

**THE EFFECT OF FINANCIAL INNOVATION ON THE FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

BY

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DECLARATION

This research project is my original work and has not been submitted before any other academic institution for any award.

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DEDICATION

To my husband Boniface Wahiu and my children Nicholas, Prudence, Caleb and Daniel for their selfless and continuing love and support. Lastly to my Parents, Kariu and Nyawira whose endless love ,sacrifice and prayers which have contributed to the woman I am today.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
ICT	Information Communication and Technology
PDA	Personal Digital Assistant
R&D	Research and Development
ROA	Return on Assets
ROE	Return on Equity
SMS	Short Message Service
UK	United Kingdom

ABSTRACT

The study endeavored to find the relationship between financial innovations and the financial performance of commercial banks in Kenya. The study variables were mobile phone, agency banking and ATM banking. The study adopted a descriptive research design. The target population of this study was all the 43 commercial banks in Kenya. The study used secondary data collected from the published annual reports for commercial banks spanning from 2012 to 2016 during which technological innovations have been intensely invested in by banks. The study used descriptive statistics using Statistical Package for Social Sciences V21. Multiple regression analysis was used to test the relationship between financial innovations and financial performance among commercial banks in Kenya. The study concluded that mobile phone banking, agency banking and ATM banking as financial innovations positively impacted the financial performance of commercial banks in Kenya over the 5 year period. The study recommends that management of the commercial banks in Kenya ought to enter into more partnerships with mobile phone services providers in an effort to ensure their customers continue to adopt the use of the platform in order to enhance financial performance. The study further recommends that banks should put more resources in ensuring that they partner with more agents especially in the rural areas where they do not operate branches so that they reach the unbanked. Finally, the study recommends that that the ATM networks be further increased especially in areas where no such facilities exist in order to reach more people.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Over the years and especially since year 2000, tremendous changes have occurred in the banking sector mostly triggered by inventions in the world of technology. Many innovations have come up which have revolutionized the banking processes and products. Banking services have progressively moved away from the banking hall while the level of financial inclusivity has gone up (Najmaei, 2010). Financial systems have been globalized and therefore geographical location is no longer a hindrance to financial access. Regulation also has an impact in this improved access in that some rules that governed regulation have also been done away with and most banks today operate on what is referred to as the integrated financial systems platform. This is a kind of one-stop shop for all the financial services (Wanjiku, 2008). Globally, according to Desai and Low (2010), financial innovation has for a particular period of time remained the main key to economic growth whether in any developing or developed country.

Innovations in ICT have changed the landscape of the financial sector such that today there exists numerous channels of delivering financial services and products. Key examples include Automated Teller Machines, mobile phone, online and Agency banking (Ahmad, 2006). These innovations that use ICT are variously referred to electronic banking (e-banking) which is also a type of electronic commerce (E-commerce). Electronic banking has become very popular in the efforts to improve service delivery and scaling up the banks' profitability (Beck *et al.*, 2007). The use of branchless banking, defined as using substitute channels of delivering services e.g. mobile phone banking and

agent banking, has been widely embraced by banks especially in Kenya and many other third world countries. These channels are responsible for reaching the unbanked especially in the rural areas and improving their well-being in the This study was guided by the following theories; Technology Acceptance Model, Agency Theory and the Schumpeter Theory of Innovation.

Technology Acceptance Model revolves around a person's behavior and their intention to use ICT. The theory stipulates that an individual's actual behaviour is largely influenced by their intention to use technology, which is also an indication of the attitude of the user towards that technology and how they perceive that technology to be of use to them.

Agency theory deals with the relationship between a firm's owners and the managers who are actually act on behalf of the owners. The major concern of this theory is whether it is practically possible to institute measures in the market that would ensure managers take actions that would result in maximization of benefits for the owners of the firm especially in cases where there is a demarcation between owners and managers. Schumpeter (1928) posits that business people can introduce new opportunities for tapping into new revenues by creating new innovations. This however also attracts groups of imitators rushing after profits and thereby begin investing in imitations that deprive the genuine entrepreneurs the much needed profit margin resulting from the innovation.

These theories are relevant in that financial innovation in the Kenyan banks have adopted technology as the main form of innovation and also the manager of the bank operate on behalf of the real owners.

According to Weru (2010), the banking system in Kenya has not been left behind in all these inventions and innovations. Majority of the financial innovations adopted by commercial banks in Kenya are the use of debit cards and credit cards. These have registered continuous growth from the late 1990s. This has ensured the use of electronic money, which is a shift from the physical cash payments made in small value but also deposits from banks through holding electronic money balances (Anderloni, Llewellyn & Schmidt, 2009).

There is also the utilization of internet and mobile banking. According to Mwangi (2007), commercial banks use mobiles phones as their platform for financial services. It is a service of mobile banking that allows customers access to bank services and products using their mobile phone. This has significantly reduced the available amount of money which individuals used to have at hand at any given time, thereby affecting the demand for money.

1.1.1 Financial Innovation

Allan and Gale (2014) contend that financial innovation can be described in terms of introducing new instruments of finance, services or practice, introduction of new uses for money, discovering new channels of funds, introducing new ways of handling daily operations, or coming up with a new organization, while all these endeavors are becoming part of existing financial institutions, and the emergence of phenomenal growth of new institutions of finances and new markets. These innovations may include products or process variants. White and Frame (2008), define financial innovation as a new product that significantly brings down costs, averts risks, or presents a better product that

is more satisfying to the end user in the financial system. Agosin (2009) differentiates between three categories of innovation: System innovation where there is an emergence of institutions that were not there before, and are tailored to address the unmet needs. Process innovation, which brings into existence new technologies for provision of financial services, and product innovation, which addresses the supply side of the already created financial products. Therefore, governments in this chain are supposed to participate in the first type of innovation since the private sector may under-produce such innovations. Systemic innovation may eventually come up although this may take time; the process may as well be lengthy and tedious, hence, governments have a duty to nurture this growth.

In Kenya, there has been vertical integration with mobile phone financial services and commercial banks. Mobile phone operators in Kenya provide financial services known as M-Pesa by Safaricom, Orange Money by Orange and Airtel Money by Airtel. Presently, the market size of the mobile stands at 19 Million users transacting about KShs. 2 billion every day. 17 million of these subscribers use the M-Pesa platform. These service providers have entered into partnerships with commercial banks e.g. Equity Bank, I&M Bank, KCB, Barclays Bank and Co-operative Bank in offering mobile based financial products aiming at reaching the population that is unbanked (CBK, 2015).

Automated Teller Machine is a service that provides an avenue for banks to improve their services through new models of service and introducing new products to their clients. (Henderson *et al.*, 2003). The availability of these automated services and the acceptance by banks to use the services will no doubt shift dramatically the traditional ways previously used to interact with and maintain personal relationships with individual

clients (Weru, 2010). Francesca and Claeys (2010), refer to agency banking as not an entirely new concept in the world. Latin America and Asia have for long used this service. In Africa the concept is relatively new as only a few countries have embraced the concept of agency banking. In Kenya, it was first introduced in 2010, with the enactment of the policy guidelines. The process requires banks to seek authority from the central bank of Kenya in order to be allowed to engage in this form of business.

Essinger (2009) summarizes the idea behind internet banking as one aimed at “giving customers the ability to access to their bank accounts through a website and while still there allow them to carry out certain transactions on their account, while at the same time complying with the laid down stringent security measures”. According to the Central Bank of Kenya (2015), the larger banks in Kenya have continued to invest heavily in internet banking services tailored to suit individuals and also allowing them to consolidate all their accounts on a single platform.

1.1.2 Financial Performance

Performance refers to the organization’s ability to create and manage its resources in a number of ways in order to attain competitive edge (Iswatia & Anshoria, 2007). Performance is mainly evaluated in two ways; financial and non-financial. Financial performance concentrates on activities that directly impact its financial report while non-financial performance focuses on the activities that improve the internal efficiencies of the firm. Financial performance, variously referred to as profitability evaluates the extent to which a firm generates a profit from the factors of production i.e. labor, management and capital. It involves analyzing the link between revenue and expenses and or the size

of profits gained in relation to amount invested in the business (Gilbert & Wheelock, 2007). In many firms, financial indicators are adopted to measure performance (Grant *et al.*, 2008). Return on assets (ROA) is a common indicator adopted by firms (Allen & Gale, 2014). Financial performance analysis also entails the method of forming the operations and financial features of a firm as reported by the auditors in the firms' books of accounts and statements. This in essence helps to measure efficiency and performance of the managers of the firm (Achrol & Etzel, 2013). In this study, financial performance was measured using Return on Assets (RoA).

1.1.3 Financial Innovation and Financial Performance

There are various transformations that have taken place in the Kenyan banking industry since the onset of financial innovations. Today, bank clients enjoy faster, more efficient and more convenient services from their banks. This has specifically been made possible through the use of Information and Communication Technology, in an effort to improve quality of services rendered (Aduda & Kingoo, 2012).

Even though the banks have made headway in service quality improvement through these innovations, they also have had to part with a considerable amount of their resources. This has greatly impacted these banks' balance sheet. Investment in technology has become the second expense after personnel costs. It has also earned the title of the fastest growing expenditure item in a number of banks. Technology also has its own challenges e.g. the so called plastic money is usually prone to loss or being counterfeited and the counterfeits used to access original card holders accounts (Arnaboldi & Claeys, 2008).

It is therefore paramount for banks to monitor and reduce costs and risks brought about by electronic banking. Financial innovations can only be beneficial to banks if they are created as a result of sound analysis of such risks and costs so that the bank is shielded from unnecessary costs which negatively impact their productivity. Whereas efficiency and effectiveness of electronic banking has a direct impact on bank performance, strict measures are supposed to be adopted in order to avert the associated losses and risks (Gupta, 2008). The banks will need to strike a balance between the two areas so that their financial health is not impaired. This will only be fully realized when the overall effects of this innovation on the banks and its customers are understood.

1.1.4 Commercial Banks in Kenya

The sector is regulated by the Central bank of Kenya. Currently, banking is basically innovative banking. Innovation in banking has been necessitated by changes in technology coupled with unprecedented competition. Innovation has focused on the processes, products and the market. The commercial banks vary from one another in terms of asset book, customer base and geographical coverage. In an effort to increase the stakeholders' investment confidence, firm reputation and value to investor, the commercial banks have embraced financial innovation as a means of driving their performance (Mabrouk & Mamoghli, 2010). There are 43 commercial banks in Kenya.

Information technology has made available numerous inventions and innovations in the banking sector. The main focus of these innovations is to ensure that the customers are satisfied with the services provided. The various platforms which have been made available by these technologies has simplified banking while at the same time making it

more efficient. This has in turn meant that control of operations for the service providers has been eased while costs have gone down thereby improving profitability.

1.2 Research Problem

Financial markets are becoming increasingly integrated and globalized, which has resulted in the demand for new types of investments. Financial innovation has become the main driver of results in the banking sector. Banks are also facing the threat of existent of deposit taking financial institutions which mainly target the rural populace. Financial performance is therefore significant to the growth of banks (Achrol & Etzel, 2013). There has been a rising curiosity in the study of financial innovation. However, there has been relatively few studies that have addressed the same. Frame and White (2008) observes that the greatest challenge to the study of financial innovation practices is not having enough data. He attributes this state of affairs to the fact that this is an emerging field that is attracting many innovators attention and thereby having to cope with new products on an ongoing basis. This has largely revolutionized service delivery since new techniques of operation keep joining the market.

Further, the little literature that is available has mainly focused on the innovations in the finance industry in the advanced economies. Only a few studies have been directed to these innovations in the developing economies. In spite of the importance of these financial innovations in the understanding of how banks operate, the effects on such performance is still a grey area for the following two reasons, first, there is scanty information on what drives these innovations and the impact of these innovations on the banks' financial performance is yet to be evaluated adequately (Mabrouk & Mamoghli,

2010). Several studies have looked at financial innovations and revealed mixed outcomes e.g. Rogers (2012) and Franscesa and Steven (2012) observed that banking innovations did not have a major impact on bank performance, also Al-Hawari & Ward (2006) and Mwanja and Muganda (2014) established that banking innovations significantly contributed to bank performance. Carlsson and Stankiewicz (2011) study ignored the antecedents to innovation inside. Mwangi (2007) studied the factors influencing financial innovation of companies listed at the Nairobi Stock Exchange. Githakwa (2011) assessed the relationship between financial innovation and organizational performance of commercial banks in Kenya. These studies did not focus specifically on the financial performance of the commercial banks. There were thus mixed findings from the above studies. This was the impetus behind this study tailored to the Kenyan economy and with a focus on the commercial banks in order to establish the effect of financial innovations on the performance of commercial banks in Kenya.

1.3 Research Objective

To determine the effect of financial innovation on financial performance of commercial banks in Kenya.

1.4 Value of the Study

The study would enable researchers to understand the relationship between financial innovation and bank's financial performance. It would help researchers learn the effectiveness of the innovations and how the households and Kenyan economy may benefit. The study explains benefits of financial innovation and how it may transform banks' performance. At the policy level, this study may also benefit the Central Bank of Kenya in making policy decisions related to financial innovations in the banking industry in Kenya.

The study would also be important to other interested researchers as the challenges encountered in the study may lead to creation of a knowledge gap that may need to be researched on, adding to the literature on the improvement of financial innovations in the banking industry.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the empirical literature, theoretical and conceptual framework on the effect of financial innovation on the performance of commercial banks.

2.2 Theoretical Framework

The Technology Acceptance Model, Agency Theory and Schumpeter Theory of Innovation guided the study.

2.2.1 Technology Acceptance Model

Technology Acceptance Model (TAM) was propounded by Davis (1989). The model revolves around a person's behavior and their intention to use ICT. The theory stipulates that an individual's actual behaviour is largely influenced by their intention to use technology, which is also an indication of the attitude of the user towards that technology and how they perceive that technology to be of use to them.

Nevertheless, attitude of the user towards that technology and how they perceive that technology to be of use to them is usually determined by how easy the user can put that technology into use. Adoption of the TAM model therefore requires that the user understands the end-users needs with regard to usefulness and how user-friendly it is (Pedersen, Leif, Methlie & Thorbjornsen, 2012). According to the model, usefulness and user friendliness influences such users' attitudes towards that service. Davis (2019), therefore suggested that value for any technology is in meeting the users' needs which again depends on their perception of how useful it is rather than an objective assessment.

Those who are opposed to this view disagree with its emphasis on the technical aspect of it while downplaying the very important social aspects of the technology users.

This theory has been adopted in this study as it explains the motivation behind the various financial innovations in the commercial banks.

2.2.2 Agency Theory

Agency theory deals with the relationship between a firm's owners and the managers who are actually the agents for the owners. The major concern of this theory is whether it is practically possible to institute measures in the market that would ensure managers take actions that would result in maximization of benefits for the owners of the firm especially in cases where there is a demarcation between owners and managers. The theory postulates that a principal allows another person referred to as agent to act on his behalf; that is to transact and decide on his behalf in order to ensure that Principal's utility preferences have been maximized. In this sense problems are bound to arise if: Principal and Agent have varied goals; Principal and Agent employ different measures in the evaluation of Agent's performance; Principal and Agent have conflicting sets of information regarding managerial decisions to be made by Agent while representing the interests of Principal; or Principal and Agent have diverse degrees of risk aversion. The most prominent agency problem is the inability of the principals to keep an eye on the agents, perfectly or without additional costs.

Agency problems in commercial banks usually emanates from three key areas: partial ownership of a banking firm by persons who both own and still manage the bank thereby behaving differently from those who are only keen on the maximization of utility; also the use of government-sponsored deposit insurance programs which many times fail to

price insurance coverage incorporating the risk exposure factor of every banking firm, this means that at times the government can choose to delay reporting when such an institution goes bankrupt, this however presents a great risk on the part of the bank since managers and shareholders may opt to chase high-risk investments while attempting to take away resources from the depositors to shareholders; and lastly the presence of dissimilar information occasioned by owners and managers having varied information.

2.2.3 Schumpeter Theory of Innovation

Schumpeter (1928) posits that business people can introduce new opportunities for tapping into new revenues by creating new innovations. This however also attracts groups of imitators rushing after profits and thereby begin investing in imitations that deprive the genuine entrepreneurs the much needed profit margin resulting from the innovation. Schumpeter (1934) underscored the part played by entrepreneurs and how they seek out opportunities for innovative value improving activities that may expand and transform their established sources of income, but he did this with reference to the difference between invention and innovation.

Schumpeter's focus on the history of innovations in banking no doubt appear to advocate for a positive role for innovations in the field of finance, and funding the business projects that brings about the primary wave of growth. Although he devoted a lot of time and effort in studying the role of innovation, Schumpeter was unable to explain the origin of innovation. He focused on how important it was and its role in influencing change.

2.3 Determinants of Financial Performance in Commercial Banks

There are several factors which influence the financial performance of commercial banks.

They include the following:

2.3.1 Capital Adequacy

Capital adequacy is defined as the amount of capital required by a commercial bank to allow them endure the risks e.g. credit, market and operational risks that they are prone to or their ability to withstand potential losses and protect the organization's debtors. Capital represents the amount of own finances available to support a commercial bank's business. A bank's capital acts as a buffer in cases where adverse situations occur within the institution. Additionally, capital establishes liquidity for a commercial bank because the deposits are more fragile and prone to bank runs. Good levels of capital minimize the chances of distress within a banking institution. Capital adequacy is measured based on the capital adequacy ratio (CAR) (Nyanga, 2012).

CAR is determined by the following formula

$$\text{CAR} = \frac{\text{Tier One Capital} + \text{Tier two Capital}}{\text{Risk Weighted Assets}}$$

The minimum accepted CAR is 8%. A lower ratio indicates that the bank is at a higher risk of insolvency from excessive losses. A higher ratio of CAR shows that a bank possesses a higher ability to deal with the risk of insolvency (Muluaem, 2015).

2.3.2. Size of Bank

Size of the bank is normally measured in terms of assets. The results of these studies have also been conflicting since researchers have not been able to agree on whether size

actually influences performance of commercial banks. Goddard *et al.* (2004) identified only slight relationship between the size of a bank and their financial performance.

The size of the commercial bank or any other business entity in terms of the assets is a significant determinant of profitability due to various issues. Commercial banks that have a large asset size are able to expand their operations geographically to regions where competition is not very high or to regions where the market is largely untapped. Such a move would increase the customer base of the bank significantly and this would also lead to increased customer deposits (Goddard *et al.*, 2014). It is important to remember that most of the profits of commercial banks come from the reinvestment of the customer deposits as well as through lending to borrowers. Increased customer deposits mean that the bank has a higher lending capacity. Such a high lending capacity will result in the bank making more money from the loans and thus recording higher profit margins than those commercial banks that have a smaller asset size (Ongore & Kusa, 2013).

2.3.3 Earnings Ability

Earnings ability represents the potential for a bank to realize profits that enable the organization to fund expansion remain competitive and increase its capital. From the bank's regulator viewpoint, earnings ability's essential purpose is to absorb losses and boost the bank's capital. Earning ability can be evaluated using a number of accounting ratios namely return on assets (ROA), return on equity (ROE), and Net interest income margin (NIM), (Ongore & Kusa, 2013). These measures are scored from 1 to 5 rating system. In the context of the earning ability, a rating of 1 shows that a bank has strong earnings that suffice and maintains adequate capital and loan allowance and can effectively support operations. A rating of 5 shows consistent losses in a banking

institution and portrays a distinct threat to a bank's solvency through the erosion of capital (Muluaem, 2015).

2.4 Empirical Review

Several studies have been conducted on the effect of innovations on the financial performance. They have been divided into global and local studies.

2.4.1 Global Studies

De Young *et al*, (2015) studied the effect of internet on output and performance at community banks in Oslo, Norway. The study used the descriptive research design to conduct a survey of 29 banks in the years 2006 to 2010. The variables included use of online accounts, debit and credit facilities. The study used online questionnaires to collect data. Secondary data was gathered from the annual financial reports of the banks. The study found that in comparison to internet banks, the traditional community banks registered lower profits owing to lower business volumes (in terms of deposits and non-interest income) and they also incurred high costs of labor. Nevertheless, the author is also quick to point out that the financial performance gaps are quickly sealed through time due to the effects of economies of scale.

Nader (2011) assessed the effect of banking innovations on the performance of Commercial Banks in Saudi Arabia between 1998 and 2007. The study adopted a descriptive research design to evaluate the impact of the adoption of financial innovations among the banks in Riyadh between 2005 and 2009. Primary data was collected using questionnaires while secondary data was gathered from the financial and annual reports of the banks. He established that the use of mobile phone in banking, ATM networks and

presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi Arabia. Conversely, the study also discovered that the presence of a high number point of sale terminals (POSs), PC banking and the presence of mobile banking failed to improve efficiency in the profits.

Mabrouk and Mamoghli (2010) investigated the financial innovation and performance of banks in Malaysia. Descriptive research design was adopted to evaluate the impact of the adoption of financial innovations among the banks in Kuala Lumpur between 2002 and 2009. The study variables were the two different adoption behaviours, one, the mover in the adoption of the financial innovation and secondly, imitator of the first movers. Data was gathered from 32 officials who were bank managers, using interview guides. Data were analyzed using spearman rank order correlation co-efficient. They discovered that the first mover of the innovation in products increases the profits while the innovation in the process positively affected both the profits and banks became more efficient. The institutions that imitated thereafter did not realize as much profits compared to the first movers.

Malhotra and Singh (2009) evaluated the effect of banking innovations on bank performance and risk among banks in India. The variables were use of plastic cards, use of internet banking and agency banking. The study used data from 82 banks, during the period 1998-2007. Primary data was gathered from the bank managers using interview guides while secondary data was obtained from the annual reports of the banks. The study adopted a descriptive design and used univariate analysis for data analysis. The study found that on average internet banks were bigger, made more profits and were more efficient in operations. Further, internet banks had acquired higher quality assets

and had better management that lowered their expenditure on buildings and other equipment. They also found that a majority of the internet banks in India relied heavily on customer deposits.

Kagan *et al* (2005) evaluated the impact of internet banking on the performance of community banks in America. They sampled a panel of the 60 largest EU banking groups over the period 1995-2005. The study adopted a descriptive design. Data were collected from the financial reports of the banks of interest. Data was analyzed using inferential analysis. The study found that banks that offered a wide range of banking services over the internet performed better than those without. They also discovered that banking over the internet helped the community banks in enhancing their ability to earn as indicated by a higher return on equity. Also their asset quality was enhanced as it reduced the ratio of unsettled assets that were not performing.

Kajewski (2014) studied innovations: benefits, challenges and recommendations for practice in Australia in the banking sector. Descriptive research design was adopted. The study used secondary data from risk manuals, financial products reports and financial reports of 38 banks which were representative of the commercial banks in Australia. The study used correlation analysis, regression analysis and autocorrelation techniques to analyze the data. The study discovered that throughout the years, banks had progressively invested in the various technology platforms in an effort to improve financial access to their clientele. The study also found that the number of transactions had gone up as a result of these innovations. He observed a positive significant effect of innovation on banks profitability in that it reduced the cost of doing business and delivered services that were more efficient to the customers.

2.4.2 Local Studies

Gakure and Ngumi (2013) evaluated the effect of innovations on the profitability of insurance companies in Kenya. They used a descriptive design. The population comprised all the 48 insurance companies in Kenya. The study used both primary and secondary data. Both descriptive and content analysis techniques were employed. They concluded that innovations had a statistically significant influence on firms' profitability. They noted that insurance firms in Kenya had attained over 10 years of improving their capacity to earn and they also controlled costs via adopting innovations e.g. the use of mobile phone technology for promotion of products and the use of agencies.

Kithuka (2012) endeavored to find out the factors that enhanced the expansion of agency banking in Kenya. The study population was all the Equity Bank agencies in operation between 2009 and 2011. The study used a descriptive design. The sample size was 100 Equity Bank agencies engaged in bank transactions in Kwale County. Quantitative and qualitative data were used. He found that agency banking provided the much needed convenience to the users, it was easily accessible, was cost effective and secure and thus was more preferred and was rapidly expanding.

Githakwa (2011) evaluated the degree to which ATM banking had been implemented by the commercial banks in Kenya. He adopted a descriptive research design to survey all the 44 commercial banks in Kenya in the years 2005-2010. The study used secondary data both qualitative and quantitative. Regression and correlation analysis were adopted. He discovered that since the introduction of mobile phone and agency banking, banks have progressively invested in such platforms and reduced dependence on ATMs in an effort to improve financial access to their clientele.

Cheruiyot (2010) assessed the influence of innovations in banking on the financial performance of Kenyan banks. He adopted a descriptive design to measure the internet variable using banking intensity as derived from a web feature data collected from 11 banks' websites between 2004-2009. The study used secondary data which was analyzed using inferential statistics. He measured performance using ROA and ROE variables. The results indicated that internet banking as an innovation had a positive impact on the profits of a bank to a little extent.

Wanjiku (2010) studied the impact of ATM banking on the financial performance of banks in Kenya. She used secondary data available in annual reports for the banks. Descriptive research design was adopted. The study used secondary data from risk manuals, financial products reports and financial reports of 18 banks which were representative of the 43 commercial banks in Kenya. The study used correlation analysis, regression analysis and autocorrelation techniques to analyze the data. The study discovered that throughout the years, banks have progressively invested in ATMs spread across the country in an effort to improve financial access to their clientele. The study also found that the number of transactions had gone up as a result of this expansion.

From the foregoing, it is clear that the above mentioned studies were conducted in the developed world economies. Their findings may not be generalized to cover developing economies like that of Kenya. Further, the local studies were conducted a long time ago. Given the changes that are taking place in the world of technology on any given day, it is important that progressively, studies are done to update the existing literature on financial innovation which this study endeavors to do.

2.5 Conceptual Framework

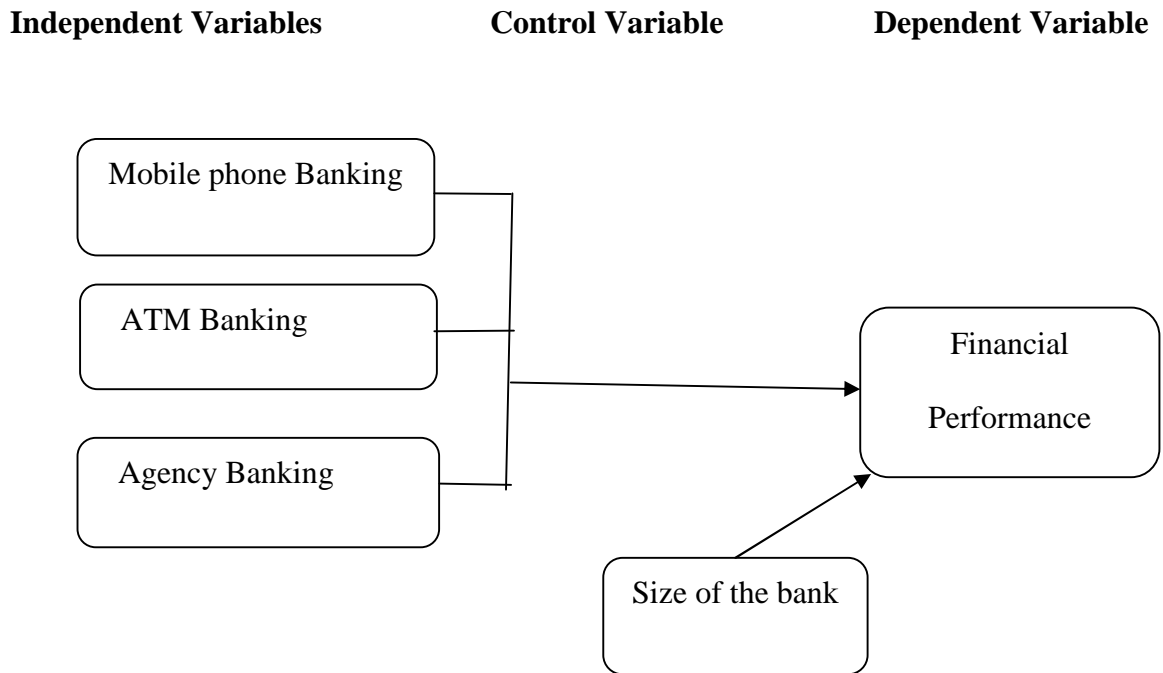


Figure 2.1 Conceptual Framework

2.6 Summary of Literature Review

Malhotra and Singh (2009) evaluated the effect of banking innovations on bank performance and risk among banks in India. They found that on average internet banks were bigger, made more profits and were more efficient in operations. Further, internet banks had acquired higher quality assets and had better management that lowered their expenditure on buildings and other equipment. Nader (2011) assessed the effect of banking innovations on the performance of the Commercial Banks in Saudi Arabia. He established that the use of mobile phone in banking, ATM networks and presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi. De Young *et al*, (2015) studied the effect of internet on output and performance at

community banks in Oslo, Norway. They found that in comparison to internet banks, the traditional community banks registered lower profits owing to lower business volumes (in terms of deposits and non-interest income) and they also incurred high costs of labor.

Locally, Cheruiyot (2010) assessed the influence of innovations in banking on the financial performance of Kenyan banks. The results indicated that internet banking as an innovation had a positive impact on the profits of a bank, to a little extent. Kiriimi (2011) evaluated the degree to which internet banking had been implemented by the commercial banks in Kenya. He discovered that regulations provided by the banks presented a challenge in their enforcement since they seemed to conflict with the overall guidelines provided by the Central bank. Gakure and Ngumi (2013) evaluated the effect of innovations on the profitability of insurance companies in Kenya. They concluded that innovations had a statistically significant influence on firms' profitability.

In summary, this study has argued that financial innovations affect financial performance of banks. Nevertheless, it is not clear how financial innovation in terms of mobile phone, ATM, agency and internet banking affects the profitability of the commercial banks in Kenya which is the gap that this study intends to fill.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the method of research adopted in the study. Also, the research design, population, data collection, validity and reliability, data analysis, analytical model and test of significance as discussed in the subsequent sub-headings.

3.2 Research Design

The study employed a descriptive research design which expresses the situation as it is. This kind of study tries to explain things such as characteristics, values, possible behavior and attitudes (Kothari, 2004).

3.3 Population

The target population of this study was all the 43 commercial banks in Kenya, however from the available data from the Central Bank repository, only 38 banks reported their RoA consistently during the study period. Charter house, Eco bank, Housing Finance and Imperial bank did not report consistently thus they were excluded from the population. Census technique was used. Kothari (2004) postulates that census technique is used when the target population is small.

3.5 Data Collection

The researcher used secondary data. Secondary data was obtained from the published annual reports of the commercial banks in Kenya and the CBK's website, for the years 2012-2016. The study adopted a time series approach in collecting secondary data.

3.6 Data Analysis

The study involved quantitative and qualitative data. It examined the collected data to make inferences; editing to eliminate restatements and for grouping. After the data was checked for completeness, it was thematically coded. The refined quantitative data was analyzed using descriptive statistics involving frequencies, percentages, means and standard deviations.

3.6.1 Regression Model

The regression model specification was as follows; $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$, where

Variable	Proxy	Operational Definition	Measurement	Source
Financial Performance	Y	Ability to create and manage resources in a number of ways in order to attain competitive edge	Net income /Total assets	Iswatia & Anshoria (2007)
Mobile phone Banking	X ₁	Application of mobile phones and related devices to perform banking operations	Value of transactions through mobile phone	Nader (2011)
Agency Banking	X ₂	Use of licensed agents to perform banking operations	value of transactions through bank agents	Francesca & Claeys (2010)
ATM Banking	X ₃	Use of automated teller machines to perform banking operations	Value of transactions through ATMs	Henderson <i>et al.</i> , (2003)
Size of the Bank	X ₄	The total assets held by a specific bank	Total value of assets held	Goddard <i>et al.</i> (2004)

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the data analysis and presentation of findings.

4.2 Descriptive Statistics

The researcher used mean and standard deviation in order to meaningfully describe the study variables.

4.2.1 Financial Performance

The trends of financial performance (percentage Return on Assets) for commercial banks are presented in Table 4.1 for the years 2012 to 2016. The highest ROA was a percentage mean of 3.4769 in year 2013 while the lowest value was a percentage mean of 2.4069 in year 2015. Thus, financial performance improved between 2012 and 2013, then deteriorated between 2014 and 2015 and then went up in 2016. The changes in these values shows an intermittent change in financial performance of the banks. The highest deviation was recorded in 2015 with a value of 2.45793. This was occasioned by negative RoA in some of the commercial banks.

Table 4.1 Financial Performance (ROA)

	N	Mean (%)	Std. Dev.
2012	38	3.3282	2.24979
2013	38	3.4769	1.93166
2014	38	3.1879	2.03488
2015	38	2.4069	2.45793
2016	38	2.6467	2.18959

4.2.2 Mobile Phone Banking

The trends of value of money transacted through the mobile banking platform for the 5 years are shown in Table 4.2. The transactions recorded the highest mean of KShs. 11.4456B in year 2016 and a mean of KShs.11.1084B in 2012. This indicates a constant rise in the value of money transacted through mobile phone banking for the five-year period. This had the implication that use of mobile phone banking steadily rose over the period.

Table 4.2 Mobile Phone Banking

Year	N	Mean (KShs. in Billions)	Std. Dev
2012	38	11.1084	.03448
2013	38	11.1997	.04075
2014	38	11.2948	.03210
2015	38	11.3693	.03381
2016	38	11.4456	.02986

4.2.3 Agency Banking

The trends of value of money transacted through agency banking platform for the 5 years are shown in Table 4.3. The transactions recorded the highest mean of KShs. 11.4456B in year 2016 and a mean of KShs.11.1084B in year 2012. This was an increase in the value of money transacted through agency banking by the commercial banks for the five years.

Table 4.3 Agency Banking

Year	N	Mean (KShs in Billions)	Std. Dev
2012	38	10.3381	.04921
2013	38	10.4573	.04341
2014	38	10.6457	.03324
2015	38	10.7418	.01305
2016	38	10.8209	.02855

4.2.5 Automated Teller Machine (ATM) Banking

The trends of value of money transacted through ATM banking platform for the 5 years are shown in Table 4.4. The transactions recorded the highest mean of KShs. 10.1548B in year 2013 and a mean of KShs. 8.9122B in 2016. This showed a decline in the value of money transacted through Automated Teller Machines (ATMs) by commercial banks in Kenya between year 2012 and year 2016. This may perhaps have been occasioned by the

presence of other banking platforms e.g. mobile phones and agency banking which are easily accessible compared to ATMs.

Table 4.4 Automated Teller Machine (ATM) Banking

Year	N	Mean (KShs in Billions)	Std. Dev
2012	38	10.1157	.02623
2013	38	10.1548	.03594
2014	38	9.4584	.23723
2015	38	8.9316	.03415
2016	38	8.9122	.03971

4.3 Inferential Statistics

In order to assess the relationship between the study variables, a regression analysis was conducted and the results were as follows:

4.3.1 Model Summary

Coefficient of determination (R square) indicates the variation in the dependent variable that is influenced by the independent variables. The three independent variables studied i.e. mobile phone banking, agency banking and ATM banking, explain 77.79% of variance in financial performance as represented by the R^2 . Thus other factors not part of this study contributed 22.21% of variance in the dependent variable.

Table 4.5 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.882	0.7779	0.756	0.0221

a. Predictors: (Constant), mobile phone banking, online banking, agency banking and ATM banking

b. Dependent Variable: financial performance

4.3.2 ANOVA (Analysis of Variance)

Analysis of Variance (ANOVA) consists of calculations that provide information about levels of variability within a regression model.

Table 4.6 ANOVA (Analysis of Variance)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.768	3	4.074	7.32	.012 ^a
	Residual	24.332	34	2.653		
	Total	37.1	37			

a. Predictors: (Constant), mobile phone banking, agency banking and ATM banking

b. Dependent Variable: financial performance

From the study findings in Table 4.8, the significance value is 0.012, hence the model was significant in predicting how mobile phone banking, agency banking and ATM banking influenced the profitability of commercial banks. An F-test measures the F-

distribution. It is used to determine whether a model is fit to test data. The F statistic in this study was 7.32 thus the model had a good fit.

4.3.3 Regression Analysis Results

The regression equation was modelled as shown on Table 4.7

Table 4.7 Regression Coefficients

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
1 (Constant)	3.142	.826		7.484	0.0000
Agency banking	0.742	.278	0.146	2.669	0.0110
Mobile phone banking	0.815	.289	0.126	2.820	0.0075
ATM banking	0.476	.205	0.142	2.322	0.0255

Therefore; substituting the regression model $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$

Becomes: $Y = 3.142 + 0.742X_1 + 0.815X_2 + 0.476X_3 +$

In the equation, taking all factors (mobile phone banking, agency banking and ATM banking) constant at zero, the financial performance of the banks, as measured by Return on Assets would be 3.142%. Also, the study discovered a significant positive relationship between mobile phone banking and financial performance ($\beta = 0.815$ and P value < 0.05); meaning that a unit increase in mobile phone banking leads to a 81.5% increase in financial performance.

The study also discovered a significant positive relationship between Agency banking and financial performance ($\beta = 0.742$ and $P \text{ value} < 0.05$); meaning that a unit increase in Agency banking leads to 74.2% increase in financial performance.

The study further discovered a significant positive relationship between ATM banking and financial performance ($\beta = 0.476$ and $P \text{ value} < 0.05$); meaning that a unit increase in ATM banking would lead to 47.6% increase in financial performance.

4.4 Discussion of Findings

The trends of value of money transacted through the mobile banking platform for the 5 years recorded the highest mean of KShs. 11.4456B in year 2016 and a mean of KShs. 11.1084B in year 2012. This showed an improvement in value of money transacted through agency banking by the banks for the years 2012 to 2016. Therefore, mobile phone banking had a positive influence on the banks' financial performance for that period. The findings agree with those of the Central Bank of Kenya (2015) report that indicated that a good number of the banks had continuously invested in mobile phone banking while the smaller ones were following closely in an effort to improve profitability.

The trends of value of money transacted through the agency banking platform for the 5 years recorded the highest mean of KShs. 11.1084B in year 2016 and a mean of KShs. 11.1084B in year 2012. This showed an improvement in the value of money transacted through agency banking by the banks from the years 2012 to 2016. Therefore, agency banking had a positive influence on the banks' financial performance for that period. These findings resonate with those of Kithuka (2012) who observes that agency banking

provides the much needed convenience to the users, it is easily accessible, is cost effective and secure and thus is more preferred and is rapidly expanding.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Discussed in this chapter are the summary, conclusion and recommendations of the study under the following sub- headings.

5.2 Summary of Findings

The trends of value of money transacted through the mobile banking platform for the 5 years recorded the highest mean of KShs. 11.4456B in year 2016 and a mean of KShs. 11.1084B in year 2012. This was an increase in the value of money transacted through agency banking by the commercial banks in Kenya between year 2012 and year 2016. Therefore, mobile phone banking had positively impacted the banks' financial performance for that period.

The trends of value of money transacted through agency banking platform for the 5 years are recorded the highest mean of KShs.11.1084B in year 2016 and a mean of KShs. 11.1084B in year 2012. This was an increase in the value of money transacted through agency banking by the commercial banks for the five years. Therefore, agency banking had positively impacted the banks' financial performance for that period.

The trends of value of money transacted through ATM banking platform for the 5 years recorded the highest mean of KShs. 10.1548B in year 2013 and a mean of KShs. 8.9122B in 2016. This showed a decline in the value of money transacted through Automated Teller Machines (ATMs) by commercial banks in Kenya between year 2012 and year

2016. This may perhaps have been occasioned by the presence of other banking platforms e.g. mobile phones and agency banking which are easily accessible compared to ATMs. Therefore, ATM banking had little impact on the on the banks' financial performance for that period.

5.3 Conclusion

From the regression model, the study discovered a significant positive relationship between mobile phone banking and financial performance in that a unit increase in Agency banking leads to 81.5% increase in financial performance. The study therefore concludes that mobile phone banking positively impacted the profitability of the banks.

Further, from the model, the study discovered a significant positive relationship between agency banking and financial performance in that a unit increase in agency banking leads to 74.2% increase in financial performance. The study therefore concludes that agency banking positively impacted the profitability of the banks.

The study discovered a significant positive relationship between ATM banking and financial performance of the banks. This meant that a unit increase in ATM banking would lead to 47.6% increase in financial performance, the study therefore concludes that ATM banking positively impacted the banks' performance. Also, the banks invested in alternative banking platforms e.g. mobile phones and agency banking which were more easily accessible compared to ATMs.

5.4 Recommendations

There was a significant positive relationship between mobile phone banking and financial performance for the 5 year period and the resulting increased financial performance of

the banks, therefore the study recommends that commercial banks ought to enter into more partnerships mobile phone services providers in an effort to ensure their customers continue to adopt the use of the platform in order to enhance financial performance.

There was a significant positive relationship between agency banking and financial performance for the 5 year period and the resulting increased financial performance of the banks. Therefore the study recommends that the banks should put more resources in ensuring that they partner with more agents especially in the rural areas where they do not operate branches so that they reach the unbanked.

There was a significant positive relationship between ATM banking and financial performance for the 5 year period and the resulting increased financial performance of the banks. Also, the banks invested in alternative banking platforms e.g. mobile phones and agency banking which are more easily accessible compared to ATMs. The study therefore recommends that the ATM networks be further increased especially in areas where no such facilities exist, in order to reach more people.

5.5 Suggested Areas for Further Research

This study focused on mobile banking, agency banking and ATM banking as financial innovations, thus a similar study should be done in other countries in order to compare the findings.

This study focused on mobile banking, agency banking and ATM banking as financial innovations. A study should be conducted to explore the challenges facing the banks that are implementing these innovations.

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APPENDIX I: COMMERCIAL BANKS IN KENYA

1. African Banking Corporation
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. Stanbic Bank
7. Chase Bank Ltd
8. Citibank, Nairobi
9. Co-operative Bank of Kenya
10. Commercial Bank of Africa
11. Consolidated Bank of Kenya
12. Credit Bank
13. Development Bank of Kenya
14. Diamond Trust Bank, Nairobi
15. Dubai Bank
16. Equatorial Commercial Bank
17. Equity Bank
18. Family Bank
19. Fidelity (Commercial) Bank
20. Fina Bank
21. First Community Bank
22. Giro Commercial Bank
23. Guardian Bank
24. Gulf African Bank
25. Habib Bank A.G. Zurich
26. Habib Bank Ltd
27. Housing Finance
28. Imperial Bank
29. I&M Bank
30. Sidian Bank
31. Kenya Commercial Bank
32. Middle East Bank
33. National Bank of Kenya
34. National Industrial Credit Bank
35. Oriental Commercial Bank
36. Paramount Universal Bank
37. Prime Bank
38. Southern Credit Bank
39. Standard Chartered Bank
40. Trans-National Bank
41. UBA Kenya Bank
42. Victoria Commercial Bank
43. Jamii Bora

Source: Central Bank of Kenya (2017)

APPENDIX II: RETURN ON ASSETS

	2012	2013	2014	2015	2016
KCB	7.4	7.7	5.93	5.01	5.64
Equity	5.2	5.5	7.26	6.56	6
Co-operative	7	6	6.42	4.14	5.15
Standard Chartered	5.9	5.8	4.43	5.01	5.1
Barclays	4.8	4.7	5.44	3.83	4.02
Diamond Trust	10.4	4.1	5.64	5.66	3.64
I&M	5.2	5.5	4.31	3.56	7.27
Commercial Bank of Africa	3.5	4.9	4.47	3.69	5.6
Stanbic	4.9	4.6	4.44	3.99	3.37
Citibank	4.2	7	2.57	3.14	5.84
NIC	4	3.6	5.22	6.33	3.66
Bank of Baroda	5.5	4.8	3.08	3.55	4.67
Prime Bank	3.6	5.8	4.35	3.99	3.57
Bank of India	2.7	2.9	4.75	3.65	4.57
HFCK	2.7	3.8	4.24	3.49	2.12
Victoria Commercial Bank	1.7	1.9	1.9	4.42	3.55
Gulf African Bank	2.7	4	4.18	3.38	2.78
Guaranty Trust Bank	1.3	4.1	3.74	1.86	2.23
Family Bank	2.4	2	4.61	2.72	0.91
Habib Bank AG Zurich	2.9	4.3	2.08	3.53	3.65
Giro Bank	4.8	2.9	5.29	4.74	3.7
Habib Bank Limited	6.5	4.2	3.68	3.03	3.94
Guardian Bank	4.2	6.2	3.11	1.61	2.05
African Banking Corporation	2.8	4.3	5.63	2.25	0.99
National Bank	2	2.7	3.13	2.39	0.14
Transnational Bank	3.7	3	2.59	1.05	1.53
Credit Bank	3.2	2.8	1.49	1.6	2.3
Paramount Bank	2.9	2.5	1.88	0.18	1.11

Development Bank	1.9	1.8	1.8	0.35	0.58
Sidian Bank	1.7	2.3	0.33	0.75	0.3
UBA	1	1.8	1.86	0.49	0.89
Oriental	1.8	2.5	1.32	0.22	0.36
Bank of Africa	0.8	1	0.67	0.07	-0.03
First Community Bank	0.9	1.2	0.73	-1.74	-0.28
Middle East Bank	1.2	1.3	1.07	-1.84	-1.93
Consolidated Bank	1.3	1.4	1.28	-3.91	1.99
Jamii Bora	1.5	1	0.21	4.53	3.12
Ecobank	-1.2	-0.8	-1.82	-1.34	0.13
	3.39	3.56	3.25	2.52	2.74

APPENDIX III: VALUE OF MOBILE PHONE TRANSACTIONS

Month	Value of Transaction (in KShs. Billions)				
	2012	2013	2014	2015	2016
Jan	114.06	142.653	178.478	210.54	243.37
Feb	116.691	141.126	172.797	208.132	257.185
Mar	126.093	141.126	192.695	231.836	273.585
April	117.36	142.609	186.664	213.746	269.82
May	128.403	158.77	198.131	230.152	277.94
June	124.02	152.5	189.911	227.921	270.973
July	129.28	162.76	200.992	238.864	281.854
Aug	131.38	168.1	206.72	248.154	296.908
Sept.	130.69	165.59	206.341	247.506	283.85
Oct	137.68	175.29	210.277	255.808	292.092
Nov.	138.99	175.22	203.239	236.372	291.227
Dec	150.16	182.495	225.549	267.068	316.773
	1544.807	1908.239	2371.794	2816.099	3355.577

APPENDIX IV: VALUE OF AGENCY BANKING TRANSACTIONS

Month	Value of Transaction (in KShs. Billions)				
	2012	2013	2014	2015	2016
Jan	19.92	24.6984	35.675	53.4068	60.34
Feb	17.399	25.0338	44.564	53.4683	60.03
Mar	19.975	26.915	42.342	52.3949	62.71
April	21.6891	26.9108	45.282	53.561	64.71
May	23.975	26.8233	43.309	55.962	63.43
June	20.0767	28.2047	43.152	54.877	68.27
July	20.8087	28.5462	44.817	55.21	68.72
Aug	21.072	29.4457	46.378	56.293	69.1378
Sept.	24.0758	32.7301	46.257	56.198	67.0519
Oct	25.0212	32.4507	47.874	55.993	65.5934
Nov.	24.6933	31.3186	46.234	56.773	73.9817
Dec	24.214	32.4254	46.262	57.349	72.0955
	262.9198	345.5027	532.146	661.486	796.0703

APPENDIX V: VALUE OF ATM BANKING TRANSACTIONS

Month	Value of Transactions (in KShs. Billions)				
	2012	2013	2014	2015	2016
Jan	15022	16513	801	976	1077
Feb	13540	15207	1011	870	1075
Mar	13712	15430	3752	902	1086
April	13081	14833	3522	894	1095
May	13375	15133	3509	889	877
June	12500	13180	3477	889	890
July	12273	12832	3426	853	890
Aug	13256	15034	3888	852	908
Sept.	12413	13897	3781	826	908
Oct	13099	13668	3830	846	895
Nov.	12085	12762	3451	739	948
Dec	12536	13441	3646	743	913
	156892	171930	38094	10279	11562