of the respondents covered the senior management only and a sample of 140 was administered with the questionnaire and a 75% response rate was achieved. Statistical analysis was done with the aid of Statistical Package of Social Sciences (SPSS) software. The findings revealed that bank innovations had statistically significant influence on income, return on assets, profitability and customer deposits of commercial banks in Kenya and tests for significance also showed that the influence was statistically significant. Based on the findings of the study, it can be concluded that bank innovations influence financial performance of commercial banks in Kenya positively. It is therefore recommended to the management of commercial banks and the Government continue to explore and implement sustainable business linkages and collaborations with mobile phone service providers as well as the internet service providers as a way of accelerating the penetration of innovations and eventually creating desired impacts in the economy. Banks should leverage on mobiles phones in order to grow their business and customer base. This study did not include all bank innovations and a further study is recommended to include innovations like agency banking, securitization and credit guarantees and their influence on the financial performance of commercial banks.

**Keywords:** Statistical Package of Social Sciences (SPSS) software, global financial system.

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## 1. INTRODUCTION

### Background of the Study:

Innovation consists of firms developing new products or new production processes to better perform their operations, in which case the new products could be based on the new processes (Tufano, 2002; Lawrence, 2010). In the financial services industry, innovation is viewed as the act of creating and popularizing new financial instruments, technologies,

institutions and markets, which facilitate access to information, trading and means of payment (Solans, 2003). Lerner (2002) puts forward that innovations are not just critical for firms in the financial services industry, but also affect other companies; for instance, enabling them to raise capital in larger amounts and at a lower cost than they could otherwise and that innovation is an important phenomenon in any sector of a modern economy. According to Nofie (2011), innovations in the finance sector is the arrival of a new or better product and/or a process that lowers the cost of producing existing financial services. Akamavi (2005) also notes that innovation in the financial services sector has led to recent fundamental changes including; deregulation, increasing competition, higher cost of developing new products and the rapid pace of technological innovation, more demanding customers and consolidation of corporations.

Financial innovation has been an integral component of economic activity for several millennia (Goetzmann, 2009). About six thousand years ago, the Sumerian city of Uruk blossomed as tradable debt contracts emerged to facilitate a diverse assortment of inter-temporal transactions underlying increased specialization, innovation, and economic development (Goetzmann, 2009). In ancient Rome, private investors steadily developed all of the features of limited liability companies, including freely traded shares, an active stock exchange, and corporations that owned property and wrote contracts independently of the individual shareholders. The creation of these corporations eased the mobilization of capital for innovative, large-scale mining technologies (Malmendier, 2009). Further, Malmendier (2009) indicates that to finance the construction of vast railroad systems in the 19th and 20th centuries, financial entrepreneurs developed highly specialized investment banks, new financial instruments, and improved accounting systems to foster screening by distant investors.

Another profound influence on the provision of financial services has been the huge advance in information technology and communication (Heikkinen and Korhonen 2006). Hamilton, Nigel and Adrian (2007) emphasise that the ability to assimilate data and to perform complex calculations has helped market practitioners to develop new financial products that decompose and repackage different components of financial risk. These new products can be matched more closely to the demands and risk preferences of both investors and borrowers and thus improve the completeness of financial markets. The innovation process has been underpinned by the widespread and ready electronic access to news and information on economic and financial developments and on market responses.

With the deepening of the reform process, Chinese commercial banks' traditional businesses operations mode 'the wholesale credit operations' have been changing and the ratio of commercial banks' retail businesses have been increasing. For example the Bank of China as an example, during 2006-2007, the growth rate of retail business was 250%, which was 2.5 times of the growth rate of wholesale business at the same period. One of the important reasons for this change is innovation which includes innovation in business philosophy, management, procedure, product, promotion and scientific and technology (Yin and Zhengzheng, 2010). Financial innovations arise due to several reasons (Batiz-Lazo and Woldesenbet, 2006). Gorton and Metrick (2010) and Batiz-Lazo and Woldesenbet (2006) summarize the reasons for the growth of modern financial innovation as; reduction in bankruptcy costs, tax advantages, reduction in moral hazard, reduced regulatory costs, transparency and customization. A highly turbulent environment leads to successful innovation creating a unique competitive position and competitive advantage and lead to a superior performance (Roberts and Amit, 2003). This can only be maintained by ceaseless innovation and improvement of the product and the process (Porter, 2004).

In a study on the banking sectors of 11 Latin American countries, Yildirim and Philippatos (2007) stipulate that rivalry between banks pushes the banks to engage in a differentiation processes of the products they supply, and can stimulate financial innovation. Yildirim and Philippatos (2007) find that a high degree of foreign investment in banks' capital is associated with a high level of competitiveness. This improves the quality and differentiation of their products and stimulates financial innovation by introducing more modern skills, management techniques and technologies. Size also makes it easier to diversify business risk by starting up a variety of innovative projects (Corrocher, 2006). Anbalagan (2011) finds that some types of financial innovations are driven by improvements in computer and telecommunication technology and argues that for most people the creation of the Automated Teller Machines was greater financial innovation than asset backed securitization.

Ferreira, Manso, and Silva (2010) found that private instead of public ownership spurs innovation. Empirical evidence using United States data shows that laws (Fan and White, 2003; Armour and Cumming, 2008; and Acharya and Subramanian, 2009), corporate governance (Subramanian, and Subramanian, 2009 and Chemmanur and Tian, 2010),

capital structure (Atanassov, Nanda, and Seru, 2007), stock liquidity (Fang, Tian, and Tice, 2010), product market competition (Aghion, Bloom, Blundell, Griffith and Howitt, 2005), investors' attitude towards failure (Tian and Wang, 2010), and institutional ownership (Aghion, Van Reenen, and Zingales, 2009) all influence innovation. Financial innovations have led to a revolution in the way the banking business is conducted as found by Yin and Zhengzheng (2010) who demonstrates evidence that Chinese commercial banks have moved from the traditional business operation mode; the wholesale credit operations to the retail mode as a result of technological innovations. In India, Pooja and Singh (2009) conclude that internet banks were larger, more profitable, had higher asset quality, lower administrative expenses and were more efficient compared to the non-internet banks. In Jordan, e-banking resulted to more satisfied customers and better long-term cost saving strategies (Siam, 2006).

Mabrouk and Mamoghli (2010) found that return on assets is positively and significantly associated with the first mover and imitation of product innovations in the Tunisian banking industry. In Ghana over time, technology has increased in importance in Ghanaian banks and has transformed the way banks would serve their clients more conveniently and in the process increase profits and competitiveness while the most revolutionary electronic innovation in Ghana and the world over has been the ATM (Joshua, 2010). In Nigeria, internet banking has resulted to improved e-Commerce and e-Payment services with overall reduction in the amount of currency in circulation (Chiemeke, Ewwiekpaefe and Chete, 2006; Ayo, Adebisi, Fatudimu and Ekong, 2008; Aderonke and Charles, 2010). In Mauritius, Padachi, Rojid and Seetanah (2008) observe that the two main banks; Mauritius Commercial Bank and the State Bank of Mauritius improved their financial performance on implementation of new technology.

Closer home, Gardachew (2010) document that Ethiopian banks have not been able to achieve efficiency as a result of slow adaptation of technological innovations. In Uganda, adoption of electronic and mobile banking has increased access to banking services (Porteus, 2006). In Kenya, effective use of Information Technology [IT] has led to better utilisation of personnel and organizations assets, increased revenues and increased access to financial services by the general population (Mwania and Muganda, 2011). Ndung'u (2011), concurs that in only four years (2007-2011) of the existence of mobile phone money transfer services in Kenya; four mobile phone operators are in place with 15.4 million customers and over 39,449 agents. Total transactions in 2010 averaged Ksh.2.45 billion a day and Ksh.76 billion a month resulting to lower transaction costs and increased access to financial services. This depicts a very productive market for electronic money transfers (Ndung'u, 2011).

Innovations have posed various challenges to regulators and banks themselves while the breakdown of barriers to the supply of financial products and the large volume of risk pooling and shifting within and across borders has increased the network interconnections within the global financial system (Nigel, Penalver and Nicholas 2008). This has added to the system's complexity and corresponding evolution of financial system risks posing major challenges for financial institutions and for authorities charged with maintaining financial stability (Nigel, Penalver and Nicholas 2008). New instruments in structured finance develop so rapidly that market infrastructure and systems are not prepared when those instruments came under stress (Mark, 2010).

Pradhah and Mishra (2008), Mario (2007), Noyer (2007) and Iris and Grimes (2003) have pointed out that financial innovations bring risks and uncertainties, particularly with respect to the complexities they pose to the conduct of monetary policy. They concur that central banks operate monetary policy efficiently only in the short term and after sometime, when new instruments are introduced to the market, new challenges emerge which disrupt the conduct of monetary policy. Moreover, new developments in the financial system also require new regulations to ensure the effectiveness of monetary policy is not compromised (Iris and Grimes, 2003). Financial innovation and change in monetary procedures and control follow each other and Central banks have therefore to change their tools, targets and operating procedures from time to time so as to cope with innovation and ensure the sustainability of the financial system (Misati, Njoroge, Kamau and Ouma, 2010).

## **2. FINANCIAL INNOVATIONS**

Financial innovation is the unanticipated improvement in the array of financial products and instruments that are stimulated by unexpected change in customer needs and preferences, tax policy, technology and regulatory impulses Bhattacharyya & Nanda (2000). According to Lawrence (2010), financial Innovation involves the design, the development, and the implementation of innovative financial instruments and processes, and the formulation of creative

solutions to problems in finance. According to Ignazio (2007), financial innovations can be grouped as new products (e.g., adjustable rate mortgages; exchange- traded index funds); new services (e.g., on- line securities trading; Internet banking); new "production" processes (e.g., electronic record-keeping for securities; credit scoring); or new organizational forms (e.g., a new type of electronic exchange for trading securities; Internet- only banks). Financial innovation has not only opened up new opportunities for the sector participants, but also increased new market players arising from new products in the financial market (Noyer, 2007).

The developments in the financial sector have not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and asset alternatives to holding money. Associated with this rapid expansion in the banking sector is a range of financial innovations: the ATMs and debit cards introduced in the late 1990s; the electronic money introduced in early 2007; Value capping in 2009: the agent banking model introduced in mid- 2010; Cheque Truncation System (CTS) in 2012 and more recently T+1 (cheques clearing in one day) in 2013 (CBK report, 2013). Other innovations in banking and financial sector are RTGS, EFT, ACH, MICR, Retail Banking, free advisory services, implementation of standing instructions of customers, payments of utility bills, fund transfers, internet banking, telephone banking, mobile banking, selling insurance products, issue of free cheque books, travelers cheques and many more value added services (CBK report, 2013).

### **Commercial Banks in Kenya:**

The banking sector in Kenya is comprised of 47 commercial banks, two mortgage finance companies, 130 foreign exchange bureaus and fifteen micro finance institutions (CBK, 2015). The companies Act, the Central Bank of Kenya Act Cap 491, the banking Act Cap 488 and the micro finance Act 2006 are the main regulators and governors of the banking industry in Kenya. The Acts are used along with prudential guidelines that are issued by the central bank of Kenya. In 1995 the exchange controls were lifted after liberation of the banking in Kenya. Today banking is known as innovative banking. Financial innovation associated with technological change has totally changed the banking philosophy and that is further tuned by the competition in the banking industry in Kenya. Challenging business environment within the banking system has created more innovation in the fields of product, process and market.

### **Statement of the Problem:**

Despite the undeniable importance of financial innovation in explaining banking performance, the impact of innovation on performance, is still misunderstood for two main reasons, first, there is inadequate understanding about the drivers of innovation and secondly innovations' impact on bank's performance remains lowly untested (Mabrouk and Mamoghli, 2010). A study by De Young, Lang and Nolle (2007) adopt an approach to the innovation performance relationship which does not take into account the antecedents to innovation inside and outside the banking organization, all of which could influence this relationship. Frame and White (2008) point out that one of the major barriers to the study of financial innovation has been an insufficient quantity of data. Previous studies like Pooja and Singh (2009), Franscesa and Claeys (2010), Batiz-Lazo and Woldesenbet (2006) and Mwanja and Muganda (2011) have produced mixed results regarding the impact of financial innovations on bank performance. Pooja and Singh (2009) and Franscesa and Claeys (2010), in their studies concluded that financial innovations had least impact on bank performance, while Batiz-Lazo and Woldesenbet (2006) and Mwanja and Muganda (2011) concluded that financial innovation had significant contribution to bank performance. It is at the center of such mixed conclusions that created and necessitated the need to carry out a study from a Kenyan context to establish the effect of bank innovations on commercial banks' performance.

The outcome of the previous studies on effect of financial innovation on performance has been empirically inconclusive (Bonn, 2000). Previous studies have produced mixed results regarding the effect of financial innovations on bank's financial performance. Scholars (Pooja and Singh, 2009: Franscesa and Claeys, 2010), in their studies concluded that financial innovations had least impact on financial performance, while others (Batiz- Lazo and Woldesenbet, 2006: Mwanja and Muganda, 2011) concluded that financial innovation had significant contribution to financial performance. It is at the center of such mixed conclusions that has created and necessitated the need to carry out a study from a Kenyan context to establish the effect of financial innovations on commercial banks performance. Lerner and Tufano (2011) in their study on consequences of financial innovations contend that existing empirical evidence and conceptual frameworks can tell more about financial innovation, but there are substantial unanswered questions in the areas of social welfare impact of financial innovations, impact of innovations on financial institutions. Rafael and Francisco (2007) studied the

impact of various regional banking sector developments and innovations during 1986- 2001 in Spain. The study found out that product and service delivery innovations contribute positively to regional Gross Domestic Product (GDP), investment and gross savings growth. These sentiments are shared by Hendrickson and Nichols (2011), while studying the performance of small banks in the United State with regards to interstate branching and found out that banks perform better when they adopt innovations across their several branches. Based on these studies and the varying gaps in literature, there is need to conduct similar studies in Africa and more so in Kenya where bank innovations have been on the rise in the past decade.

#### **Research Objectives:**

##### **Specific Objectives**

The study pursued the following specific objectives;

- 1) To determine the effect of use of Automated Teller Machines on financial performance of commercial banks in Kenya.
- 2) To establish the effect of use of mobile banking on financial performance of commercial banks in Kenya.
- 3) To assess the effect of use of internet banking on financial performance of commercial banks in Kenya.
- 4) To examine the effect of use of electronic fund transfer on financial performance of commercial banks in Kenya.

### **3. THEORETICAL LITERATURE REVIEW**

#### **Schumpeter Theory of Innovation:**

In the 1930s Schumpeter started studying how the capitalist system was affected by market innovations. After analyzing the capitalist model Schumpeter tried to understand what companies would be in a better position to innovate. He developed a theory where a company's ability to innovate was mainly connected to its size. Initially he defended that small companies should be in a better position to innovate due to flexibility while larger companies might get trapped in bureaucratic structures. Schumpeter (1928) argued that entrepreneurs, who could be independent inventors or research and development (R&D) engineers in large corporations, created the opportunity for new profits with their innovations. In turn, group of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle all over again.

Schumpeter (1939) drew a clear distinction between the entrepreneurs whose innovations create the conditions for profitable new enterprises and the bankers who create credit to finance the construction of the new ventures. Schumpeter (1939) emphasized that the special role of credit-creation by bankers was 'the monetary complement of innovations'. Therefore, as independent agents who have no proprietary interest in the new enterprises they fund, bankers bear all the risk. This requires having the special ability to judge the potential for success in funding entrepreneurial activities. According to Schumpeter (1939) it is just as important to deny credit to those that lack that potential as it is to supply those that have the potential for success.

#### **Constraint-Induced Financial Innovation Theory:**

American economist Silber (1983) advanced constraint-induced financial innovation theory. This theory pointed out that the purpose of profit maximization of financial institution is the key reason of financial innovation. There are some restrictions (including external handicaps such as policy and internal handicaps such as organizational management and leadership style) in the process of pursuing profit maximization in an organization. According to Silber (1983), these restrictions and limitations not only guarantee the stability of management, they reduce the efficiency of financial institution, and so financial institutions strive toward casting them off. Constraint-induced innovation theory discussed the financial innovation from microeconomics, so it is originated and representative. But it emphasized "innovation in adversity" excessively. So it can't express the phenomenon of financial innovation increasing in the trend of liberal finance commendably.

#### 4. RESEARCH METHODOLOGY

This chapter focuses on the research methodology employed in this study. It also addresses the research design, study population, as well as the sample design. Research instruments and the approach to data collection are well described, as are the methods of data analysis. Dawson (2009) states that research methodology is the philosophy or general principle which guides the research. Zikmund, Babin, Carr and Griffin (2010) describe a research methodology as a part that must explain technical procedures in a manner appropriate for the audience.

##### Research Design:

Kumar, (2005), defined a research design as a procedural plan that is adopted by the researcher to answer questions validly, accurately, objectively and economically. A researcher design helps to conceptualize the researcher plans to undertake various procedures required to complete the study. Miller and Yang (2008) and Kothari (2004) describe a research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The study adopted a descriptive research design. The descriptive design has been used because it gives the description of our phenomenon just the way it is. In descriptive research approach, one has no control on the variables, but can only report what happened or is happening and seeks to measure items such as frequency, people’s preferences or similar data.

#### 5. RESULTS AND DISCUSSIONS

The objective of the study was to determine the effect of use of Automated Teller Machines ,mobile banking ,internet banking ,and electronic funds transfer on financial performance of commercial banks in Kenya.

##### Effect of use of ATMs on Financial Performance:

The study sought to determine the effect of ATMs on the bank performance. Table 1.1 shows that 82% of the respondents agreed that the ATMS are at convenient places, 73% agreed that the ATMS are user friendly and 85% agreed that bank clients find ATMs easy to use. All the respondents agreed that the ATMS have helped ease congestion in banking halls. The mean score of the responses for this section was 3.96 which indicates that majority of the respondents agreed with the statements regarding the effect of ATMs on bank performance. These results imply that the respondents were happy due to the introduction of ATMs as they would access the banking services at their own time and convenience.

**Table 1.1 Effect of use of ATMs on financial performance**

<b>Statement</b>	<b>SA</b>	<b>A</b>	<b>D</b>	<b>SD</b>	<b>N</b>	<b>Likert Mean</b>
ATMs have had a positive effect of increasing total incomes of the bank since the ATMs are at convenient places	24%	58%	0%	18%	0%	3.71
ATMs influence reduction of operational costs and hence better return on assets for the bank	38%	35%	9%	18%	0%	3.68
ATMs have expanded the income generating potential of the bank and increased profitability and return on assets since they are user friendly and the bank’s clients find them easy to use	50%	35%	0%	15%	0%	4.06
ATMs have led to increased customer deposits as customers do not have to queue on the banking halls to deposit since ATMs have helped ease congestion in banking halls	38%	62%	0%	0%	0%	4.38
Overall Likert Mean						<b>3.96</b>

##### Effect of use of Mobile Banking on Financial Performance:

The study sought to establish the effect of mobile Banking on financial performance of banks. Table 1.2 indicates that 85% of the respondents agreed that mobile banking has resulted to increased incomes due to ease of transacting and convenience, 97% agreed that mobile banking influence reduction of operational costs, 82% agreed to the fact that incomes generated have had a positive impact on banks profit margins while 79% have agreed that use of mobile banking has led to increased customer deposits due to convenience and ease of transacting. The mean score for the responses was 4.12 which indicate that many employees agreed that use of mobile banking was a key driver of bank’s financial performance. The results revealed that use of mobile banking influenced bank performance.

**Table 1.2 Effect of use of Mobile Banking on financial performance**

Statement	SA	A	D	SD	N	Likert Mean
Mobile banking has resulted in increased incomes as a result of ease of transacting and convenience created to the customers which has resulted in improved income margins	50%	35%	15%	0%	0%	4.21
Mobile banking influence reduction of operational costs and hence better return on assets for the bank	35%	62%	0%	0%	3%	4.32
Incomes from mobile banking have had positive impact on banks profit margins	26%	56%	18%	0%	0%	3.91
Use of mobile banking has led to increased customer deposits since customers due to conveniences and ease of transacting	44%	35%	21%	0%	0%	4.03
<b>Overall Likert Mean</b>						<b>4.12</b>

**Effect of use of Internet Banking on Financial Performance:**

The study sought to establish the effect of internet banking on the bank performance. Results on Table 1.3 reveals that majority (79%) of the respondents agreed that internet banking has expanded income generating potential of the bank since customers did not fear internet banking due to fear of hacking of their accounts by web hackers, 85% agreed that internet banking influence reduction of operational costs since customers transact on their own and hence better return on assets for the bank and 65% agreed that internet banking has increased profitability of the bank since internet services are operated in a restricted and controlled environment in order to safe guard customer information. Sixty seven percent of the respondents agreed that internet banking has led to increased customer deposits due to security of deposits done through internet banking and that their bank always ensured security of data and information that was operated on the internet banking platform. The mean score of the responses for this section was 3.89 indicating that more employees agreed that on line banking was a key driver of bank performance.

**Table 1.3 Effect of use of Internet Banking on financial performance**

Statement	SA	A	D	SD	N	Likert Mean
Internet banking has expanded the income generating potential of the bank since customers do not fear internet banking due to fear of hacking of their accounts by web hackers	44%	35%	12%	3%	6%	4.06
Mobile banking influence reduction of operational costs since customers transact on their own and hence better return on assets for the bank	44%	41%	6%	3%	6%	4.18
Incomes from internet banking have had positive impact on banks profit margins since customers believe internet service are operated in a restricted and controlled environment in order to safe guard customer information	38%	27%	15%	8%	12%	3.71
Use of internet banking has led to increased customer deposits due to security of deposits done through internet banking	35%	32%	15%	15%	3%	3.59

**Effect of use of Electronic Fund Transfer on Financial Performance:**

The study sought to establish the effect of Electronic Fund Transfer on the bank performance. Results on Table 1.4 reveals that majority (82%) of the respondents agreed that EFT influence reduction of operational costs and hence better returns and increase in total income of the bank, 67% agreed that EFT influence reduction of operational costs and hence better return on assets for the bank and 79% agreed that Incomes from fees on EFT have had positive impact on banks profit margins. Seventy six percent of the respondents agreed that Use of EFT has led to increased customer deposits since customers can transact huge amounts of money. The mean score of the responses for this section was 3.90 indicating that more employees agreed that use of EFT was a key driver of bank performance.

**Table 1.4 Effect of use of Electronic Fund Transfer on financial performance**

Statement	SA	A	D	SD	N	Likert Mean
Electronic funds transfer influence reduction of operational costs and hence better returns and increase in total income of the bank	26%	56%	0%	18%	0%	3.74
Electronic funds transfer influence reduction of operational costs and hence better return on assets for the bank	35%	32%	15%	15%	3%	3.59
Incomes from fees on Electronic funds transfer banking have had positive impact on banks profit margins	50%	29%	9%	0%	12%	4.21
Use of Electronic funds transfer has led to increased customer deposits since customers can transact huge amounts of money	44%	32%	15%	0%	9%	4.06
<b>Overall Likert Mean</b>						<b>3.90</b>

**Regression Analysis:**

In order to establish the statistical significance of the independent variables on the dependent variable (profitability) regression analysis was employed. The regression equation took the following form;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where Y- Financial performance,  $\beta_0$  is the constant,  $\beta_1 - \beta_6$  are the coefficient of each of the independent variables, X1- Automated Teller Machine, X2- Mobile Banking, X3-Internet Banking, X4- Electronic Fund Transfer and  $\epsilon$  being the error term.

Table 1.5 gives the regression model summary results. It presents the R value which is the measure of association between the dependent and the independent variables, the R Square which is the coefficient of determination measuring the extent at which the independent variables influence the dependent variable as well as the Adjusted R Square which measures the reliability of the regression results

**Table 1.5 Summary of Regression Model**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.913 <sup>a</sup>	.834	.810	472

*a. Predictors: (Constant), ATMs, M-Banking, Internet Banking and EFTs*

Table 1.5 presents summary of regression model result. The value of R and R<sup>2</sup> are 0.913 and 0.834 respectively. The R value of 0.913 represents the correlation between financial performance and the financial innovations determinants (predictor variables). The R<sup>2</sup> which indicates the explanatory power of the independent variables is 0.834. This means that 83.4% of the variation in financial performance is explained by the independent variables. The results obtained are also reliable as given by the Adjusted R Square vale of 0.810 which explains that the study results are 81% reliable and therefore the regression model developed can be relied on to explain the trends in the financial performance of the commercial banks. The standard error of the estimate is 47.2, which explains how representative the sample is likely to be of the financial performance for future years.

**6. CONCLUSION**

Based on the findings of the study, it can be concluded that bank innovations influence financial performance of commercial banks in Kenya positively. The adoption of innovations by commercial banks has a high potential of improving financial performance and hence better returns to the shareholders. The competition in the banking industry has made their adoption rate to be high among both the banks and their customers. It could have been challenging if the adoption was only with either the banks or the customers. Banks in Kenya have continued to perform well even when other sectors of the economy show lagged performance. This can be explained by the use of innovations which have enabled banks to start making income away from traditional sources like interest, trade and asset financing. Banks have been able to make more commission income from transactions done on innovation channels like mobile phones, ATMs, internet and EFTs. It should also be noted that the performance on the Kenyan banking sector is not purely and wholly derived from bank innovations because there are other drivers of financial performance in the sector like; regulations, human resource, quality of management and corporate governance.



## 7. RECOMMENDATIONS

Banks should continue investing in innovation delivery channels because they are able to control their costs much better as compared to investment in brick and mortar or physical branches. The volume of transactions that can be processed on channels like the internet and mobile are high as compared to delivering such transactions using manual processes. This helps to minimize the cost per unit of service and hence better returns to the banks. Commercial banks should explore more ways of maximizing their utilization and returns from mobile banking and internet banking.

Since technological innovation is aggressively and continuously adopted in Kenya, the government should provide incentives for research and development to research scientists who would continue to invest their time and skills in discovering more bank innovations. It is recommended that the government also pursues a strategy to provide incentives for technology transfer from more developed economies in order to promote the adoption of world class innovations. Information and communication technology (ICT) professionals should invest their time, effort and resources towards innovations. This will mean more income for the professionals if the innovations become successful. In Kenya there are some citizens who are still unbanked due to poor access to financial services. ICT professionals should explore ways of providing innovative solutions for reaching the unbanked. This can result to more financial deepening and better financial development for the country and hence better profitability for the banks.

Innovation has its set of challenges especially related to security threat which can lead to reputation risk among banks and loss of confidence by the customers. The main users of bank innovations are depositors. Without deposits and depositors the sustainability of banks would be at risk. This therefore calls for better management of innovations in a manner that boosts depositors' confidence. System developers therefore need to create enhanced and effective security systems which can detect, control, prevent and manage fraud incidents on the various innovation channels. This recommendation is derived from the growing threat of system intrusion by hackers which can erode the desired gains of bank innovations.

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