EFFECT OF FINANCIAL INNOVATION ON MARKET CAPITALIZATION OF LISTED COMMERCIAL BANKS IN KENYA

MUTHOKA NICODEMUS ITIVI

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Effect of Financial Innovation on Market Capitalization of Listed Commercial Banks in Kenya

Muthoka Nicodemus Itivi

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature …… Date …….

Muthoka, Nicodemus Itivi

This thesis has been submitted for examination with our approval as University Supervisors.

Signature …… Date …….

Dr. Oluoch, Oluoch, PhD

JKUAT, Kenya

Signature …… Date …….

Dr. Paul Munene Muiruri, PhD

MUA, Kenya

DEDICATION

This thesis is dedicated to my Dad and Mum for bringing me up and taking me to school. Further, I dedicate this thesis to my wife Rose and my Children Jeremy and Terry. Many are the times they missed my attention as I spent many hours in the study room preparing this thesis. This study will be a source and impetus of motivation and inspiration for great deal of effort and endurance to my children when they grow.

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LIST OF ABBREVIATION AND ACRONYMS

AFI	Alliance for Financial Inclusion
ANOVA	Analysis of Variance
ATMs	Automated Teller Machines
CBK	Central Bank of Kenya
EFT	Electronic funds transfer
EMH	Efficiency Market Hypothesis
EU	European Union
FEM	Fixed effects model
LNAB	Natural Logarithm value of transactions through Agency banking
LNIB	Natural Logarithm of the total value of transactions through Internet Banking
LNMB	Natural Logarithm of Mobile Banking value of transactions
LNMC	Natural Logarithm of Market Capitalization
LNPCC	Natural Logarithm of Plastic Credit Card innovations value of transactions
MIS	Management Information system
MUA	Management University of Africa
NSE:	Nairobi Securities Exchange
NYSE	New York Stock Exchange
OLS	Ordinary Least Square
PIN	Personal Identification Number
POS	Point of Sale

REM	Random-effects model
ROA	Return on Assets
ROE	Return on equity
RTGS	Real Time Gross settlement
SPSS	Statistical package for social sciences

DEFINITION OF TERMS

Agency banking business: As permitted by CBK, this is a business carried out by an agent on behalf of an institution (CBK, 2012).

Commercial bank: It is a financial institution that is dedicated to provide financial services, for instance, giving business loans, accepting deposits and loans, mortgage lending, and basic investment products like certificates of deposit and savings accounts (CBK, 2015).

Financial Innovation: Consists of organizations coming up with new products or new production processes to make their operations better, in which case the new products could be based on the new processes (Tufano, 2002).

Internet banking: Is a system that enables persons to do banking activities through the internet/online (Atanassov, Nanda, & Seru, 2007).

Listed Commercial banks: These are banks that are listed on a publicly trading stock market like the Nairobi Securities Exchange (NSE, 2018).

Market Capitalization: Also referred to as a market cap, is the value that investors place on aa company at a given point in time, as represented by the total value of a currency shares outstanding of a company's stock. It is computed as the current market price of a share multiplied by the outstanding shares of a company (Oslon, 2005)

Mobile banking: This refers to the process of performing banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (Boston Consulting Group, 2009).

Moderating Variable: This is a third variable that a moderator is a third variable that affects the correlation of two variables (Francesca & Claeys, 2010).

Plastic Credit Card innovation: Innovations on the introduction of a plastic card that is used to borrow funds or buy goods and services repeatedly on credit (Francesca & Claeys, 2010).

ABSTRACT

There has been a notable paradigm shift in the financial sector in recent years. Increasingly new financial innovation products and processes have been introduced in the banking industry. There are still confounding findings on the effect of financial innovations on investor value despite the undeniable significance of financial innovations. Some empirical studies have reported a positive relationship between financial innovations and Market capitalization, whereas others have reported a negative relationship. The prime objective of this study was to determine the effect of financial innovation on the market capitalization of the Kenyan NSE listed banks for five years from 2013 to 2017. In finance theory, the Modigliani theoretical preposition, Efficient Market Hypothesis, and Random Walk theories of market prices concur that prices of the securities in a stock market are difficult to be predicted. Other theories of financial innovation that have reported existence a link between financial innovation and market value include Schumpeter theory, Silber's theory, Transaction cost theory, and Market efficiency theory. The study explicitly centered on the effects of; Agency banking, Mobile banking, Plastic credit card innovation, and Internet banking on the market capitalization of listed commercial banks in Kenya. The study additionally assessed the moderating effects of Bank ownership on the relationship between the effect of financial innovation and Market capitalization of listed commercial banks in Kenya. The target population of this study was all the 11 NSE listed commercial banks in Kenya as of 31st December 2017. The decision to target the 11 banks was because they were listed in NSE, and subsequently, the estimation of market capitalization can only be acquired from publicly trading companies. Census research was therefore adopted as the design. Financial data of the independent variables were obtained from banks published quarterly reports available in Nairobi Securities Exchange. Market data on share prices and outstanding shares was obtained from NSE for the period between 2013 and 2017. The data that was obtained was then cleaned, coded, and statistical outputs generated using SPSS, STATA, and EVIEWS statistical software. To analyze the data, descriptive and inferential statistics were produced using panel data models. Granger causality test was also used to examine causality among the variables. The findings revealed that financial innovations, namely: Plastic Credit card innovation and Internet Banking, had a statistically significant positive effect on the market capitalization of listed commercial banks in Kenya. The findings also revealed that Agency Banking and Mobile Banking had a positive effect on Market Capitalization, though not statistically significant. The findings also revealed that bank ownership (local or foreign) did not have a moderating effect on the relationship between financial innovations and market capitalization of listed commercial banks in Kenya. Since the overall random-effects model involving all the financial innovations against market capitalization was significant, it was concluded that financial innovations had a significant effect on the market capitalization of listed commercial banks in Kenya. It is therefore recommended to the policymakers of commercial banks, both the Government and the management, to embrace financial innovations. Correct measures such as favourable laws and regulations should be created to allow a favourable environment for the adoption of financial innovations. This study has not exhausted all financial innovations, and therefore, further study is recommended to include other financial innovations.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Innovation is vital to any sector in the modern economy, as stated by Frame and White (2009). For an innovation to be considered successful, then it must bring about a reduction in risks and expenses or costs. It should also lead to an improvement in services and products hence adding value to the users. Notwithstanding, some activities of financial innovation may cause significant risks that should not be ignored.

Companies adopt new production processes and new products to make their operations better, which would, in the end, bring about new products, which is referred to as innovation (Tufano, 2002). In the sector of Finance, Nofie (2011) defines innovation as the entrance of completely new and better produce and a method that reduces the price of executing financial services that are in existence. Mathews and Thompson (2008) define financial innovation as a term used many times to describe any variation in scope, service delivery in the industry of finance. This is achieved through banks opening doors to new services and products as well as letting in a myriad of new risks associated with these services.

Tufano (2002) states that financial innovation is a process of building and then promoting new instruments as well as institutions, markets, and technologies in the industry of finance. According to Lawrence (2010), in financial discipline, innovation consists of the development, design, and the execution of innovative financial processes and instruments, and the creation of innovative answers to financial problems. According to Ignazio (2007), innovations in finance can be categorized into new products (e.g., exchange-traded index funds, adjustable-rate mortgages, etc), services such as; Internet banking and trading in online securities; new production methods such as records for securities that are electronic, credit scoring or new forms of organizations such as new electronic exchange devices for trading in securities and also Internet-only banks. Financial innovation has brought

about an increase in new players and new services and products offered to customers in the market. Further, there have been openings in new opportunities where the sector participants have benefited (Noyer, 2007).

In the finance sector, innovation is regarded as a process of producing new instruments, technologies, markets and institutions in the finance sector. Consequently, this enables easy access to payment and trading information (Solans, 2003). According to Lerner (2006), Financial innovations are paramount to both organizations in the financial services business as well as companies in other sectors in various ways; for example, innovations aid in raising a large amount of capital with minimized cost. Again, innovation is a critical phenomenon in all sectors of a modern economy.

Burnett (2011) asserts that eventually, Innovation is the thing that makes a business to be able to thrive in a business world that is constantly changing. Client desires are rising, and contenders are working more enthusiastically than at any other time to contend over an expanding number of channels, frequently in a worldwide commercial center. Birenjan (2010) stated that innovations such as electronic funds transfer, automatic teller machines (ATMs), real-time gross settlement, Debit & Credit cards, Retail Banking, payments of utility bills, free services of advisory, customer implementation of standing instructions, telephone, internet, banking, and mobile banking, selling insurance products, issue of free cheque books, and many more value-added services are one among the various innovations in the banking and financial sectors.

According to OECD Oslo (2005), four types of innovations are introduced, namely: products, marketing, process/method, and organizational innovations. OECD Oslo (2005) continues to state that:

Product innovation refers to the invention of new services or goods or significantly better products or services regarding their features or the uses they are intended for, including notable positive changes in components and materials, user-friendliness, technical specifications, incorporated software, or other functional characteristics.

Process innovation refers to the execution of a notably improved, new, or advanced process of production or delivery, including notable changes in software or equipment as well as techniques. These innovations can aim at decreasing unit production/ delivery costs to better the quality or to create or deliver new or notable improved or advanced products. Fagerberg, Mowery and Nelson (2004) insisted that there is a significant positive of financial innovation on income growth and employment; process innovation, due to its cost-cutting nature, can have an unclear effect.

Market capitalization is the firm value in an open economy. Depending on the supply of shares and investor demand, a company's market capitalization oscillates during the period that it is trading. Company size, return potential, and risk are salient factors to consider in making a long-term investment strategy. This understanding makes an investor construct a balanced stock portfolio composed of a mix of market caps. Consequently, market capitalization enables an investor and the bank to know its current affordability. When a company investor or an individual investor is buying company shares or security, the market value becomes one of the paramount factors to consider. Many investors choose securities or assets depending on the differences between the worth of security perception and market value. Market value is therefore represented by the market capitalization of the totality of outstanding shares of a company. It can be regarded as an alternative to the company's net worth by investors and therefore becomes a predominant factor in stock valuation (Chessar, 2015).

Market capitalization is a continuous valuation in the market of a public firm whose shares are publicly traded on a stock exchange. It is calculated by multiplying the total number of outstanding shares of the shareholders with the current market price per share at a given time-span. The computation of market capitalization is a key part of any stock valuation formula. This is because it represents market value in the totality of a company's total outstanding shares. As outstanding stock or share is sold and bought in the stock exchange markets, market value in many cases is used as a representative of public opinion about a company's worth in net. It is also a critical factor in some forms of valuing stock. Market capitalization is used as a consensus

on the value of equity of a company by the public. According to Kaundal and Sharma (2010), interest in ownership is freely traded that is sold and bought through purchases and sales of stock. This provides a mechanism in the market, which is used to determine the prices of company shares.

Daily changes in stock value give openly accessible data on the wellbeing of a publicly-traded organization. It represents the view of the general population on the estimation of an organization's equity. A productive security exchange theory states that any stock cost can mirror all crucial data about an organization that is recorded or present whether public or it is private.

As per Claessens and Laeven (2010), Central Bank Regulatory change was driven by many inter-related variables, including the decreasing adequacy of traditional controls because of financial innovations (counting the difficulty in separating local markets) and fast innovative improvement. Regulatory reform expanded the competition role, which in this way prodded decreases in margins of financial services and raised productivity by driving the exit or combination of generally wasteful company's and by empowering innovation.

1.1.1 Global Perspective

Globally, most studies on the association of innovation and market capitalization have been inconclusive empirically and have produced contradictory findings. Loof (2002) in a study to investigate the relationship between innovation output as the dependent variable which was measured using new sales of products per employee with five various measures of organizations performance namely: employment growth, employee sales, value-added, return on assets and operating profit as the variables found out that there was a significant positive link between all the five indicators and financial innovation. However, this was not the case in all studies carried out as others indicated the absence of a significant relationship. For instance, in a study carried out by Klomp and Leeuwen (2001) concluded that innovation output has a significant positive effect on employment growth. Further, in research by Kemp (2003) on the link between innovation and the growth of turnover,

employment and profit, found out that innovation had an insignificant and negative effect on profit.

Bloom and Reenen (2002) determined that the influence that innovation brings on the firm performance has all the earmarks of being contemporaneous when performance is estimated by market value; however, when performance is predicted with productivity, there is slack. Bessler and Bittelmeyer (2008) reported that the effect of innovation development is favourable in the short run hence not permanent and, in the long run, their impacts. This finding is in line with the Schumpeterian thesis of innovative eradication. Innovations provide a competitive edge in a constricted period, after which learning is diffused over the market. As new products enter the market, the advantages and control of a firm decrease and it will suffer loss eventually and inevitably will be compelled to leave the market except if it builds up a better product.

The banking industry worldwide has improved with time. This improvement has been felt widely through the changes in delivering financial services to customers.

Daniel, Joseph, and Thomas (2014) argued that although the functions that were adopted in traditional banking are still being used in the modern banking industry, there has been a tremendous change in structure over the years. The alternative Channels for financial services delivery have increased significantly in number. It has also been noted that new ones have overshadowed the initial delivery processes. They include e-banking (e.g., automated Teller Machines (ATMs), mobile banking and Internet banking products) (Daniel et al., 2014).

Sweeny and Morrison (2004) suggested that innovations in the banking sector have transformed banking in retail, especially in delivering financial services. Through working hand in hand with telecommunication industries as well as software and hardware companies and technologies, the banking sector has been coming up with ways for customers to access services such as checking account balances, paying bills, transferring funds, and buying services and goods with ease as cash, cheques or physical movement into a bank are not being required.

Francesca and Claeys (2010) sought to identify key decision determinants in banking groups concerning the offer of online administrations and services. In light with a board of the 60 biggest EU banking groups over the period between 1995 and 2005, the examination results propose that banks with a substantial cost structure, an expansive share of the overall industry in customer deposits, and high non-interest activities are bound to present financial Innovations. There is little proof of economies of the extent of data and correspondence advancements. The bank group's performance with internet banking is poor. The underlying interest in innovation has demonstrated higher than any ensuing cost-saving, particularly on work. The investigation presumed that Internet banks fail to make cooperative energies with other activities in the banking sector; thus, financial innovations in internet banking does not enhance banks' financial execution.

An investigation was conducted by Vargas (2008), surveying the contribution innovations to the creation of financial intermediations services in Costa Rica. The main objective of the research was to measure the commitment of item developments to the yield of intermediation services of the State-claimed banks of Costa Rica, as estimated by the user-cost approach. The mediators incorporated into the study were the three banks that comprise the sector of State-possessed commercial banks of Costa Rica. The purpose behind concentrating on the three Banks was that the three banks account for 50.7% of the yield of financial intermediation services all banks, as indicated by evaluations for 2006. By estimating the impact of item innovation on their yield, it would be possible to survey the impact on the total yield of all banks. The primary outcome was that the weight of yield got from item innovations on complete credited output was moderately low, although it was developing. Output originating from the 11 product innovations reported attributed to just 2.4% of all yield in 2005, 3.1% in 2006, and 7.3% in 2007. The majority of the services of intermediation of the three banks were given through traditional financial items and that the commitment of innovation to that provision is marginal. The investigation ought to have incorporated a little extent of the privately-owned financial intermediaries to give a reasonable pointer of the effect of innovation on the building of implicit service (Vargas, 2008).

Fan (2011) found that the GDP growth in India and China during the period 1981 till 2004(in the 1990s) can be explained by innovation capacity. To strengthen their innovation capacity, they invest in R&D and personnel, patents, and high tech/service exports. Hence, by linking the science sector with the business sector, establishing incentives for innovative activities, and balancing the import of technology and indigenous R&D effort, both countries experienced greater economic growth in previous years. In line with this, Helpman (2004) asserted that innovation increases income per capita and stimulates steady economic growth. Hence, innovation is mentioned as a major economic growth driver. Innovation is also one of the main goals for governments to stimulate economic growth. Innovation is also needed to create jobs because the most developed European countries are losing their competitive power to China and India.

As indicated by Juan (2009), the majority of studies on the effect of innovations on firm performance has been generally conducted through bookkeeping measures, which depend on the figures that show up in the organization's balance sheet and income statement. Even though these measures give a historical record on the past and present of the firm, they can be deficient because: i) they do not include future benefits expectations of the investors; ii) could prompt disarray because of the insufficiencies inherent in their reliance on various conventions (e.g., rate of deterioration), which make difficulty in comparisons; iii) do not mirror all the opportunity costs upheld by the firm; and iv) they do not permit the change of contrasts in performance of differences in the hazard bolstered by the organizations.

According to the Financial Brand (2016), in the past and for many years, the rate of growth for mobile banking and mobile payments had been described as slow. The need for digital convenience has drifted the reason for use both mobile banking and mobile payments from ownership of new technology. During the past numerous years, the reason for not adopting mobile banking innovations has not changed significantly, although the banking industry has not addressed all customer needs. Therefore, although other industries like retail, hospitality have changed numerous of their clients to a digital solution, the banking industry has experienced a big change in market share and capitalization.

Millions of prospective customers have been offered access to mobile banking, which has provided solutions in the markets. These markets have been exposed and gained entry to mobile phones, although, in the financial mainstream, they have remained excluded. Basic financial services are made easier due to the reason that time and distance to the bank are reduced significantly. Bank's transaction costs and other costs are also minimized (CGAP, 2006). According to Lee, Lee and Kim (2007), a favourable moment and occasion for financial institutions to expand banking services to new clients, therefore, enlarging their market share is provided by mobile banking innovations.

1.1.2 Regional Perspective

Nwokah, Ugoji, and Ofoegbu (2009) investigated to find out the impact of product advancement through innovations and organizational execution in the Nigerian brewing industry. Data was assembled from 32 authorities drawn from showcasing, research and development and production divisions in four breweries in the south-south and south-east regions of Nigeria utilizing questionnaires. The information was analyzed using the Spearman rank correlation coefficient, which was found to be an appropriate statistical test. The discoveries uncovered in addition to other things that item/product advancement features of item quality and product lines/item blend were significantly and positively related to the corporate performance aspects of profitability, sales volume and customer dependability. The study presumed that a positive and noteworthy relationship exists between item quality product offerings/item blend and gainfulness or profitability, sales volume and customer dependability.

1.1.3 Local Perspective

The Kenyan financial sector has experienced huge changes over the last two decades. A ton of changes has been attempted in the sector that has prompted multiplication of financial products/items, activities and organizational structures that have enhanced and expanded the proficiency of the financial framework. All these improvements, combined with changes in the global financial sector and the expanding mix of domestic and worldwide financial markets, have prompted quick financial

development. The increasing importance of the financial industry in present-day economies, caused by the quick rate of advancement in this sector, has led to the need to study financial innovation (CBK, 2013).

Overall, there has been colossal strategic innovation moves banking sector in Kenya with: niche banks offering more alternatives to customers, the number of banks increased to 43, 75% of the Kenyan populace being served by different financial sector characteristics, over 77% of Kenyans inside 5kms of an administration point, an expansion of Agency Banking with more than 35000 operators countrywide and a touchy development of mobile money (CBK, 2016).

Korir (2014) did a study to determine the effect of financial innovation on the performance of Kenyan commercial banks. The population target included all the 44 commercial banks in Kenya. Regression and correlation analysis was used to establish the correlation between variables of financial innovations and the performance of the Banks. The findings of his study revealed that financial innovations variables have a strong and significant positive effect on Bank performance. The EFT value of transactions, checks cleared value, the value of EFTs cleared the value of RTGS transfer explained 92.8% of the variability in the performance of the banks in Kenya. The study concluded that firm performance is significantly and positively affected by financial innovation.

According to Cytonn Investments (2015), with the growth of mobile and agency banking, penetration in the market has increased and this will lead to a greater number of transactions as well as offer loan products to the mass market. Songoro et al. (2015) conducted a study on the effect of financial innovation on the performance of Savings and Credit Co-operative Societies in Kenya. The study concluded that financial innovation does not explain a 100% change in SACCO's financial performance. The study examined the effect of Process innovations specifically, Automation, Computerization and ATMs on Dividends per share and profitability.

Kimingi (2010) researched to explore the effect of technological advancements and financial innovations on the performance of Kenyan banks. The researcher believed that innovative advancements result in the improvement in financial performance

banks in Kenya through expanded bank sales, benefits increment and return on equity. Korir (2014) tried to find out the link between financial innovation and performance of Kenyan commercial banks. He reasoned that financial innovations influenced financial performance positively. Varis and Littunen (2010), like many other scholars who did studies on the link between financial innovation and market value, found that improvement in firm performance measures like market value is the only paramount reason why firms engage in innovations.

In another investigation to determine the correlation between financial innovation and performance of banks in Kenya, Githikwa (2009) tried to analyze the selection of a product, process and institutional advancements in the Kenyan business bank in 5 years from 2005 - 2010. The study findings were that banks that have improved financial performance had adopted financial innovations. Further, the findings of the study revealed that the adoption of innovations makes banks increase assets and decrease expenses on activities/operations, lessen cost per transaction and similarly empower banks to fulfill the needs of their clients. Executing item/product, process and institutional advancement make the business banks end up progressively adaptable to their tasks and it prompts securing of the qualified workforce in the bank, quality items/products and permits bank expansion.

Another investigation was led in the Kenyan setting by Mwangi (2013). The study area was on the effect of bank innovations on the financial performance of the Kenyan financial business. The discoveries uncovered that financial innovations have a measurably huge impact on profit, return on assets, benefit and client deposits of business Kenyan banks. The tests of significance demonstrated that financial innovations have a significant positive effect on performance. Further, the findings revealed that mobile phones have a higher moderating effect on Bank advancements than internet services while affecting performance in the banking industry in Kenya. In light of the above discoveries, the researcher presumed that financial innovations affect the performance of Kenyan banks positively.

Tunay (2015) conducted a study on the relationship between financial innovations and the performance of banks in Kenya. Specifically, he majored in the effect of

electronic-based banking services on bank's profitability performance. The results of his study demonstrated that a few factors were found to be different from the normal and expected negative relationship, on account of the assorted variety in the dimension of the advancement of nations, socio-cultural structure and electronic banking infrastructure. The number of POS terminals and the number of clients utilizing internet banking service was resolved to impact gainfulness contrarily. This appears to negate most of the studies in these areas laid out beneath. Then again, the number of issued bank cards (Visas, credit cards, *et al*.) and the proportion branch numbers to the ATM numbers had a positive and significant effect on bank performance. ATMs percentage to the number of branches affect gainfulness/profitability most astounding from the other factors. Nearly in each nation, clients were most acquainted with electronic banking applications as ATMs, which decrease operational expenses in branch office-based.

1.1.4 Kenya Banking Financial Innovations

According to Chipeta et al. (2018), financial innovation has become very central in the last decade in Kenya as banks have switched from branch-based traditional banking to branchless banking. Consequently, this move has attracted interest in global finance research. Kenyan banks have diversified their operations by use of modern financial innovations. These innovations include agency banking, mobile banking, debit and credit card innovations, internet banking, Real-time gross settlement (RTGS), Point of sale (POS) terminal and Electronic funds transfer (EFT).

As indicated by Ngari and Muiruri (2014), the world banking and financial framework are in the anguish of a change caused by expanding globalization and deregulation. Financial developments, for example, those accessible in mobile money, ATMs, credit cards, debit cards, Internet banking agency banking and smartcard applications, are occurring at an overwhelmingly quick pace in the worldwide banking industry. Banking can be followed back to the year 1694 with the foundation of the bank of England. The bank was begun by a couple of people who were cash moneylenders with a point of loaning cash with interest. The financial innovations advancement in the banking industry in Kenya has not just led to an

expansion in the number of banks, but also additional improvement in the dimension of refinement with new instalment frameworks and resource options in contrast to holding cash. Related with this quick extension in the banking sector is a scope of financial developments which include ATMs, debit cards, electronic cash, agent banking, value capping, internet banking, T+1 check clearing system (CBK, 2013). Different advancements in banking are RTGS, EFT, ACH, MICR, Retail Banking, free advisory services, usage of standing guidelines of clients, instalments of service charges, finance exchanges, internet banking, phone saving money, versatile managing an account, moving protection items, issue of free checkbooks, explorer' s checks and a lot more esteem included services some kinds of finance development are driven by enhancements in PC and media transmission innovation (CBK, 2013).

As indicated by CBK (2013), Kenya has seen expanded challenge and decent variety in the cell phone financial administration space with progressively cell phone administrators propelling versatile cash items. Money related organizations have likewise progressively cooperated and incorporated their working stages with those of cell phone monetary administrations stage to use on the comfort and efficiencies they present. Subsequently, the unit costs for a portion of the financial products have been brought down mostly. The capability of mobile phone innovation to connect the financial access boundaries of separation and cost appears un-rivalled in Africa. In acknowledgement to this, AFI federal policymakers and controllers/regulators from 18 African nations that are AFI members to dispatch AMPI in February 2013. The point of AMPI is to share encounters and create approach answers for stretching out financial consideration to the Continent's substantial unbanked people using Mobile telephone financial related services. CBK's job in driving financial incorporation through cell phone financial services even before the authorization of the Act of Payment Systems, the Central Bank of Kenya played a proactive role in encouraging interviews on recommendations by the media transmission organizations like Safaricom and Airtel to present mobile phone cash transaction services.

Banks have grasped combination with mobile application stages and internet banking, and this has prompted heaps of effectiveness in conveyance, prompting expanded take-up of banking services, especially in the mass market. Appropriation

of Agency Banking the agency banking model has a decrease in the working costs and enhance productivity and will be a crucial driver for expansion. This likewise guarantees a lot more extensive reach. Development of the retail fragment and the white-collar class: As the centre - class develops quickly in Kenya, quicker than dominant part of the nations in the area, there is an intrinsic increment in utilization, consumption and increase in population size which will require banking services. Development both regionally and locally: With expanded monetary incorporation in Kenya at 75%, banks hoping to extend in the less infiltrated markets of Tanzania, Uganda, Rwanda, South Sudan and DR Congo are opening new Channels of income in nations with moderately appealing spreads contrasted with Kenya. CBK has tightened its controls on banks with an accentuation on straightforwardness on loaning rates, administration and capitalization. Banks are relied upon to stay stable and position themselves for stable development (Cytonn Investments, 2016).

In an effective securities exchange, share costs mirror all the accessible data on an organization. Honestly, any data got by the market (for example, on innovation activities) will is quickly joined into the offer cost. In like manner, any change to an organization's share price will reflect, without predisposition, modifications to its future cash flows. In this way, the presentation of new information on innovation permits an examination of share price conduct to unequivocally break down the fundamental change to impartial market forecasts on future market value is a forward-looking firm performance that conquers every one of the troubles of the customarily utilized in reverse looking firm gainfulness, (for example, bookkeeping measures) (Juan, 2009). Declarations about the commencement of an innovation venture can result into a positive return since it could make new market developments, discourage contender passage, enhance the likelihood of achievement, and upgrade firms' focused position (Arnand & Khanna, 2000).

1.2 Statement of the Problem

Financial innovations in the Kenyan banking industry has become the central focus in the last decade and a critical pillar that has been upheld by CBK. Despite the numerous financial innovations that Kenyan banks have adopted, a portion of them

has kept on encountering a decline in market value, causing them to merge with others (Bank supervision report, 2015). Innovation is broadly viewed as a standout and an added advantage since it prompts product and process improvements. It also makes continuous advances that cause firms to endure, enables firms to develop more rapidly, be progressively productive, and at last, be more gainful than non-investors (Murat et al., 2013). Walder et al. (2011) indicated that innovation permits companies to achieve improvement in market share, quality and costs that leads to improvement in profitability and company growth.

Innovation is a standout amongst the essential factors in the development of new items and one of the fundamental drivers for economic growth (Peilei, 2011). Despite enormous achievement in Kenya's Banking sector advancements over the most recent 10 years, an investigation of the monetary condition shows that the overall economic development acknowledged throughout the most recent 10 years' extents between 3-6% which is to a great extent underneath the Government target scope of 6-8% (Marambii, 2017). In addition, the sector has seen 3 banks crumple which came about due to low buyer trust in the area and generally the strength of the sector. This crumbled further after introduction of capping in the interest rate in August 2016, which was relied upon to bring down interest margins and result in slower credit development. Non-performing credits have similarly expanded over the part from an industry average of 5.2% before 2015 to an average of 7.9% as at September 2016, predominantly ascribed to a challenging business environment and upgraded supervision by the Central Bank. In this way, the banking sector valuations have mostly gone down, with industry P/B declining from 1.9 % at the end of 2014 to 0.8 % at the end of January 2017 (CBK, 2017).

Market capitalization of a company can be perceived as an achievement in the management of a firm. It also reflects the market response to a company. According to stakeholder’s theory, the shareholder’s wealth is depicted by the increase in market value which is measured by the company’s share price. The firm value, therefore, depicts the market value of a company. Consequently, improvement in the firm’s value will lead to an increase in the market value of a stock and vice versa. The more the firm’s value the higher the company’s shares demand and vice versa.

Several things related to the firm's value is yet to be agreed by the financial Scholars (Hendri, 2010).

Past studies revealed mixed results on the correlation between financial innovations and market capitalization measured by market value. For instance, empirical studies by Chuang et al. (2015), Gunday et al. (2011), Khansa et al. (2009), Cho et al. (2005), Meng et al. (2015) revealed a positive and significant effect of financial innovations on the market value of service industry like Hotels. Contrary, some other researchers on the same area of the study found a significant negative link between financial innovations and market capitalization of service firms, for example, Nicolau et al. (2013), Zach et al. (2015), Dotzel et al. (2013), Filson et al. (2002), Ho et al. (2005).

Bonn (2000) argued that most of the studies in this area concentrated on the effect of a few innovations on firm performance in the developing counties and their outcome has been empirically inconclusive and produced mixed results. Further, most of the studies on the effect of innovation on firm performance has generally been done through accounting measures, that depend on figures in the balance sheet of companies. For instance, Scholars et al. (2009) and Francesca et al. (2010) in their studies all concluded that innovations had the least impact on firm performance, while others such as Batiz-Lazo and Woldesenbet (2006) as well as Mwania and Muganda (2011) concluded that innovations had a significant contribution to firm performance. In a related study by Songoro (2015), the results revealed that financial innovations variables do not explain for 100% deviation in performance. Mogaka (2011) asserted that the usage of ATMs, credit cards, mobile banking have a significant statistical positive effect on the performance of banks in Kenya. In contrast, agency banking financial innovation hurts the performance of commercial banks in Kenya. Ngumi (2013) concluded that mobile phones have more effect on bank performance compared to internet services. Korir (2013) found that innovation has become essential to provide new products and strategies to suit different circumstances of time and market better and to meet different requirements of participants in the financial system.

From the above conceptual, empirical and theoretical perspective of literature review, it is crystal clear that there are mixed conclusions and a research gap exist on the link between financial innovations and market capitalization in the banking industry of developing countries like Kenya. The study utilized stock market-based measure, to account for the shortfalls noted in the above literature review, called market capitalization. Market capitalization is a paramount measure of returns to innovation as pointed out by Bronwyn (2010). Moreover, most empirical articles on financial innovations and performance focused on a few financial innovations' variables, for example, agency banking financial innovations, Plastic credit card innovation's, were left out in most of the studies reviewed therefore not comprehensive.

1.3 Objectives of the Study

This section outlines the objectives which the study addressed.

1.3.1 General Objective

The main objective of this study was to establish the effects of financial innovation on the market capitalization of listed commercial banks in Kenya.

1.3.2 Specific Objectives

The study pursued below specific objectives;

i. To determine the effect of agency banking on market capitalization of listed commercial banks in Kenya.
ii. To establish the effect of mobile banking innovation on the market capitalization of listed commercial banks in Kenya.
iii. To establish the effect of plastic credit card innovation on the market capitalization of listed commercial banks in Kenya.
iv. To determine the effect of internet banking innovation on the market capitalization of listed commercial banks in Kenya.

v. To evaluate the moderating effect of banks ownership on the relationship between financial innovations and market capitalization of listed commercial banks in Kenya.

1.4 Research Hypotheses

A hypothesis is a logical conjectured relationship between two or more variables expressed in the form of testable statements. This study sought to address below pertinent research hypotheses;

H_{01}: Agency banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

H_{02}: Mobile banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

H_{03}: Plastic credit card innovations have no significant effect on the market capitalization of listed commercial banks in Kenya.

H_{04}: Internet banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

H_{05}: Bank ownership has no moderating effect on the relationship between financial innovations and market capitalization of listed commercial banks in Kenya.

1.5 Significance of the Study

Below stakeholders will benefit from this research:

1.5.1 Regulator-CBK

This study will be of significant benefit to the regulator CBK in making monetary policies through seeking to enhance technology to see the growth in financial services through the enhancement of access to the services.

1.5.2 Government

The study will give insight to the Kenyan Government in that it will be able to identify areas in technology and innovations to waiver taxes and other non-monetary incentives towards promoting the financial sector. Besides, it will be of extraordinary essentialness to the Government administration, policymakers and industry players. The investigation discoveries will be a point of reference for the administration policymakers in figuring robust, comprehensive and adjusted approaches that establish the framework for advancement and innovation. Communications Commission of Kenya (CCK) will likewise profit a lot as the discoveries of this investigation will improve the assistance of the advancement of internet business. The strategies will improve the worldwide aggressiveness of the nation, versatile economy and accomplishment of fundamental national objectives and vision 2030. To the business players, strategies planned will upgrade stability, development and execution in the banking sector.

1.5.3 Commercial Banks

Through the findings of this study, banks in Kenya, just as the different firms in the financial services sector, will profit gigantically from the discoveries in this research. The administration of listed business banks in Kenya will profit through discoveries as they will enable them to upgrade budgetary advancements that would prompt supported profitability and better execution. The investigation findings will enable banks in assessing the significance of financial innovations on their market capitalization regarding reinforcing benefit. Banks, particularly commercial ones, are quickly ending up increasingly mindful of the significance of money related development in this period and this examination includes the impulse to information the connection between advancement and execution. Business banks in Africa will gain from this Kenya ponder and comprehend the advancements that they can duplicate in their organizations to enhance their execution. The examination discoveries will advise them on which financial innovations have a superior connect to market capitalization and henceforth save money on the expenses of conducting cost-benefit research in their institutions.

1.5.4 Shareholders

The primary beneficiaries of financial innovations research will be the shareholders, so this study will be of great use to the investors/owners of the banks in making decisions on whether or not to invest more in the share of the listed banks.

1.5.5 Academicians and Researchers

The study will be of great importance to researchers in this area as the challenges encountered in the study may lead to the creation of a knowledge gap that needs to be researched on, adding and improving the literature on financial innovations in the banking industry. Future researchers and academic institutions will use the findings of this research as a source for future reference.

The Modigliani theoretical preposition, Efficient Market Hypothesis and Random Walk theories of market prices concur that prices of the securities in a stock market are difficult to be predicted; however, these findings have a direct conflict with technical analysis which postulates that the future price of a security can be predicted and forecasted based on the information and it is not possible to predict market because prices of stock reflect all information available. Other theories of financial innovation have reported that there exists a link between financial innovation and market value, for instance, Silber's theory, Merton Market efficiency theory, Schumpeter theory, and Transaction cost theory.

1.6 Scope of the Study

The study covered 11 listed Kenyan Commercial Banks as licensed by the Central Bank of Kenya for the period between January 2013 and December 2017. The financial innovation that was used in this research was limited to Agency Banking, Mobile banking, Plastic Credit card, Internet Banking and their effect on Market Capitalization of 11 Listed commercial banks in NSE. The reason for choosing listed banks was because of the easy availability of data on the market at NSE reports and, therefore, the ease in determining the correlation between financial innovation and market capitalization. The study, therefore, utilized secondary data.

1.7 Limitations of the Study

This study only concentrated on financial innovations in listed commercial banks and left out the non-listed banks. The study also excluded other financial innovations from non- banking industry like insurance, Savings and Credit Cooperatives (SACCO's) and manufacturing due to resource and time constraints. Furthermore, it only concentrated on market capitalization as a measure of firm performance as this can only be obtained from listed companies. Nevertheless, this forms a favourable opportunity and platform for further investigation in the field of financial innovations and market capitalization.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The focal point for this section concentrates on three main parts. Part one covers the critical theoretical review of financial innovation and the conceptual framework that guided this study. The second part focuses on a review of existing literature in line with study variables. Section three deals with empirical studies carried out in the past and per the variables presented in the research model, critique, summary and research gaps on financial innovation and Market Capitalization.

2.2 Theoretical Literature Review

Kombo and Tromp (2009) define theory as a declaration or a class of reasoned statements, anchored on the available body of facts or information that explains some a fact or a situation. An individual doing research must, therefore, have adequate knowledge of the theories relevant to the area of research. Therefore, the theoretical literature review assists the researcher to view the variables of a study. It also aids in providing a general structure for data analysis; and finally, it facilitates in choosing carefully applicable research design.

This part examines suppositions that validate the link between financial innovation and Market Capitalization. The theories include Modigliani and Miller's Theorem, Markowitz Theorem, Schumpeter Theory of Innovation, Silber's Theory of Constrained- Induced Financial Innovation, Merton's Market Efficiency Theory of Innovation, Transaction Cost Innovation Theory and Efficient Market Hypothesis as discussed as below;

2.2.1 Modigliani and Miller's Theorem

According to Pagano (2005), University professors and Nobel Prize winners Franco Modigliani and Merton Miller in 1958 developed the first and one of the most paramount theories called Modigliani and Miller's Theorem. This theorem

demonstrated the insignificance of financial decisions in a capital market that has perfect conditions.

Modigliani and Miller (1958) stated that the power of earning and asset risk is used to compute a company's market value. The fundamental assumptions of Modigliani and Miller's Theory (1958) were that the market is completely efficient with no taxes, bankruptcy and transaction costs. This was not realistic and hence tax effects were added in the model in1963 by Modigliani and Miller to make the theorem to be more realistic.

According to Breuer and Gurtler (2008), Modigliani and Miller's papers of (1958, 1961 and 1963) put forward three paramount postulations that formed the base of this theorem. The first proposition was that the total market value of a firm is not dependent on the company's capital structure. The second proposition was that the cost of equity would increase with the increase in debt-equity ratio and the last preposition that they put forward was that the capital structure is irrelevant in the market value of a firm.

Proposition I of Modigliani and Miller capital structure irrelevancy theory (M&M, 1958) becomes the economic base that drives financial innovation that postulated that the capital structure of a firm is not dependent of the market value. Specifically, proposition postulated the value of a firm is not affected by cash flow, governance and rights allocation. Strict assumptions regarding imperfections in the market govern this restriction which includes information asymmetries, adverse selection and the problems of Agency relationship (Myers & Majluf, 1984). Other assumptions of the imperfections include incomplete markets (Tufano, 2003), and taxes and regulations (M&M, 1963). Because of the above observations, demand for financial innovations are generated that lowers costs of operations of the firm and enhance the liquidity of the firm hence increased effectiveness in risk (Tufano, 2003). Conversely, where the central assumptions of the M&M capital structure irrelevancy principle hold true, the proposition I predict that we should observe no demand whatsoever for innovation (at least in terms of the design of new financial instruments).

M&M Proposition I highlighted that the firm value is based on its ability to generate profit and the underlying asset risks. Modigliani and Miller made consideration and discussed two firms with different capital structures. They concluded that financial decisions, such as financial innovations that companies take into consideration, do not have any implication on the firm's market value (Brigham & Ehrhardt, 2010).

In substance, M&M theorizes that expected cash flow is divided proportionally between company investors in compliance with the capital structure, whereas the company's value remains unaffected by this share-out (Popescu & Sorin, 2011). According to Modigliani and Miller (1958), the risk and profitability of an asset determine the company' value and not the company's capital structure.

According to M&M theory, the equation derived is denoted as;

$$\boldsymbol{V_L}=\boldsymbol{V_U}$$

Where: $\boldsymbol{V_L}$ is the unlevered firm value in the capital structure, and $\boldsymbol{V_U}$ is the levered firm value in the capital structure. Modigliani and Miller (1958) contended that through this equation, financial decisions do not have an implication to the company's market value. To be able to attract customers to financial markets, financial innovation is necessary. When new products and new chrematistics of operating financial products are developed, this is referred to as financial innovation. Therefore, the financial products created should reduce financial risk and aim at financial optimization. Modern Globalization drives financial and exposes a company to new and more significant international risk. Financial innovations are part of investment decisions that the mangers would decide to finance from the capital structure that would determine the market value of the firm. Capital structure is a term that is used to refer to the composition of equity and debt, which are vital sources of long-term financing. The process through which financial securities and pricing derivatives which provides payoffs to shareholders and investors are created is another definition of financial innovation (Sekhar, 2013).

The M&M theory seems to be unclear to date and faces numerous objections firm finance scholars despite the effort and time spent in coming up with the theory.

Modigliani and Miller made a significant contribution to financial theory in their article entitled the cost of capital. Modigliani and Miller's three propositions enabled firms to focus ahead of the structure of capital and determine the factors that add value to a company. From M&M Theorem, it can be concluded that financial decisions undertaken by companies such as financial innovations are not relevant to a firm's value. The assumptions of the absence of taxes, perfect market, absence of transaction costs or bankruptcy costs showed that this theory assumed a controlled environment which is not realistic. It is of no wonder that the postulates were created in an unrealistic world. Consequently, the M&M theory is not valid without the assumptions that are strong and market imperfections.

2.2.2 Markowitz Theorem

The mean-variance portfolio selection theory was developed by Markowitz (1959). This theory suggested that for a maximum return, investors should broaden their portfolios fully by having a mixture of a risk-free and market investment. Financial innovations are a big investment decision that an investor should consider. To increase the market value and return of portfolios, investors that adopt varying risk/return goals can use leverage strategy. This theory, therefore, illustrated on how investors should use financial innovations as a significant investment decision to increase the market value and return of a firm.

Markowitz (1959) argued that investors who have varying return and risk goals such as financial innovations could adopt leverage to increase the ration of risk-free return to the market value in their returns. His theory was based on the capital market line (CML) equation as illustrated below;

$$RP = IRF + (RM - IRF)\ \sigma P/\sigma M$$

Where,

RP = Expected Return of Portfolio

RM = Return on the Market Portfolio

IRF = Risk-Free rate of interest

σM = Market portfolio Standard deviation

σP = Standard Deviation of portfolio

2.2.3 Schumpeter Theory of Innovation

This theory of innovation postulates that in business, innovation is the main reason for improved investments and firm performance. According to Schumpeter, innovation in firms causes cyclical business processes. He defined innovation as the changes in production methods, new product, new. He argued out that innovation is not the same as invention, but it is the application of new technology, new processes and methods in a commercial entity. Schumpeter used the work of preceding economists like Arthur Spiethoff to build on his study of Business cycles that explained the link between innovations and firm performance. In his study, he examined the four stages of economic cycles, namely; recession, welfare, booming and depression amid innovations. In his analysis, he pointed out innovations were very crucial in that they affect the economic development and eventually firm performance and that fluctuations that were long term could cause firms to innovate.

Schumpeter identified innovation as a paramount decision for change of the economy. He put forward that change in the economy is driven by innovation market power and entrepreneurial activities. He reasoned that market power that resulted from innovations provides more significant results than price competition market power. Moreover, he argued out that abnormal profits can be created by technological innovation that would easily create monopolies that are temporal, imitators and rival firms would erode that. The temporary monopolies enable firms to come up with new processes and products hence innovations.

According to Sharma and Lacey (2004), the positive correlation between financial innovation and performance measures like market capitalization or market value can arguably be explained traditionally. This is because of the direct competition of new products when introduced to the market, therefore, making companies enjoy the

relatively high market value and profits. With time, because of competition and emulation, the profits and consequently, the firm value is likely to decline. However, the market value and profits of companies that have adopted financial innovations will continue to increase.

2.2.4 Silber's Theory of Constrained- Induced Financial Innovation

This theory of financial innovation was advanced by Silber (1983). He attributed the reason for financial innovations to maximize profits and the market value of firms. This theory puts forward profit and value maximization as the primary reason why firms adopt financial innovations. According to Silber, some restrictions exist, for instance, internal and external handicaps that would hinder a firm engaging in financial innovations. According to Silber (1977), financial firms doing constrained optimization through financial innovation enables companies to maximize firms' value. Furthermore, from research, it is evident that firms that do not innovate are likely to have lesser performance whereas, organizations that are involved in innovations, the value as well as profits are likely to be high.

Silber (1975) discussed the theory of financial innovation based on some constraints that exist in a firm. He cited that weakest companies would be more innovative ones and such companies are likely to face the highest constraints. Silber (1983), these limitations and constraints ensure that the management is stable and lower the effectiveness and efficiency of financial institutions. This argument was, however, not tested from an empirical point of view. Contrary, According to Tufano (1989), banks that had adopted financial innovations were found to be the most significant and most durable and reliable as well.

This theory examines the link between financial innovations and market value in a microeconomics perspective, and it cannot, therefore, provide an explicit and comprehensive explanation in liberal finance.

2.2.5 Merton Market Efficiency Theory of Innovation

This theory illustrates the link between financial innovations and the market value of a firm. Through this theory, market efficiency theory of financial innovation, Merton (1990) postulated that financial innovations role was to improve to firm's performance and market value. According to Merton, the main drivers that motivate financial innovations is efficiency and social welfare improvement.

Rene (2000) reasoned that financial economists regarded the movement of funds as an advantage of an opportunity for investment and improvement in the efficiency of markets, increase in growth of firms and risk sharing as caused by the positive forces of financial innovations. Contrary to this, many other scholars argued that financial innovations and flow of capital in a firm lead to instability, crashes and other disasters. According to Merton (1990), there are three major motivations for financial innovations which include liquidity improvement, new financial structures creation and economic efficiency that allows for risk pooling, hedging, risk sharing and reduction of agency costs and costs improvement.

2.2.6 Transaction Cost Innovation Theory

The theory was put forward by Niehans (2006). He argued that a decline in transaction costs is the governing principle of financial innovation, a decline in costs results in an increment in the market value of a firm. Furthermore, financial innovation results in technology improvement leading to transaction cost reduction. Financial innovation can be accelerated by transaction costs reduction and financial service improvement. He further contended that transaction costs are reduced by financial innovation hence increase in a firm's financial performance. This theory is relevant for this study because it demonstrates that there is a link between innovations and the market value of firms.

Further, the use of financial innovations such as mobile banking and electronic banking financial innovation variables can substantially reduce a firm's transaction costs hence improving the firm performance measure like market capitalization. Furthermore, the use of IT-related innovations provides efficient management and

coordination of the firm hence reducing the company's costs of transactions. Reduction of costs of operations can be as a result of financial innovations such as agency, internet and mobile banking and consequently, these influences capitalization for the bank.

Hicks and Niehans (1983) proposed this theory when they studied innovation. Reduction of transaction costs is what they considered as the underlying principle of financial innovation feedback which was a result of technology improvement. The decline in transaction cost can cause financial innovations and financial services adoption. Microscopic economic structure change was the perspective under which financial innovation was studied. Reduction of the costs of transactions was the main motive behind financial innovation. Another perspective of explaining this theory was the financial innovation underlying motive which reasoned that the reason for financial innovations was for the firm to earn profits and benefits.

2.2.7 Efficient Market Hypothesis

EMH states that the price of securities such as securities factors all information that is known about those securities. This means that if this is true, then no single investor has an advantage over the other. EMH states that every single investor will behave randomly and will not require investors to be rational; however, investors in the market will always be right. In simple terms, efficient therefore means normal.

EMH is one of the numerous ways of describing the stock market behaviour. This concept describes the stock market using the level of efficiency in giving out information. Fama (1965) put forward this module as a theoretical proposition. He argued out that an efficient market does not exist empirically. Fama (1970; 1971) divided market efficiency into three forms of efficiency, namely; weak, semi-strong, and strong forms.

Weak form EMH defines how well past returns predict future market returns. It suggests that securities have all past information included. The fundamental analysis of securities can offer information to an investor to produce above-market returns. Semi strong EMH suggests how quickly security prices reflect public information

announcements. This form of efficiency implies that neither fundamental nor technical analysis can offer an investor an advantage and that new information is priced into the securities immediately. The strong form of EMH suggests how private information is not fully reflected in market prices for any investor. This implies that no individual investor can advantage over the market because all the information both private and public is priced into stocks.

A stakeholder can measure the performance of a company by looking at the share prices of the company. According to Brown (1994), EMH is paramount in the measurement of performance and reporting statement. Consequently, information disclosure is, therefore, an essential requirement in an efficient market. For instance, if the management wants a correct valuation of company shares by the stock market, sufficient and timely information must be provided. When this information is available, news spread. An efficient market regarding information is the one that the price fully reflects that information Fama, 1970). In a perfect world, an efficient market cannot exist; however, an efficient market becomes a benchmark.

Similar to Modigliani theoretical proposition of the structure of capital, EMH proposition by Fama permitted other theories and finance models to be developed. One of the early studies on the efficient market hypothesis is the Random walk hypothesis. This theory was put forward by Burton Malkiel, a professor of economics. He contended that security prices move randomly; therefore, the name was derived here. He argued that any effort to estimate the future movement of security prices movement is not possible, either through technical or basic analysis. Random walk hypothesis theory of finance states that prices of securities in the stock market emerge in a random walk. It states that stock market prices move randomly.

Consequently, security prices in the stock market are difficult to be predicted. This theory concurs with an efficient market hypothesis. In Finance, the random walk theory of security in a stock market is the confidence that a security's current market price is a product of chance rather than the sum of past events or the result of patterns in human behaviour.

This theory of finance, when applied in the stock market, will suggest that changes in prices of securities vary randomly, therefore difficult to predict. This theory concurs with the efficient market hypothesis that believes that markets are efficient and not possible to predict the market because prices of stock reflect all information available and any new information is random. This theory is in direct conflict with technical analysis which postulates that the future price of a security can be predicted and forecasted based on information that is historical by observing technical indicators and chart patterns. Researchers have not proved whether the security market moves on predictable trends or in a random walk because several studies have been published that agree on both sides. This theory implies to the traders that it is only by chance that a trader can outperform the total average of the market. Investors who support random walk theory propose to buy and hold strategy and selecting and investing in a portfolio of securities equivalent to the overall market and whose price reflects perfectly the movement of the prices of every security in the market.

2.3 Conceptual Framework

Kombo and Tromp (2009) defined the concept as a theoretical or universal plan or scheme or idea speculated and concluded from occurrences. They further defined conceptual framework as a combination of wide believes and proposition obtained from the relevant study area and used to form a successive inquiry. Mugenda and Mugenda (2008) defined conceptual framework is an in-depth explanation of an observable performance in the inquiry which encompasses graphical or visual representation of the main variables under study.

In this study, the financial innovations independent variables were identified and formulated through review of a study by Aysel et al. (2012) entitled analysis the link between financial innovation and performance of Turkish Banking system as outlined in table 2.1 below;

Table 2.1: The Basics of Financial Innovation

Forms of financial innovation	Financial Innovative instruments
New Products	Debentures, Debit and credit cards, Commercial Papers, Derivatives Mutual Funds, Certificate of deposit
New Processes	Mobile banking, Internet banking, ATM & RTGS
New Regulations	Dividend Distribution Tax, retrospective, Taxation
New Markets	Commodities, energy Trading, Carbon Credit, Future market, Forex
New Organizational Forms	Locally owned, Foreign-owned, Islamic banking, a wholly-owned subsidiary, Venture Capital, Pe Funds, one Person Company

Source: Sanjay Banka, Financial Innovation: India's Prowess? Think Tank, CFO Connect, (2013).

The study reviewed the relevant literature around the link between financial innovations and market capitalization and constructed below a conceptual framework:

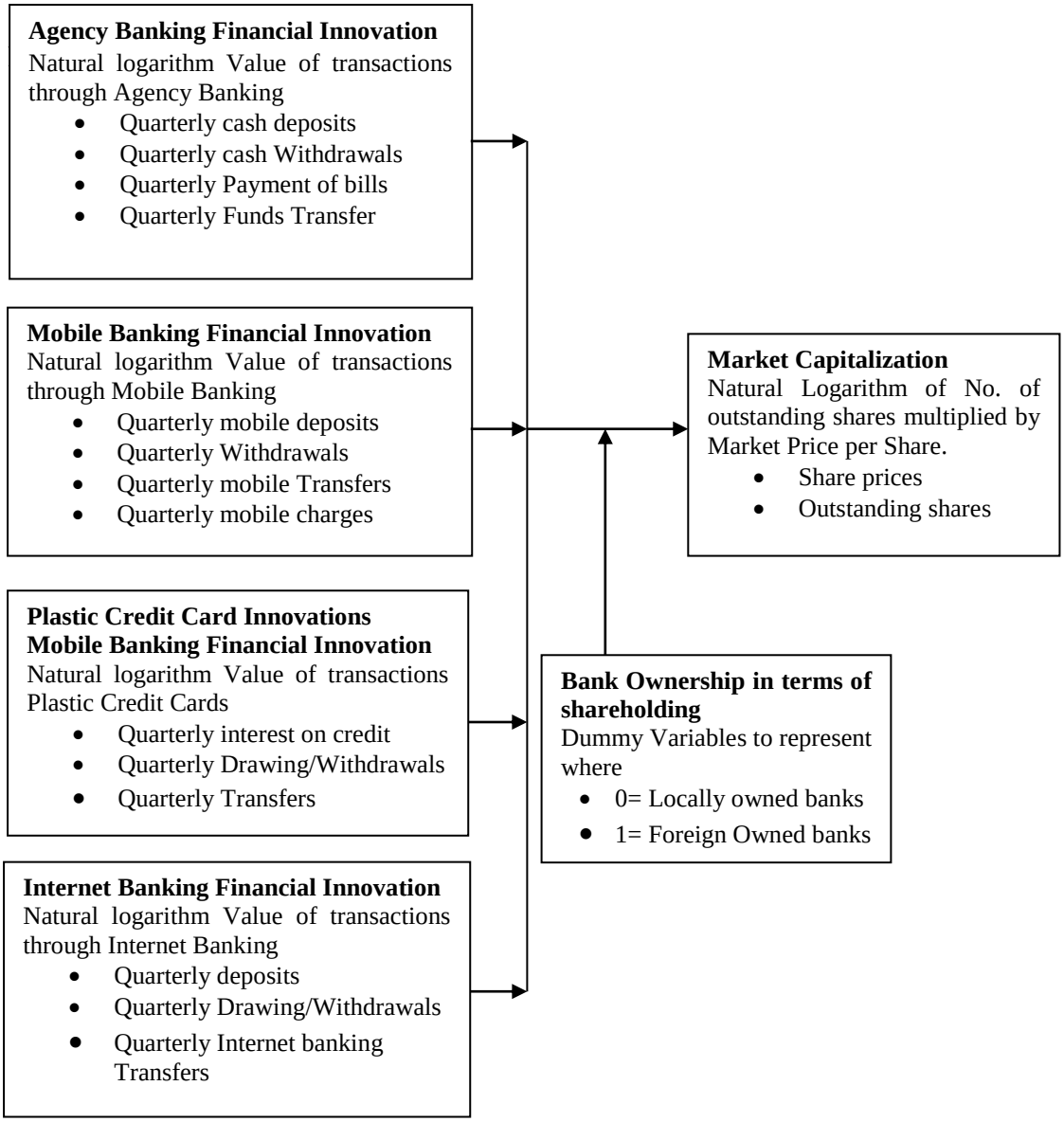

Figure 1.1: Conceptual Framework

2.3.1 Agency Banking

This refers to the process by which financial institutions like commercial banks subcontract a financial outlet to process transactions for the Bank's clients. These transactions that the subcontracted agents or outlets perform ranges from deposits, withdrawals or funds transfer, payment of bills and balance enquiry of bank

accounts. The agency banking model is an innovative way in which commercial banks use to reach the unbanked population. The model uses non-bank entities like shopping arcades, postal services offices, fuel stations, internet cafe's, pharmacist, eateries and retail markets (CGAP, 2006).

According to CBK (2013), the agency banking approach, which was inaugurated in the year 2010, has increased banking services access. The reason for the advocacy towards agency banking adoption was the need to reach the unbanked population who could not be able to access banking services. 29% of the 43 commercial banks in Kenya had embraced agency banking model by 2013 which was still a low adoption rate while some of the banks which have registered for agency banking are yet to roll out the operations (CBK, 2014). In Agency Banking financial innovation, financial institutions adopt several financial innovation technologies to maintain track of transactions. For instance, such technologies would include Personal identification cards (PIN), scanners for scanning bills payment transactions, Point of sale (POS) readers, among others. Extensive capital investment to purchase the technological equipment's and personnel expertise is required for all these technologies which pose significant challenges to outlet retail with insufficient funds (Ivatury, 2006).

In this study, Agency Banking financial innovation was measured as the natural logarithm of the value of transactions through agency banking (LNAB), for each quarter of the year for 5 years from 2013 to 2017. The value of transactions was obtained from CBK quarterly reports and financial statements. This measurement of Agency banking as a financial innovation variable affecting a firm value was similar to one adopted by Chipeta (2018) in his study on Financial innovations and bank performance in Kenya, a shred of evidence from branchless banking models.

2.3.2 Mobile Banking

Kato et al. (2014) defined mobile banking as the use of mobile phones technology to provide banking services. In delivering banking services through embracing mobile technology to conform with the improvement of technology in the banking sector, banks have recently gone through significant technological changes. In delivering

efficiency and accessibility of banking services to customers with the absence of obstacles of the region, location and time, this model of banking has become very helpful.

Mobile banking platform can offer numerous services which include service requests, bank alerts, information inquiries, funds transfers and bill payment. Rapid technological change has resulted in the adoption of mobile banking in banks. As a result of banking industry stiff competition in the recent past, banks have implemented new strategies of sustaining their growth which includes mobile banking innovations that have allowed their clients to do banking services in their mobile devices anywhere and anytime (Tchouassi, 2012).

It is not easy to replicate personal services to be same as for a bank. The most important thing is to embed non-unique service within a unique client service. Banks may be able to provide new services to their clients in a more and target way. With informational and transactional capability in clients' pockets (the mobile-as -Internet -machine), banks may be able to suggest new services to their clients in a much more targeted way. Banks also can manoeuvre the immediacy of the mobile environment fully to extend the advantages of control and choice and hence convenience, across their entire product ranges (the new way to interact view). Costs of service can also decline significantly through mobile banking adoption because of the 'self-service' capabilities caused by the adoption of mobile banking, as well as the non-use of stationery, staff working hours and other physical resources (Mas & Kumar, 2008).

Nearly 20 million individuals are served by more than 60,000 media transmission organizations specialists dealing with over USD 54.4 million worth of Mobile telephone money related service transactions every day in Kenya; subsequently, the monetary framework staying flawless. Customer deposits were the fundamental wellspring of financing for the banking sector representing 71.5 per cent of all-out liabilities. The store base expanded by 10.5 per cent from KSh 2.1 trillion in June 2014 to KSh 2.6 trillion in June 2015, for the most part, credited to branch development, settlements, and organization managing an account. The deposit

accounts expanded by 24.9 per cent from 25.3 million records in June 2014 to 31.6 million in June 2017 (CBK, 2015).

In this study, Mobile Banking financial innovation was measured as the natural logarithm of the value of transactions through Mobile Banking (LNMB), for each quarter of the year for 5 years from 2013 to 2017. The value of transactions was obtained from CBK quarterly reports and financial statements. This measurement of Mobile banking as a financial innovation variable affecting a firm value was like one adopted by Chipeta (2018) in his study Financial innovations and bank performance in Kenya: Evidence from branchless banking models.

2.3.3 Plastic Credit Cards Innovations

CBK (2013) defined a credit card as a mode of payment through electronic data. It is a plastic card innovation which has a magnetic field that makes it possible for clients to make banking transactions. They are suitable and appropriate because customers do not need to carry large sums of cash. Credits cards are offered to Banks customers, which they use during unexpected and urgent circumstances or when a client uses more than he/she has budgeted. Credit cards are used to make purchases and withdrawals money from local ATMs without charges or global ATMs like master cards and VISA.

In Kenya, commercial banks have adopted credit cards as a mean of loan facility enhancement. The overall banking performance in relation to income generation is affected by the acquisition of credit card as an investment by commercial banks in. Profitability improvement has been realized through the adoption of credit cards (Odhiambo et al., 2012). In this study, Plastic Credit Card financial innovation was measured as the natural logarithm of the total value of credit card (LNPCC) obtained for each quarter of the year for 5 years from 2013 to 2017. The value of transactions was obtained from CBK quarterly reports and financial statements. This measurement of the plastic credit card as a financial innovation variable affecting a firm value was similar to one adopted by Chipeta (2018) in his study Financial innovations and bank performance in Kenya: Evidence from branchless banking

models and Kyalo (2012), in his study the effect of credit card usage on the financial performance of commercial Banks in Kenya.

2.3.4 Internet Banking

Atanassov et al. (2007) defined Internet banking as a system that enables customers to do online or internet banking activities. A study by Aysel et al. (2012) on the link between financial innovation and performance of Turkish Banking system identified Internet banking as a form of process financial innovation.

According to Acharya and Kagan (2004), internet banking financial innovation has permitted customers to perform similar banking transactions, for instance, paying of bills, writing of checks, ease of account balances confirmation electronically and printing of statement of customer statements at their comfort. This has been facilitated by the development of transaction technologies that are secured.

In this study, Internet Banking financial innovation was measured as Natural Logarithm of the total number of deposit accounts (LNIB) for each quarter of the year for 5 years from 2013 to 2017. The value of transactions was obtained from CBK quarterly reports and financial statements. Chipeta (2018), in his study on the link between branchless banking models' financial innovations and bank performance in Kenya, adopted a similar method of measuring internet banking as it is used in this study.

2.3.6 Bank Ownership

According to Sanjay Banka, Financial Innovation: India's Prowess? Think-tank, CFO Connect, (2013), bank ownership is a form of organizational financial innovation. Ongore (2011) indicated that the idea of ownership could be illustrated along with two schools of thought: ownership concentration and ownership mix. Ownership concentration is the percentage of shares held (most substantial shareholding) in the company by few shareholders and ownership mix defines the characteristic of the shareholders. In this study, Bank ownership (BO) was used as a moderating variable between the effect of the above forms of financial innovations

and market capitalization of Listed Commercial Banks in Kenya. Bank ownership could either be locally owned or foreign-owned. Dummy Variables were used to represent the ownership where 0=Locally owned and 1=foreign owned.

2.3.7 Market Capitalization

Olson (2005) defined market value as also referred it to as market capitalization is the stock value at a given time multiplied by the outstanding shares. It is the totality of the individual shares that are outstanding and all their respective prices for listed companies in a stock market. Woo (2011) defined Market capitalization as the market value of the stock that it provides an entire company. Based on prospects perception and monetary and economic considerations, market capitalization means the market estimate of a company's value.

Juan (2012) defined market capitalization as the number of offers increased by the offer cost and it is viewed as the best-fair indicator of the estimation of any speculation. In an effective securities exchange, share costs estimate all the accessible information in an organization. Correspondingly, any deviation on an association's share price will be reflected, without inclination and adjustments to its future cash flows. In this manner, the reception of new data on innovation permits an evaluation of offer value conduct to dissect the fundamental acclimation unequivocally to fair market forecasts on returns for an opportunity to come on the referenced development movement.

Market capitalization can be grouped into three categories, according to Olson (2005). The first category is called Large Cap, that ranges between $10 to100 billion. The second category is referred to as Small-cap and the capitalization range between $100 million to1 billion and the last group of market capitalization is known as Micro cap and ranges between $10 -$ 100 million. He noted that the above grouping required to be reviewed over time because of inflation, market valuation and change of population. Based on the changes in market prices of shares, the market capitalization of a company varies daily. It is very critical for the investors and players to make proper investment decisions hence need to monitor the stock market changes. Therefore, the market value remains a paramount area of a formula for

valuation of stock as it can be termed as the value of the entire outstanding shares of a company.

According to stakeholder's theory, the shareholders' wealth is explained by the share price changes, which explain a company's market value. The firm's value, therefore, reflects the market value of a company. Consequently, the higher the firm's value, the higher the value of the stock market and vice versa. The higher the demand for shares of a company, the higher the value of the firm. Several things related to a firm's value is yet to be agreed by the financial Scholars (Hendri, 2010).

In this study, market value or capitalization was studied as a dependent variable on which the effect of various financial innovations on market capitalization, as discussed above, was studied. Market Value for bank i at time t was computed as Natural Logarithm of Number of outstanding shares (LNMCC) multiplied by the Market price per share (Chessar, 2015).

2.4 Empirical Literature Review

In this section of the review of the empirical literature, the researcher reviewed past scholar's literature in the field of inquiry on the relationship between financial innovations and market capitalization or market value of firms. Majority of the studies reviewed indicated a positive correlation between financial innovations and Market value/performance of the firm, though there were still some that negated this conclusion.

Zikmund et al. (2010) defined empirical literature as an administered investigation of published studies, periodicals and books that deliberate theory and provide empirical outcome relevant to the subject being studied.

2.4.1 Innovations and Market Capitalization

Nicolau et al. (2013) carried out a study entitled effect of Innovation on Hotel Market Value. In this study, they examined the potential impact of different financial innovation types, for example, product, process, organizational and marketing innovations on market value. Specifically, they used to experience, growth and

service character innovation variables and how each contributes to market value in the service industry. The proxies that they used for the innovations were Age for experience, growth in turnover over three years for growth variable and service/manufacturing proxy for service character innovation. Their research consolidated empirical evidence of the link between financial innovation and performance of the hotel service industry. They analysed and determined the different levels of an effect that the different types of innovations pose to market value. They used two stages to build the methodology, namely; first abnormal returns were estimated using several sub-steps where abnormal returns on a selected sample of financial innovations were estimated through an event study. Event study was formulated with the idea that an event such as an announcement of innovation will affect a firm's market value. The second step was that they identified the innovation activities that two hotel companies that were listed in the Spanish stock market between 1996 and 2008 and estimated a market model for the two hotel companies. Finally, they measured the unanticipated impact of events on share prices. The findings of this study revealed that innovations were perceived to have a positive significant impact on the company' future sales. There as an increase in stock exchange returns by 1.53% for four days. Marketing innovations and process innovations were found to have a higher positive effect on company's market value as compared to organization and product financial innovations. This is explained by potential Cost differences amongst different financial innovations explained the differences in the effect of market value in terms of innovation types. Experience and growth were found to have a significant and positive effect on market value, whereas service character was found to have a negative and insignificant effect on the market capitalization of hotels.

Zach et al. (2015) did research to identify the link between innovations and market capitalization of Hotels in the US. Their research topic was focused explicitly on the market value because of Tourism Innovation in US Hotels. The study objective was to establish the recent trends in financial innovations in hotels in the US for 3 years between 2011 and 2013. They used cluster and coding approaches to identify the effect of financial innovations on the market value of Hotels. The methodology that they used was; first, they identified the innovations that had been released from the

press in the US operations for two big Hotels in the US.131 announcements were used as the sample of the innovation observations. They further screened all the release of the press to ensure that they were relevant. Only articles that reflected on firm innovations were selected whereas those that did not reflect any innovation as discarded.

Innovation taxonomies as proposed in the Oslo Innovation Manual (OECD, 2005) were used to code the releases that qualified to form innovations. On the top of every major class, for instance, managerial and product financial innovations, allocation of codes was done adopting a tree structure. Incremental cluster analysis was done on the sub-levels of the tree. Then an analysis of the effect of announcements of innovations on market value was carried out. For each of the press dates in the clusters, a Three, Five- and Eleven-day windows in the date of the announcement was used to compute cumulative abnormal market-adjusted returns (CAR). Rolling Betas in 150 days was formed from the market daily adjusted returns. T-statistics that was computed from abnormal returns standard error during 80-day trading, 20 days before announcement date to determine the statistical significance of computing cumulative abnormal market-adjusted returns (CAR). The findings from this study were that similar clusters of innovations cross two depth of coding had a strong negative effect on market value. This was found to be the same results for combined analysis and firm-specific analysis. The above negative effect suggested that there existed uncertainty in extending a new brand in a new geographic area. Nonetheless, the data set small size cannot justify the claim that insignificant clusters of innovations do not affect firm market value. More observations of bigger sample size are likely to bring significant effect on market value. The study further revealed that new property opening innovations affected the hotel market value negatively.

Chuang et al. (2015) also did a research work on Co-creating e-service innovations in Taiwan. The effect of theory and practice of financial innovations on firm performance was the main topic of study. The main research objective was to determine the short and long-term effect of innovation announcements market value of tourism companies. Their study reviewed and employed past researches on the influence of innovations on market value in the Tourism service industry. A Variety

of innovation sources of information such as ProQuest, Eikon, Factivam databases was exploited by empirical research. The Market value figures of the service industry were extracted from the Stock exchange databases.

The changes in the market value of equity emanating from announcements of innovations in the tourism industry were the subjects of analysis. The period for this study was for 5 years from 2011 to 2016 and announcements are given out and analysed 111 tourism companies that were listed in the stock exchange market in Europe. The method that was chosen was able to detect abnormal changes in market value, the ability of the model to be applicable and generalize results. Three hundred ninety-eight financial service firms were obtained as the observations of the representative sample. The period in which the market value changes also known as event window was established regarding the significance of abnormal returns for one day. Z-test was used to verify the statistical significance of changes in the market value of the tourism company. Statistical measures such as dispersion, central tendency, peakedness and skewness were used to obtain the patterns that resulted from market value data changes. Surface and hierarchical regression models were used to test the service industry market value changes out of the innovation announcements. The results of this study revealed that innovations such digital services have a positive and significant effect on value creation hence improves firm value.

Gunday et al. (2011) conducted a study entitled “Effects of Innovation Types on Firm Performance”. The paper explored the influence of various innovations, namely product innovation, product innovation, marketing innovations and organizational innovations on several features of firm performance which include financial, market and production performance. The study covered 184 manufacturing companies in Turkey during the years 2006 and 2007 for 7 months. A theoretical framework was developed and tested empirically to identify the influence of innovations on firm performance using integrated innovation method.

A questionnaire was used to evaluate the significant innovation drivers and their effect on the performance of manufacturing firms empirically. The questionnaire for

the survey included 311 specific questions that were designed to evaluate a company's innovative efforts, the strategy of the business, Technology strategy, competitive priorities and market strategy on company performance. The findings of their study revealed that innovations have a positive effect on firm performance of manufacturing companies.

Son et al. (2011) did a study in the US on the impact of IT service innovation, specifically cloud computing on firm performance for 5 years between 2005 and 2010. The study employed event study methodology and analysed a sample of 183 announcements of adoption of cloud level adoption at the firm level.

The process of event study analysis that was adopted included, first abnormal returns that were as a result announcement of cloud computing was computed were calculated. Secondly, the normal return for the stock as if the event had not occurred was estimated. The effect of the innovation on market value was measured through a regression equation. The findings of this study revealed that cloud computing adoption announcements result to a positive increase in the market value of the IT companies.

Khansa et al. (2009) did a time-series study to establish whether decreasing Innovation Hurt the Stock Price of Information Security Firms in the US. 33 security software companies were sampled for 10 years period between 1998 and 2008. Time series regression models were employed to analyze the relationship between innovations- R&D intensity and the share value of US security companies.

The study concluded that there was a significant and positive relationship between R&D intensity patents innovations and the value of the market security companies in the US.

Cho, et al. (2005) examined the effect of innovativeness, profitability, growth variables on the market value at the firm level. Their study was built on a resource-based concept of a firm and innovation, quality and learning literature. They adopted the quality- innovativeness–performance model. This model describes how a firm's capability to balance innovativeness with quality steers profitability and

growth and consequently brings about higher market value. The results of structural equation models indicated that the level of innovativeness and quality mediates the relationship between growth and quality.

Dotzel et al. (2013) carried a study on the effect of Service innovativeness and firm value. They evaluated what determines service innovation and the relationship with firm value, company risk and customer satisfaction. They also determined the difference between p and e innovations. They established a conceptual framework and estimated equations on panel data of 1049 innovations for 5 years. Binomial regression approach was used. The findings revealed that there were paramount differences between e innovations and p innovations.

urther e-innovation such as new to market e- innovations showed a significant and positive effect on the company's value. Natural logarithm of a company which was measured by firm size innovation also showed a positive effect on market value. However, Natural logarithm of the firm's age in years as a proxy of firm age showed a significant adverse effect on market value.

Meng et al. (2015) did an empirical study on the effect of innovation on the market value of China's stock market. The main objective of their study was to determine the effect of communicating innovation on the market value of service firms in china. A conceptual model was formulated to identify the link between market value and innovations. The independent innovation variables that were used included debt to asset ratio, sales, size, asset turnover, degree of total leverage assets to sales ratio, the ratio of shares from top ten controlling shareholders, tradable shares, service/manufacturing industries. Debt and sales measures of innovation were found to have a significant negative effect on market value. Size, asset turnover, degree of total leverage assets to sales ratio, the ratio of shares from top ten controlling shareholders, tradable shares, service/manufacturing industries were found to have a significant positive effect on market value.

Ehie et al. (2010) carried a research on the Effect of R&D Investment on Firm Value in Manufacturing and Service Industries in the US for a sample of 26,500 companies in a period of 18 years. The study focused on R&D investment and firm performance

in service and manufacturing firms and evaluated their differences in contribution to firm value. The study revealed that for both manufacturing and service industries R&D investment contributed positively to market value.

Filson et al. (2002) did a study on the Impact of E-commerce Strategies on Firm Value. The e-commerce was lessons from Amazon.com and its early opponents. The study objective was to identify the effect of e-commerce innovations on market value. The independent variables that represented the innovations of e-commerce were as follows; alliances and acquisitions where product line expansion through/without alliances and acquisitions were used as proxies. Market growth is measured as the annual percentage growth in industry sales revenues. Acquisitions are measured as annual firm-level count of acquisitions, operating margin measured as the ratio of net income before depreciation to sales revenue, competitor's sales revenues to market size and Market growth utility. The event study methodology was applied to evaluate the innovations of Amazon.com, and its competitors namely; N2K, BarnesandNoble.com and CDNOW from the dates of their IPO end of 2001 and/or to their exit date. The findings demonstrated that alliances and acquisitions, market growth, acquisitions and operating margin measures of innovations revealed a positive and significant effect of innovations on the firm's market value. Contrarily, growth market utility and opponent innovation activity revealed an insignificant and negative effect of innovation on firm's market value.

Ho et al. (2005) did another study on the effect of Research and development and Advertising on Firm Value. The study focused on Manufacturing and Nonmanufacturing companies. R&D was used to measure spending on innovations for 15,039 companies in 40 years. Specifically, they used R&D intensity measured by a ration of R&D spending to revenue, R&D measured as squared R&D intensity and size measured by Natural logarithm of market capitalization as the innovations. The results revealed that innovations measured by R&D intensity revealed a positive and significant effect on firm value. On the other hand, R&D measured by squared R&D intensity and size that Natural logarithm of market capitalization showed a significant negative effect on firm value.

2.4.2 Agency Banking and Market Capitalization

An agent of a Bank is a commercial entity subcontracted by a commercial bank to offer precise services for the bank. Agents are readied with the necessary expertise to render vital banking services according to the specifications set by the banks with commercial bank key objective of providing the numerous banking services to their clients without going to the branch. The customers are, therefore offered the opportunity of obtaining financial service and products in the most convenient and nearest location. This reduces hindrances of financial inclusion, for example, cost and accessibility. Agency banking, as a strategy of expansion, depicts its concept from the branchless banking model into which the wordings are will use interchangeably. Branchless banking is a distribution channel approach used for offering financial services without depending on banks branches (Ivatury & Mars, 2008).

Chemutai (2017) researched the relationship between agency banking financial innovation on the performance of Kenyan commercial banks. Specific objectives of her research were to establish the effect of agency banking on deposit growth, reduction of costs and deposit growth in the Kenyan commercial banks. The researcher adopted a descriptive research design where 12 bank managers and 120 bank agents for banks that had initiated agency banking were sampled. Primary data was collected, and SPSS and Microsoft Excel were used to analyse the collected data. The study revealed that agency banking had a positive correlation with customer growth and customer deposits; hence the overall performance of the bank improved because of agency banking. Further, the study revealed that there was a positive correlation between cost reduction and agency banking, meaning that the adoption of agency banking would increase in market value or capitalization of the commercial banks.

A similar study on the link between agency banking innovation and Kenyan bank performance was conducted by (Wanga, 2015). Specifically, the study was to determine effect measures of agency banking like transactions commissions, capital adequacy and asset quality on bank performance. This study was based on bank-led

and non-bank-led and agency theories. It adopted a descriptive research design and the focus of the study was 43 commercial banks in Kenya. Quantitative secondary data was collected from the annual financial statements of the bank for a period of 4 years from 2010 to 2014. Collected data were analysed using SPSS and Microsoft excel. The study revealed that agency banking financial innovation has a statistically significant and positive effect on performance Kenyan commercial.

Dzomo et al. (2017) conducted a study on the link between Branchless innovations and performance of Kenyan commercial banks. The forms of branchless banking that formed the specific objectives for this study were agency banking and electronic banking. Therefore, the study focused on each of these variables and their effects on firm performance. The exploratory research design methodology was adopted, and a survey was conducted on 42 Kenyan commercial banks. Agency banking and bank performance data were obtained from CBK annual supervision reports and individual commercial banks financial reports. To measure agency banking, investment in agency banking was used and data analysis was done using STATA statistical software. The study revealed that agency banking as financial innovation and strategy used by banks had an insignificant and negative effect on the performance of banks.

Kamau (2012) did another study on the link between agency banking and performance of Kenyan commercial banks. The study comprised of collecting data of all commercial banks in Kenya for 2 years 2010 and 2011. Agency banking financial innovation was measured as the value of transactions and cash deposits in the agents banking outlets that were obtained from CBK annual supervisions reports. The Bank performance was measured using the return on equity. He adopted a descriptive design methodology and used a secondary method of data collection to collect the above variable. The regression analysis model was used to determine the link between agency banking and performance. The study revealed that agency banking had a significant negative effect on firm performance

Kimingi (2010) conducted an enquiry to examine the correlation between technological innovations and firm performance of Kenyan commercial banks. He

used descriptive and content methods of data analysis because both quantitative data and qualitative data were collected. Content analysis was utilized to analyze the qualitative data whereas to analyze the quantitative data, descriptive methodology of analysis was utilized. Technological innovations, for example, internet-based banking services, the mobile phone was found to have been adopted by commercial banks. Consequently, these technological innovations had contributed to improved bank sales, profits and return on equity hence led to a performance increase of banks in Kenya. The study concluded that modem technological innovations are recommended for banks to remain highly competitive in the banking industry.

Njoki and Aloko (2015) did an identical empirical study on the link between financial innovations and firm performance. They concluded that the various forms of financial innovations such as agency banking, online banking and mobile phone banking had a significant positive effect on bank performance in a period of 5 years between 2009 and 2013. Similarly, the performance of Kenyan banks was found to be positively affected by financial innovativeness and innovativeness dimension significantly.

2.4.3 Mobile Banking and Market Capitalization

According to Kato et al. (2014), the use of mobile phones to deliver banking services is defined as mobile banking. In delivering banking services through embracing mobile technology to conform with the improvement of technology in the banking sector, banks have recently gone through significant technological changes. In delivering accessibility and efficiency of banking services to customers with the absence of obstacles of time and location, this banking model becomes very useful.

The foundation of the banking industry is swayed by the speedy development and growth of information technology. Service bundling, process integration, monopolization of extensive branch network and scale economy strategies have recently been the areas studied in the banking industry (Fang, 2009). However, this basic theory of the combined model is questioned by the advancement of mobile and related technology. According to Wang et al. (2006), the increased number of customers using devices such as mobile has been due to the growth of wireless

technology. Fjermestad et al. (2006) indicated that the ever-changing new technology is changing, resulting in new approaches in many areas of business.

Bagudu et al. (2017) researched the relationship between internet banking innovations and performance of commercial banks in Nigeria. They used descriptive research methodology where survey questionnaires were used to establish the effect of mobile banking financial innovation on Bank performance in Nigerian Banks. The study targeted a population of 22 banks and one financial manager from each of the banks was sampled as a respondent. To select the 22 commercial banks, simple random method. The research revealed that mobile banking financial innovations positively and significantly affect banks performance in Nigeria

Abongo (2016) did another research on the link between mobile banking innovation and performance of Kenyan commercial banks. The target population was all the 43 commercial banks in Kenya as of 2014. The descriptive research methodology was adopted, and 200 respondents were sampled and analysed. To determine the relationship between the variables, spearman's rank correlation coefficient was used. Multiple linear regression model was used to determine the relationship between mobile banking and market value of the banks. The findings of this study revealed that mobile banking financial innovation has a significant negative effect on bank value hence capitalization.

Another study was conducted by Waweru (2012) to determine the link between financial innovation and risk management of Kenyan commercial banks. In his enquiry, data was collected from 18 sampled commercial banks. To analyse the data collected, regression analysis, correlation analysis, autocorrelation methods of data analysis were used. The study concluded that the overall risk management for banks was positively affected by the various financial innovation variables under study which included total new current and savings accounts, credit reference bureaus and automated trading system at the stock exchange. On the other hand, the risk management framework of the banks was found to be negatively influenced by mobile banking innovations. The study determined that financial innovations expose

various risks which include interest rate risks, strategic risk, credit risk, compliance risk, liquidity risk and influences mobile banking negatively.

Kathuo (2015) did a study on the link between mobile banking and the performance of Kenyan commercial banks. The methodology of research that he adopted was descriptive. The 42 Kenyan commercial banks that were in operation as of December 2014 formed the target population. Primary data collection was done through questionnaires. Descriptive analysis was applied to analyse quantitative data. The study concluded that mobile banking innovations have increased in the banking sector in Kenya. Further, mobile banking financial innovations were found to have a significant positive effect on the market value of Kenyan commercial banks. Consequently, the Bank's customer base increased hence the aggregate Bank's performance.

Globally, a study to establish the influence of IT in the banking industry was done by Shirley and Sushanta (2006) in the U.S. The study analysed how financial innovations were affected by information technology. The financial innovations in the study were electronic payments, security investments, internet banking. To estimate the effect of these financial innovations on the profitability of banks in the US, the researchers sampled a panel of 68 banks for a period of 20 years. The findings of the study revealed that higher IT innovations investments could lower bank profits; however, adoption of IT may lower costs in the bank. The study further revealed that to the extent of the network effect, the effect of IT financial innovations on a bank's financial performance is conditional. Low network effect on IT expenditures reduces payroll expenses, therefore, increasing profits and revenues and consequently, the market share of the banks. Nader (2011) conducted a study in Saudi Arabia in 2017 on the influence of financial innovations on the profit efficiency Saudi Arabian banks. The study determined that efficiency of banks in Saudi Arabia was positively affected by innovations such as the number of bank branches, number of ATMs and phone banking availability. Mobile banking, POSs and PCs were found not to improve the profits of the banks.

Mabrouk and Mamoghli (2010) carried out a study on the effect of financial innovations on the performance of emerging banking industry. Process and product financial innovations were the independent variables of this study. Product innovations included SMS and Telephone banking while process innovation studied was credit cards, debit cards, ATM. The two financial adoption behaviours were determined in the analysis, and this included the first mover in and imitator of the first mover's financial adoption behaviours. First mover product financial innovation initiative was found to increase profitability, whereas the profitability and efficiency of the banks were found to be positively influenced by process financial innovation initiative. Banks that imitate are less profitable and less efficient than first movers. Accounting-based measures such as ROA and ROE have been used in a majority of the researches in the area of financial innovations and performance of firms and a few markets based measures such as market capitalization (Heentigala & Armstrong, 2011).

2.4.4 Plastic Credit Card Innovation and Market Capitalization

According to CBK (2013), a credit card is a mode of payment through electronic data. It is a plastic card innovation which has a magnetic field that makes it possible for clients to make banking transactions. They are suitable and appropriate because customers do not need to carry large sums of cash. Credits cards are offered to Banks customers, which they use during unexpected and urgent circumstances or when a client uses more than he/she has budgeted. Credit cards are used to make purchases and withdrawals money from local ATMs without charges or global ATMs like master cards and VISA. Furthermore, they can as well be used to make purchases through phone or online.

According to Cohen (2005), credit cards are a remission card given to clients as a payment method. Cardholders of credit cards can purchase goods and services with a commitment to pay later. The issuer of the card establishes a rotating account. Customers can borrow funds for payment to a trader or take a cash advance. Banks have been hesitant in credit appraisal and approvals procedures because of the increased competition for lending, which has caused banks to enlarge their retail

networks resulting in increased risks. Failure of customers to repay obligations, portfolio risk of loans biased in the industry and irregular credit stress in the industry has caused credit risk. According to Cohen (2005), the complex interaction amongst several factors which includes client satisfaction, credit limit and generation of income has influenced the achievement of credit cards portfolio. Cohen further argued that in the developed countries, the strength that influences the economy is payments utilized through credit cards in comparison with personal savings and this is also true for developing economies.

Kyalo (2012) did research on the link between credit card financial innovation and performance of Kenyan commercial banks. The study objectives were to determine whether credit cards adoption improves or decrease Bank performance in Kenya. The adoption of Credit card innovation was measured by the credit cards numbers issued out by the Banks during the period, whereas the return on assets was used as the measure of performance. The researcher used casual research design and Secondary data was obtained from 7 commercial banks for a period of 5 years from 2009 to 2013. Multiple linear regression and OLS regression methods were conducted on the data obtained. The study determined that credit card innovation has a significant and positive effect on the performance of Kenyan commercial banks.

Tunay (2015) did research on the link between innovations and Performance of Kenyan commercial banks. Specifically, the study sought to examine the effect of electronic-based banking services innovations on the performance of Banks. He adopted the Panel data analysis methodology in the research. This study concluded that performance was highly significantly affected by electronic banking services. The outcome showed that some variables like the differences in the size and level of development of the countries, the socio-cultural structure and electronic banking infrastructure were found to vary with the expected outcome negatively. Bank Performance was also found to be negatively affected by the number of POS terminals and clients utilizing internet banking. This seems to contradict most of the studies in this area, as outlined above. From a different point of view, the number of bank credit/ debit cards and the ATM and number of branches ratio affect performance positively.

Kamal (2012) did an empirical study to establish the effect of electronic credit cards on Bank's Performance in Jordan. Credit card usage was measured as the proportion of investment and operation expenses related to credit cards. Bank performance was measured in terms of credit cards net income. SPSS was used to analyze the data. Simple linear regression models were used. The results indicated that credit card usage has a significant positive effect on bank performance.

2.4.5 Internet Banking and Market Capitalization

DeYoung (2007) contended that Internet banking as a comprehensive variety arrangement of client value included items and services utilizing internet and media transmission systems. Bringing in information into individual bookkeeping programming is additionally part of internet banking. Clients can screen all their records in a single place whether with their principal bank or with different establishments through internet banking that support account grouping. Internet banking is considered not a swap for the brick and mortar banking sectors but an elective conveyance channel for the banking administrations. The points of view of competition in retail banking have been adjusted/ altered by internet banking. As another conveyance channel, internet banking has increased widespread acknowledgement for performing different banking exchanges. Internet banking gives a chance to customers to lead banking exchanges at their simplicity and fulfilment. There are two strategies for offering Internet banking. To begin with, notwithstanding its conventional conveyance channels current keep money with physical workplaces can set up a site and offer Internet banking. Secondly, a bank might be set up as a virtual bank, branchless or Internet-only.

Malhotra and Singh (2009) did a study on the relationship between internet banking and performance and risk in Indian Banks. They studied information from a survey of 85 commercial banks in 2007. To establish the effect of internet banking on the performance of banks, the researchers used multiple regression and univariate analysis. The study determined that banks utilizing internet banking are likely to be large, more efficient in operations and will get more profits, meaning improved financial performance. They further contended that banks that have adopted internet

banking are likely to have much better and quality asset and are well managed to reduce the expenses for equipment and construction. On the other hand, they concluded that smaller banks that have adopted internet banking are likely to result in a decline in profitability, meaning a decrease in bank performance. Contrary, the study results revealed that for multiple regression analysis, internet banking financial innovation has a significant negative effect on firm value.

Jayakumar (2012) stated that innovative information technology could help banks to reduce the transaction cost and handle numerous transactions. Banks and customers can now offer customized products can while at home, easily access many services through the internet. Banks are embracing Customer Relationship Management [CRM] so that they can provide better services to their clients which are facilitated by the availability of conductive technology. Innovation in technology has increased fees hence increased the bank’s total income because of cross-selling products of insurance and securities firms.

Another investigation was led in India by Malhotra and Singh (2010) to set up the impact of financial innovations, explicitly internet banking on bank's performance. The investigation additionally looked to comprehend if, among banks giving internet banking, those that have given it to a generally lengthy timeframe performed superior to anything those that had as of late offered it. The financial performance data of 82 business banks were utilized, amid the time of 1998 to 2007, the univariate examination results from numerous relapses uncovered that accomplished web banks are more significant banks and have better working effectiveness proportions and futile on a conventional wellspring of financing contrasted and unpractised web banks just as non-web banks. In practically all different factors, there existed no measurably critical contrast in the execution of experienced and unpractised web banks. The different relapse discoveries unveiled that the benefit and involvement in the offering web saving money do not have any significant relationship. In this way, in the Indian managing an account condition, involvement in financial innovations by offering internet banking does not have any impact on the bank's financial innovation.

As indicated by Njenga, Kiragu and Opiyo (2014) on their examination of the effect of innovations on the performance of SACCOS in Nyeri, Kenya, it was inferred that there was a positive relationship between financial innovations and performance of SACCOs. Phone banking and internet banking were observed to be the primary drivers of the financial execution of SACCOs. The investigation suggests that more significant speculation ought to go into portable and web saving money since the two-drive benefit instead of ATM keeping money. A comparative report on the impact of money related advancement on the execution of business banks in Kenya by Mogaka (2011) uncovered that versatile saving money, ATM and card utilization contributed to the execution of business banks. The report also revealed that office managing an account like a bank development had a negative relationship with the budgetary execution of business banks. This is contrary to discoveries from a comparative investigation by Ngumi (2013) on the impact of bank advancement on money related execution of business banks in Kenya. This examination uncovered that cell phones had a higher directing impact than web benefits on the bank advancements while affecting monetary execution of business banks in Kenya. Given the discoveries of the investigation, it was resolved that bank advancements emphatically influence money related execution of business banks in Kenya.

As indicated by Ngari et al. (2015), banks in Kenya use money related advancements to outlast in the present condition distinguished by stiff challenge and aggressive banks items. The examination distinguished different imaginative items to stay aggressive in the market. The examination uncovered that banks in Kenya had grasped the innovations and present-day techniques for working, which is more secure and better contrasted with the old ones. This incorporate utilization of EFT electronic instalment exchange, mechanization in clearing through EFT, truncation or check imaging transmission utilize electronic banks exchange. The examination further uncovered that banks had been enlivened by the diverse premiums to follow distinctive money related developments. Charge cards are being grasped by the banks so as extend salary, benefits, and to lessen credit and liquidity dangers. Money related execution is a benefit and offers pieces of information about the capacity of the bank to embrace dangers and to extend its movement. The real markers utilized in the valuation for bank productivity and are pointers of money related execution

incorporates return on value, which is processed as Net salary separated by Average Equity, Return on Asset registered as Net pay partitioned by Total resources and the marker of monetary use figured as Equity isolated by Total Assets.

Agboola (2007) argued that the uses of innovation and Internet managing an account have brought about enormous changes in the keeping money industry. He focused on that banks ought to embrace innovation, modernize their frameworks to enhance quality, proficiency and speed in giving administrations; else they may lose their offer in the aggressive business with the adversaries. Customer desires are dynamic and change because of innovation enhancement. Multichannel conveyance display is embraced and built up to be a triumph to fulfil those curbed needs. Such a framework utilizes a brought together interface over all channels. Customer's inclinations and exercises are diverted crosswise over mediums and in this manner, guarantee usefulness ends up dependable despite customer's favoured gadget. This expansion of customers' trust and dependability to the banks is winding up progressively imperative to Vietnamese banks in the combination slant. Aside from those indirect impacts, a cutting-edge administration, for example, Internet saving money can affect banks' execution, for example, bank pay, working expenses, and subsequently bank gainfulness.

2.4.6 Bank Ownership and Market Capitalization

According to Ongore (2011), the idea of ownership can be illustrated along with two schools of thought: ownership concentration and ownership mix. Ownership concentration is the percentage of shares held (largest shareholding) in the company by few shareholders and ownership mix defines the characteristic of the shareholders.

On the correlation between ownership & Market value, scholars came up with divergent results. For example, most studies correlate with ownership, board structure and executive compensation and their effect on market value and performance. The specific concern in the effect of MO on market value and performance in the banking industry is also relatively current (Mohamed et al., 2012). Claessens et al. (2000) argued that local banks' value is larger in comparison

with their foreign counterparts in developed countries and the contrary is correct in developing countries. The ownership of the bank is one of the determinants explaining the performance of banks across; however, the size and orientation of its effect remained undetermined. Some scholars have claimed that foreign-owned firms operate better with big profit margins and lesser costs in comparison with locally owned banks. The reason given was because foreign-owned firms are thought to have knowledgeable management competencies in other countries over many years. Besides, foreign banks often tailor-make and adapt their operating systems that are effective in their origin countries (Ongore, 2011).

Dagnachew (2017) indicated that overseas-owned banks usually provide better expertise and technical capacity; this then overflows to the other banking system. They force competitive thrust on local banks, therefore expanding the efficiency of financial intermediation and they offer additional steadiness to the financial system because they are capable of drawing on liquidity resources from their parent's banks and permit to enter international markets.

According to Kamau (2009) in his study to identify the determinants of efficiency and productivity of banking industry in Kenya, found out that the performance of local banking sector was affected by the type of ownership of the bank. He further claimed that overseas banks generally bring with them superior skills and knowledge capacity. Foreign banks impose competitive pressure on domestic banks. They get liquidity resources from their country of origin banks because of their accessibility to international markets.

Beck and Fuchs (2004) determined that overseas-owned banks are highly profitable than their local peers in developing countries. They also found out that overseas-owned banks were lesser profitable than domestic banks in industrial countries, possibly due to advantages obtained from tax reliefs, technological cost-effectiveness and other preferential treatments. However, locally-owned banks are more likely to benefit from the information privilege they have regarding the local market compared to overseas banks. Their study categorized bank ownership into foreign, both foreign and domestic and domestic. Foreign banks are a vital source of financial

vulnerability. The reason would be that they might begin to withdraw funds so that they can nullify losses in the home country and expand the opportunities of crumpling of their domestic-based subsidiaries. Contrary, inter-country comparisons show that overseas banks may have better capitalization, improved expertise and technical capacity, which then spill over to the rest of the banking system

Ilduara and Evis (2014) investigated the correlation between ownership concentration and market capitalization of European banks, and the importance of the institutional environment in modelling this relationship. They adopted GMM dynamic predictor on a sampled European bank over a period of 13 years (1993–2005). The study revealed that a negative influence of ownership concentration on market capitalization that was measured by Tobin's Q. However, this effect differed across divergent institutional settings. In contrast, greater ownership concentration led to a smaller market value mostly in the countries belonging to German legal family; the effect of ownership application was positive in Scandinavia. They suggested that, apart from the legal protection of small investors, the dissimilarities in the effect of ownership concentration across the countries could be because of the identity of the principal owners, i.e. financial institutions in Germany and trusts and foundations in Scandinavia. This, therefore, implied that the curtailment of shareholdings in banks could remove governance problems in some countries, but lower market valuation in others.

Predag and Milani (2014) did a study on the effect of the composition of ownership on the profitability of commercial banks in Europe. The researchers sampled 74 banks from four transition economies for 5 years between 2005 and 2010. A panel data set of 377 observations were used in which their relationship was done using OLS regression analysis. The study concluded that there was a significant negative correlation between ownership and profitability. They also found out that privately-held domestic banks outperformed state-owned and foreign banks. Further, the study concluded that bank size and bank capitalization were paramount variables that influenced the profitability of the Banks.

A study conducted by Kiruri (2013) on the influence of ownership composition on bank profitability in Kenya demonstrated that ownership had a significant negative effect on the profitability of banks whereas domestic ownership and foreign ownership had a significant positive effect on bank profitability. The study determined that higher ownership and state ownership lead to lower performance in commercial banks while high bank performance was found to be in domestic and foreign-owned banks.

Micco, Panizza and Yanez (2004) carried out an empirical study on ownership of banks and performance. The study adopted a new dataset to assess as the correlation between performance and bank ownership, providing distinct estimations for developing and industrial countries. The study concluded that state-owned banks situated in developing countries had lower profitability and higher costs compared with their private counterparts. The contrary was true for foreign-owned banks. The paper established that there was no strong correlation between ownership and performance for banks located in industrial countries. To test whether political considerations controlled the differential in performance between public and private banks, the study checked whether this differential widened during election years; it found strong support for this hypothesis.

Iannotta, Nocera and Sironi (2007) study assessed the effect of alternative ownership models, together with ownership level, on profitability, cost-effectiveness and risk by comparing the performance and risk of a sample of 181 large banks from 15 European countries over the 5 years, that is, from 1999 to 2004. The study determined that after managing bank characteristics, country and time effect, mutual banks and government-owned banks exhibited low profit than privately owned banks, despite their low costs. Secondly, public industry banks had poor loan quality and higher insolvency risk than other types of banks while mutual banks had better loan quality and low asset risk than both private and public-sector banks. Finally, whereas ownership does not significantly influence the profitability of banks, ownership is related to better loan quality, lower asset risk and lower insolvency risk. Flamini et al. (2009) study on the effect of ownership on bank performance using a panel data set of 389 banks in 44 Sub- Saharan African countries. The findings

revealed that the banks had high profit in comparison to other regions; apart from the credit, higher ROA was related to larger bank size, activity diversification, and ownership

Altunbas et al. (2001) researched the link between ownership and efficiency of banks in Germany. The study adopted a range of approaches to model cost and profit inefficiencies in addition to technical change for different ownership types in the German banking industry. The study revealed little evidence to propose that privately owned banks are more efficient than their mutual and public industry peers. While all three bank ownership types take advantage from universal economies of scale, inefficiency measures showed that public and mutual banks have slight cost and profit advantages over their private-sector competitors.

Dagnachew (2017) found out that foreign banks perform better in developing countries in comparison with those in developed countries. Therefore, they concluded that domestic banks perform relatively better in advanced countries than when they are in growing economies. They further indicated that share price increment of foreign banks results in lower profitability of local banks in developing economies. The question therefore was, Is the performance of commercial banks affected by bank ownership? Studies reviewed concluded that performance of banks is likely to be influenced by internal and external factors.

Market value is referred to as the price that an asset would be sold in a securities market. Market capitalization is also referred to as market value. It is the value that investors place on a company at a given point in time, as represented by the total value of a currency shares outstanding of a company's stock. It is computed as the current market price of a share multiplied by the outstanding shares of a company. It is also known as market cap for short , referring to the total value of stock in the exchange market. Market cap is one of the proper ways to evaluate the value of a given company quickly. This is because the basis of stock prices is the future expectations by investors of an increase in a company's returns or earnings (Business dictionary, 2011). Amadeo (2016) observed that as earnings go up, the investors tend to bid more for the stock.

2.5 Critique of Existing Literature Relevant to the Study

A review of empirical literature above revealed mixed results on the correlation between financial innovations and market capitalization measured by market value. For instance, the studies by Chuang, et al. (2015), Gunday, et al. (2011), Khansa, et al. (2009), Cho, et al. (2005), Meng, et al. (2015), revealed a positive relationship between innovations and market value of service industry like Hotels. Contrary, some other researchers on the same area of the study found a significant negative link between financial innovations and market value of service firms, for example, Nicolau et al. (2013), Zach, et al. (2015), Dotzel, et al. (2013), Filson, et al. (2002), Ho, et al. (2005). Furthermore, the majority of these studies were also conducted in developing countries.

Similarly, related studies on the effect of financial innovations on the performance of commercial banks in Kenya revealed mixed results. For instance, Chemutai (2017), Wanga (2015) and Kimingi (2010) concluded that Agency banking financial innovations have a significant positive effect on bank performance. In contrast, Dzomo et al. (2017) and Kamau (2012) concluded that Agency banking has an insignificant effect on the performance of commercial Banks in Kenya. While Bagudu et al. (2017), Kathuo (2015), Shirley and Sushanta (2006) and Mabrouk and Mamoghli (2010) found out that Mobile banking financial innovations have a positive effect on firm performance. Abongo (2016) and Waweru (2012) found a significant negative effect of mobile banking innovations on bank performance. Tunay (2015) and Kamal (2012) concluded that credit has a positive effect on bank performance. Studies by DeYoung (2007), Jayakumar (2012), Njenga, Kiragu and Opiyo (2014), Ngari, et al. (2015) and Agboola (2007) revealed a significant positive effect of electronic banking financial innovation bank performance contrary to researches by Malhotra and Singh (2009), that revealed a negative effect of electronic financial innovations on firm performance. Researchers Beck and Fuchs (2004), Micco, Panizza and Yanez (2004), Kiruri (2013), Flamini, et al. (2009) and Dagnachew, (2017) revealed that bank ownership structure determines firm performance. Kamau (2009), Ilduara and Evis (2014), Predag and Milani (2014),

Iannotta, Nocera and Sironi (2007) and Altunbas et al (2001) concluded that Bank ownership has a significant negative effect on the firm performance.

Most of the studies reviewed above-adopted accounting measures of firm performance in commercial banks. According to Aras et al. (2010), accounting-based measures are said to use historical aspects of a firm's financial performance and are subject to bias, as they are affected by managerial manipulation as well as by various accounting procedures. According to Raed, Mohammed, Idries and Ali (2015), market-based measures focus on a firm's future performance as opposed to past performance; thus, they are less susceptible to managerial manipulation and different accounting procedures. It is due to this empirical inconclusively that the current study sought to determine the effect of financial innovations on market capitalization commercial banks listed in NSE in Kenya. A variety of financial innovations contributing to 75% of the value of transactions in the banks, namely; Agency Banking financial innovations, Mobile banking financial innovations, Plastic credit card innovations, Internet banking financial innovations and ownership structure of banks, were studied on the effect of the market capitalization of commercial banks that was measured by market value.

2.6 Research Gap

The literature from past studies reviewed demonstrated that past researchers contemplated a couple of factors of financial innovations while this investigation secured extra vital factors that were forgotten by past investigations like mobile banking, agency banking, Plastic charge card innovation and internet banking. The greater part of the studies explored did not include moderating variable. This investigation used bank ownership as a moderating variable between the effects of financial innovation on market capitalization—the depended-on market capitalization measuring market value and consequently, an organization's performance. Market value has the advantage, that is, it depends on development prospects. If investors are rational, share costs ought to mirror the present value of future cash-in and out and, in this manner; it establishes an excellent pointer to quantify the impact of innovation exercises on bank performance and financial development in a nation.

As per Juan (2012), market capitalization is characterized as the number of offers increased by the offer cost. It is viewed as the best-fair indicator of the estimation of any speculation. In an effective securities exchange, share costs estimate all the accessible information in an organization. Correspondingly, any deviation on an association's share price will be reflected, without inclination and adjustments to its future cash flows. In this manner, the reception of new data on innovation permits an evaluation of offer value conduct to dissect the fundamental acclimation unequivocally to fair market forecasts on returns for an opportunity to come on the referenced development movement. This grants for detachment of profits got from innovation activities by isolating it from the impact of different activities. The appropriation of market performance underpins the evaluation of the impact of financial innovation on performance by foreseeing fair-minded market appraises on future benefits. As plot above, market value is a forward-looking measure of performance that overcomes every one of the troubles of the customarily received in reverse looking firm profitability, (for example, bookkeeping measures).

Martíne and Orfila (2010) repeated the strong heterogeneity and expansive array of perplexing and exceedingly creative methodologies ought to be led in service enterprises like Banks and hotels. This makes the study increasingly comprehensive. From the review of pertinent literature in financial innovation, it has been resolved that there are relatively few investigations done in Kenya on the relationship between financial innovations and market capitalization of Kenyan commercial banks and the not many that are done on this area omitted. This study incorporated the moderating effect of bank ownership on the effect of financial innovation on the market capitalization of listed commercial banks in Kenya. Most of the studies reviewed on this topic studied the effect of financial innovation on accounting indicators of financial performance; however, a few looked at market-based indicators of financial innovation like return on shares.

This academic study has significant theoretical and empirical contribution in both academics around financial innovations and banking industry managerial decision making. Regarding academic contribution, the finding that market capitalization is positively influenced by financial innovation indicates that this type of investment

can be regarded as appropriate. Due to this fact alongside the outcome that different financial innovations have varying effects on market capitalization suggests that when the analysts pursue an in-depth evaluation, varying kinds of financial innovations and distinct company performance measurements should be adopted. The review of the conceptual, empirical and theoretical perspective of literature review, it is crystal clear that there are mixed conclusions and a research gap exist on the link between financial innovations and market capitalization in the banking industry of developing countries like Kenya.

In finance theory, the Modigliani theoretical preposition, Efficient Market Hypothesis and Random Walk theories of market prices concur that prices of the securities in a stock market are difficult to be predicted; however, these have a direct conflict with technical analysis which postulates that the future price of a security can be predicted and forecasted based on the information and therefore impossible to predict market because prices of stock reflect all information available. Other theories of financial innovation have reported a link between financial innovation and market value, for instance, Silber's theory, Schumpeter theory, Merton Market efficiency theory and Transaction cost theory. The principal objective of this investigation was to establish the effect of financial innovation.

As for managerial contribution, using market capitalization as a measure of market value allows for the examination of the effect of financial innovation on performance by estimating market predictions on future profits. This method is a forward-looking measure of firm performance and it overcomes the backwards-looking traditional method of assessing firm profitability. The use of share prices to determine the effect of financial innovation can be used by the management to determine if there is any need to proceed with a type of innovation. This study, therefore, filled these relevant gaps in the literature by studying the effect of financial innovation on the market capitalization of listed commercial banks in Kenya.

2.7 Summary of Literature Reviewed

These diverse results and unconventional views from different pieces of literature in different countries regarding the study of the effect of financial innovation on the performance of banks are significantly because of lack of in-depth and all-inclusive analysis of multiple and current financial innovations. This study took a departure from past studies and studied several financial innovations and how they correlate with market capitalization. This study addressed the confounding theoretical, empirical and contextual orientation on the link between financial innovation and market capitalization.

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Furthermore, there are numerous studies on the relationship between financial innovations and profitability majorly done in advanced and in emerging economies, leaving an insufficiency of innovation- performance literature for Africa and Kenya in particular. This all-conclusive study addressed this literature interlude.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter puts forward description of procedures and approaches the study adopted while organizing and carrying out this work. The methods include research design, study population, samples size, data collection procedure, data analysis and presentation. The chapter also describes the statistical methods used in data analysis and presentation. The measurements of variables and data analysis techniques were also discussed in this chapter.

3.2 Research Design

Research design is an all-inclusive scheme of progression of operations that a researcher expects to carry out to attain the objectives of a research study (Srivastava & Rego, 2011). This study used a descriptive research design to describe the effect of various financial innovations in on market capitalization of listed Kenyan commercial banks. Kothari (2017) defines a descriptive research model as a plan which pursues and identifies precisely the attributes for a person, circumstance or a category. Therefore, this perspective was suitable for this study, since the study collected in-depth evidence by use of descriptions and is useful for singling out variables. Descriptive research has the benefit that the subject is noted in a completely natural and unaltered natural environment and that it permits respondents to reply in their time frame (Cooper & Schindler, 2003).

A census study was done on the 11 listed commercial banks in operation in Kenya during the period, 2013 to 2017 To obtain the broad objective of this study.

3.3 Target Population

According to Lavrakas (2008), the population is either limited or unending gathering of people. A population is the total collection of individuals, occasions or items with comparable features which adjust to a predefined depiction (Mugenda &Mugenda,

2003). The objective population for this investigation was the 11 listed Kenyan commercial banks in the Nairobi Securities Exchange (NSE 2017), as shown in Table 3.1.

Table 3.1: Listed Banks in NSE

Number	Bank Name
1	National Bank of Kenya
2	Housing Finance
3	Stanbic Holdings
4	NIC Bank
5	Diamond Trust Bank Kenya
6	I&M Holdings
7	Barclays Bank of Kenya
8	KCB Group
9	Standard Chartered Bank Kenya
10	Cooperative Bank of Kenya
11	Equity Group Holdings

Source: NSE, 2017

A Census study was adopted because of the reason that the target population was small. The choice for the listed banks was made because data on the dependent variable market capitalization is readily available at NSE and CBK annual reports and therefore the ease in determining the relationship between financial innovation on Market capitalization.

3.4 Data Collection Procedure

The procedure of collecting data is a method by which data is gotten from the chosen subjects of a study. Data was collected from secondary sources. The sources of data collection were financial statements available at NSE and CBK quarterly reports. According to Zhang et al. (2014), a census study is more direct and appropriate to be applied in a local setting where the population frame exists with certainty. Dawson

(2009) argued that data obtained from information used by other researchers and writers on a subject is called secondary data. Cooper et al. (2006) further commended that in appertaining historical documents and reports, secondary data proves to be a fundamental qualitative technique. Furthermore, according to Ngumi (2013), since data collection is expensive and time-consuming during research, the analysis of secondary data becomes suitable as it is economical and efficient.

The study, therefore, used a census technique and collected data for both independent and dependent variables from all the 11 Kenyan commercial banks listed in the Nairobi security exchange. Data from secondary sources were obtained and then analysed using both descriptive and inferential statistics.

3.5 Data Analysis and Presentation

This Section explains how data was analysed and presented. The data was analysed using both descriptive and inferential analysis methods. Statistical Package for Social Sciences (SPSS) version 24.0, STATA and Eviews statistical software were used for the analysis. The Section discusses the approach used by the study regarding descriptive statistics and relationship analysis, conceptual model, measurement of variables, the empirical models and diagnostic tests.

3.5.1 Data Collection Procedures

Data obtained from secondary sources were used for both the dependent and independent variables. The data was obtained from the bank's annual published financial statements available at NSE website and CBK quarterly reports. The data involved contained Market capitalization (MC), which was the dependent variable. Other variables were: Agency banking (AB), Internet banking (IB), Mobile Banking (MB) and Plastic credit card (PCC) which were the independent variables and finally bank ownership which was the moderating variable. The variables were transformed into natural logarithm to work with smaller figures. The data was collected over a period of five years every quarter in the eleven banks listed in Nairobi stock exchange leading to a total number of 220 observations.

3.5.2 Data Analysis

Polit and Beck (2003) argued that quantitative information analysis is typically done using statistical methods. Statistical data analyses encompass a broad scope of procedures, from simple procedures like computing to average and sophisticated and complex techniques. Although some techniques are difficult to compute, unexpressed reasoning for statistical tests is that they are comparatively easy to grasp. Furthermore, detailed complex mathematical operations have been resolved by the use of computers.

The data obtained was then analysed using descriptive statistics and inferential statistics. Descriptive statistic techniques were used to organize and present data. The techniques comprise of diagrams, tabulation, graphs and numerical procedures aimed at summarizing the data that help in analysis. Quantitative analyses of the crucial features of the variables were done using descriptive statistics like frequency, mean, and standard deviation. Testing of statistical significance in the effect of different explanatory variables (Plastic credit card innovation, Agency banking, Internet banking, Mobile banking) on the dependent variable (Market Capitalization of the Bank), panel data analysis was adopted. Again, to check on the causality relationship, the study performed a granger causality test.

To help in data analysis, STATA, SPSS and Eviews statistical packages were adopted because of the reason that they have in-build formulas. SPSS is an all-inclusive system used for the analysis of data and takes data from any type of file and tabulated reports, charts, compare means, correlation and numerous other methods of data analysis are generated from it (Microsoft Corporation, 2003). Eviews works very well with econometric data and hence the choice of the package. Students t-statistic was employed to establish the relative importance of every independent variable in relationship with market capitalization.

3.5.3 Empirical Model

Panel regression analysis models were employed to examine the relationship of innovations in the financial sector and market capitalization of Kenyan commercial

banks listed in the Nairobi securities exchange. Greene (2008) estimated a panel regression that was linear because the data obtained had both time series and cross-sectional measurements. This study, therefore, adopted a panel data analysis as the data had both cross-section (banks) and time series aspects (quarterly data).

It has been found that panel data analysis has more advantages compared to either cross-section or time series in isolation. This because of the reason that it permits the researcher to detect and explain heterogeneity that is not easily observable. According to Balgati (2005), utilizing panel data empowers one to accomplish a higher sample size in comparison to time-series and cross-sectional since both aspects have been captured under the panel. Panel data gives more consistent and exceptionally enormous information. It likewise gives information that includes less collinearity inside the factors than cross-sectional or time-series information. Highly reliable predictions and sophisticated behavioural representations can be tested with less limiting presuppositions because of increased informative data. Because this study concentrated on the 11 commercial banks as listed in the NSE in Kenya, use of cross-section data solely would have resulted to a small sample size however after integrating time dimension of five years quarterly for each of the response and explanatory variables observed, and the sample was expanded to 220 observations. This broad sample observation obtained by the researcher enabled the inquiry to meet asymptotic requirements (Gujarati, 2003).

3.5.4 Panel Data Models

Panel data analysis involves three methods, namely: i) Pooled OLS model, ii) Fixed-effects model and iii)Random-effects model. Panel data models examine fixed and random effects of individual (group) or time. The core difference between fixed and random effect models lies in the role of dummy variables. A parameter estimate of a dummy variable is a part of the intercept in a fixed-effect model and an error component in a random effect model. Slopes remain the same across a group or time period in either fixed or random-effect model.

The first step is to start with Pooled OLS and check whether the model is significant, the second step is to test whether to choose the model with the fixed effects or the

model with the Random effects. If the model with the Random-effects is deemed appropriate through appropriate statistical tests, then a further test would not be required. If the Fixed effect model is the appropriate model, then the Hausman test is used to check further the appropriate model between the Fixed-effects and the Random-effects model.

3.5.4.1 Pooled OLS

If the individual effect (cross-sectional or time-specific effect) does not exist, ordinary least squares (OLS) produce efficient and consistent parameter estimates. The pooled OLS posits no difference in intercept and slopes across banks and time period where X_1= Agency banking, X_2= Mobile banking, X_3= Plastic credit card innovations, X_4= Internet Banking and Y is market capitalization for a bank.

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon_i \quad (3.1)$$

Where;

Y_{it} = Dependent variable representing market capitalization for a bank i at a given time t

t denotes time on quarterly basis t =2013q1, ... ,2017q4

$X_1, \dots, X_4$= are explanatory variables

$\beta_1, \dots, \beta_4$= coefficients of the independent variables being estimated

β_0 = a constant term,

ε_{it} is a vector of the error term.

Pooled OLS consists of five core assumptions (Greene, 2008: 11-19; Kennedy, 2008: 41-42).

1. **Linearity** says that the dependent variable is formulated as a linear function of a set of independent variables and the error (disturbance) term.
2. **Exogeneity** says that the expected value of disturbances is zero or disturbances are not correlated with any regressors.
3. Disturbances have the same variance (**3.a homoskedasticity**) and are not related to one another (**3.b non-autocorrelation**)
4. The observations on the independent variable are **not stochastic** but fixed in repeated samples without measurement errors.
5. **Full rank** assumption says that there is no exact linear relationship among independent variables (no multicollinearity).

3.5.4.2 Fixed Effects Model

Fixed Effects Model (FE) expects that contrasts between people can be suited from the various intercept. Distinctive intercept can happen because of contrasts in work, organizational, and impetus cultures to appraise the model of Fixed Effects panel data utilizing a dummy variable strategy to catch the contrasts between intercept organizations. In any case, the intercept is the same between organizations. This estimation model is frequently likewise called the method of Least Squares Dummy Variable (LSDV). The model of fixed effects varies from the regular impact, yet at the same time utilizes the typical least-square guideline. The suspicion of demonstrating that delivers a consistent intercept for each cross-section and time is viewed as less sensible, so more models are expected to catch the distinction. Fixed effects expect that contrasts between people (cross-section) can be obliged from various intercepts. The fake variable method is utilized to evaluate the Fixed Effects Model with various intercepts between people. Such estimation models are frequently alluded to as the Least Squares Dummy Variable procedure or contracted LSDV.

The general equation of the fixed effects model is as follows:

$$Y_{it} = (\beta_0 + u_i) + \beta X'_{it} + \varepsilon_{it} \quad \text{..... (3.2)}$$

where u_i is a fixed effect specific to individual bank.

In this study the LSDV estimation was utilized to estimate the fixed effects model:

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_1 b_1 + \mu_2 b_2 + \mu_3 b_3 + \cdots + \mu_{10} b_{10} + \varepsilon_i$$

where;

Y_{it} = Dependent variable representing market capitalization for a bank i at a given time t

b_1,…, b_{10} = dummy coefficients for listed banks where i = 1,...,11 banks, b_{11} in this case, was excluded from the regression equation to avoid perfect multicollinearity

t =denotes time on quarterly basis t =2013q1, 2017q4

$X's$= are explanatory variables

β's = coefficients of the explanatory factors being estimated,

β_0 = a constant term of the model,

ε_{it}= a vector error term.

3.5.4.3 Random Effect Model

Random Effect Model (FE) appraises panel data where interference factors might be interconnected among time and between people/items. In the model with Random Effects, the contrast between intercepts is accommodated by the error terms of each organization. The upside of utilizing this model is that it does away with heteroscedasticity entirely. This model is likewise called the Error Component Model (ECM) or Generalized Least Square (GLS) method. On a fundamental level, the model of the random effect is unique concerning the PLS and fixed-effect models, particularly, this model does not utilize the guideline of standard least-square but rather utilizing the rule maximum likelihood or general least square. This model aids in taking care of the issue by utilizing the residual variable. Residuals might be interconnected between time aspect and between people/individuals or cross-section and henceforth this model expect that there is a distinction of catch for every person and the intercept is a random variable. Along these lines, in the random-effects model, there are two residual parts. The first is the residual where the residual is a blend of cross-section and time series. The second residual is an individual one which is a random characteristic of the i-th unit perception and stays consistently.

The general equation for the random effects model is as follows:

$$Y_{it} = \beta_0 + \beta X'_{it} + (u_i + \varepsilon_{it}) \quad \text{..... (3.3)}$$

where u_i is a random effect specific to individual bank.

For $i = 1,2,\dots,N$ and $t = 1,2,\dots,T$ where, N is the number of banks (11 in this study), T is the number of periods (number quarters in the five years), $(u_i + \varepsilon_{it})$ is the residual of both cross-section and time series.

A random-effect model assumes that individual effect (heterogeneity) is not correlated with any regressor and then estimates error variance specific to groups (or times). Hence, u_i is an individual specific random heterogeneity or a component of

the composite error term. This is why a random effect model is also called an error component model. The intercept and slopes of regressors are the same across the individual. The difference among banks (or periods) lies in their specific errors, not in their intercepts.

3.5.4.4 Moderation Model

Equation 3.4 below was used to establish the moderating effect of Bank ownership on the relationship between Financial innovation (Agency banking, Mobile banking, Plastic credit card innovation, Internet banking) on market capitalization among listed banks in NSE in Kenya.

$$Y_{it} = \beta_0 + \beta_1 X_1 * X_5 + \beta_2 X_2 * X_5 + \beta_3 X_3 * X_5 + \beta_4 X_4 * X_5 + \varepsilon_{it} \ldots\ldots\ldots \quad (3.4)$$

Where: X_5= Moderating variable= Bank Ownership (0=Local, 1=Foreign).

3.6 Operationalization of Variables

All items of the variables were operationalized and measured as follows:

Table 3.2: Variable Measurement

Category of variables	Variable	Measurement
Dependent Variable	Market Capitalization	This is the market value for bank i at time t. It is computed as Natural Logarithm of No. of outstanding shares multiplied by the Market price per share for each quarter of the year for 5 years from 2013 to 2017 (Chessar, 2015).
Independent Variables	Financial innovation Variables	
	Agency Banking	This is Agency banking of Bank i at a time t calculated as the Natural logarithm of the total value of transactions of Quarterly cash deposits, cash Withdrawals, Payment of bills, Funds Transfer through Agency banking for each quarter of the year for 5 years from 2013 to 2017 (Chipeta et al., 2018).
	Mobile Banking	This is Mobile Banking of Bank i at a time t calculated as the Natural logarithm of the total value of quarterly mobile deposits, Withdrawals, mobile Transfers, mobile charges through Mobile banking, for each quarter of the year for 5 years from 2013 to 2017 (Chipeta et al., 2018).
	Plastic credit card innovation	This is Plastic credit card innovations of Bank i a at time t calculated as the Natural logarithm of the total of the value of transactions Quarterly interest on credit, drawing/Withdrawals and transfers through plastic credit cards, for each quarter of the year for 5 years from 2013 to 2017 (Odhiambo et al., 2012).
	Internet Banking	Internet Banking of Bank i at time t, computed as the Natural Logarithm of the total value of transactions interest on credit, drawing/Withdrawals and transfers through of internet banking for each quarter of the year for 5 years from 2013 to 2017 (Chipeta et al., 2018).
Moderating Variable		
	Bank Ownership	Dummy Variables 0 and 1 to represent ownership of commercial banks listed in NSE, where 0=Locally owned; 1=Foreign owned

3.7 Diagnostic tests

Executing diagnostic examinations on the data permits the researcher to identify the most suitable technique.

3.7.1 Linearity

Linearity is a characteristic of a mathematical association or function which implies that it can be represented graphically as a linear line. Linearity examines at the accuracy of the observations over the full range of the device. The pooled OLS model was tested for linearity to determine if the equation is constructive in fitting the data. An indispensable test in more than one variable linear regression is whether the slope is zero (i.e. whether the predictor variable X has a significant effect on the criterion variable Y). In more than one variable linear regression models, t-tests and F tests of the regression generate identical results because t^2 is the same as F (Cooper & Schindler, 2003).

3.7.2 Normality

Brooks (2008) argued that tests of normality are usually used to find out whether a given data is well-formulated and aligned to normal distribution. They are also used to establish if any random variable unexpressed in the data is usually distributed. Shapiro-Wilk and Kolmogorov-Smirnov normality tests were applied in this study.

The hypotheses used are:

Ho: The sample data are not significantly different than a normal population.

Ha: The sample data are significantly different than a normal population.

When testing for normality: Probabilities > 0.05 indicate that the data are normal.

Probabilities < 0.05 indicate that the data are NOT normal.

3.7.3 Multicollinearity

Multicollinearity occurs in the data when two or more independent variables are highly correlated. Two main methods were used in facilitating to detect the existence of multicollinearity: tolerance test and Variance Inflation Factor (V.I.F.) (Velnampy, 2011).

3.7.4 Heteroscedasticity

Heteroscedasticity problem arises in the data when the deviation of the residuals is not uniform across all measurements. This may be because of sub-population differences; the model is not correctly specified or if there are any other intervention effect in the data or omission of essential variables from the model. To check this problem, the researcher ensured that the model was correctly specified as contextualized above. This problem was checked by plotting error term observations or residuals against a Z factor. Heteroscedasticity becomes a problem when the error term observations swing further from zero as one move to the right-fan shaped patterns (Halcoussis, 2005), but the random effects does not assume constant variance in error terms. The Breusch-Pagan Lagrange multiplier (LM) test examines if any random effect exists. The null hypothesis is that individual-specific or time-specific error variance components are zero: H_0=Variance=0. If the null hypothesis is

not rejected, the pooled OLS is preferred; otherwise, the random effect model is better (Torres-Reyna, 2007).

3.7.5 Autocorrelation

Autocorrelation alludes to the relationship, not between two (at least two) distinct factors, but between the progressive estimations of a similar variable. It is a numerical portrayal of the level of closeness between a given time arrangement and a lagged rendition of itself over progressive time intervals. An autocorrelation was tested using the Durbin-Watson (D-W) statistical test. Gujarat (2009) stated that if the Durbin-Watson value is under 1.0 or more prominent than 3.0, at that point, there might be cause for concern.

3.7.6 Stationarity test

A Stationarity test was conducted in the study to determine the time series of statistical features found in the data used in this study. The main objective of this test was to ensure that the data was stationary. A stationary time series data is one that exhibits near the constant mean, variance and autocorrelation. Stationarity was examined by performing a unit root test. A unit root is an element of procedures that develops through time that can cause issues in measurable deduction, including time series models.

3.7.7 Granger Causality

The structures of the causal relationships between variables were analysed through the Granger causality approach. The Granger causality test is a statistical hypothesis test for determining whether a one-time series is useful for forecasting another. If the probability value is less than any α level, then the hypothesis would be rejected at that level (Granger, 1969).

3.7.8 Hausman Test

Hausman test or often referred to as a method used to determine the best model between a fixed effect or random effect and the result is to choose a fixed effect, then it should be continued with the Hausman test. The requirement is to perform steps in a sequence, which is doing a fixed effect analysis first and then proceed with the model of random effect. The decision is made that if the probability value (p-value) is found to be less than the significance level (0.05 for this study), then the null hypothesis (H_0) is rejected concluding the alternative (H_1) which means the best

method to be used is the fixed effect from the random effect if the null hypothesis is not rejected, then, it means the random effects model should be adopted.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter is involved in the analysis of data, its interpretation, the discussion and data presentation of the research findings. Data analysis has been performed per the research objectives where the methods used are as discussed in chapter three of this study. The methods are descriptive and inferential methods where under descriptive methods, frequencies, statistics such as means, variance, standard deviations and range were carried out and the results were presented in tables and charts. The inferential analysis involved hypothesis testing which sought to establish significant relationships between the response and the explanatory variables. Based on the panel data model, the following tests were conducted; Granger causality test, multicollinearity test, autocorrelation stationary tests and inferential statistics. Before the tests, some diagnostic tests were performed to check for the validity of the study results. The data involved is secondary, where there are financial innovations and market capitalization. Hypothetical and review of literature empirically in this investigation has been utilized to call attention to areas of understanding or conflict with the discoveries in this investigation or study. The chapter is organized as follows: data description, Diagnostic test, descriptive analysis and the research findings for the five study objectives.

4.2 Response Rate

The study utilized secondary information got for both the dependent and explanatory factors from the bank's yearly distributed fiscal summaries accessible at the NSE website and CBK quarterly reports. The information involved contained Market capitalization (MC), which was the dependent variable. Other variables were: Agency banking (AB), Internet banking (IB), Mobile Banking (MB) and Plastic credit card (PCC) which were the independent variables and finally bank ownership which was the moderating variable. The variables were transformed into natural logarithm to work with smaller figures. The information was collected over a period

of five years quarterly in the eleven banks listed in Nairobi stock exchange leading to a total number of 220 observations.

4.3 Descriptive Analysis

Descriptive statistics were performed, which comprised of mean, median, range, standard deviation, skewness, kurtosis. The results were presented in Table 4.1.

Table 4.1: Descriptive Analysis of Financial Innovations and Market Capitalization

	X_1	X_2	X_3	X_4	Y
Mean	7.158923	3.640965	9.837587	2.55887	10.67665
Median	7.073436	3.685655	9.831232	2.837894	10.60511
Standard Deviation	0.552187	0.266383	0.221107	0.596297	0.205933
Kurtosis	10.9944	-1.10111	-0.57075	-1.54407	-1.1218
Skewness	2.910852	-0.42962	0.047308	-0.25926	0.008652
Range	2.698827	0.828009	0.7682	1.677198	0.697018
Minimum	6.529718	3.132	9.435264	1.633399	10.27949
Maximum	9.228545	3.960009	10.20346	3.310596	10.97651

The results showed the mean values, median, range which contained the greatest and the smallest values, the standard deviation, skewness and kurtosis.

4.3.1 Agency Banking Financial Innovation

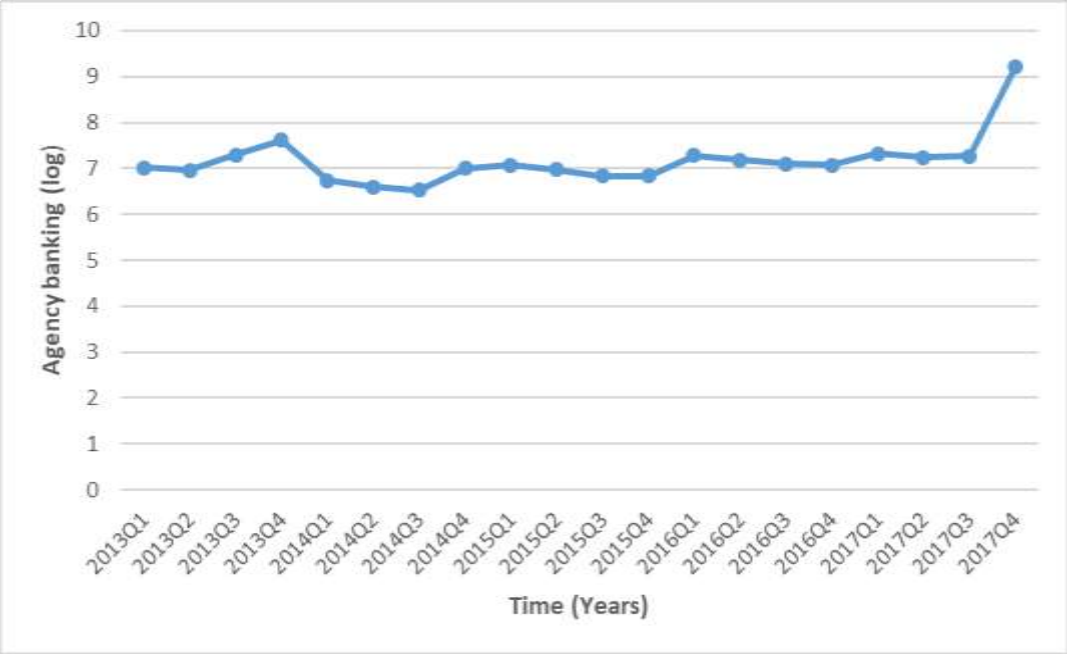

Figure 4.1: Average Quarterly Agency Banking value transactions from 2013 Q1 to 2017 Q4

The mean value transactions of Agency banking were 7.1589 and a standard deviation of 0.552187 with the lowest value being 6.5297 experienced in 2014 the third quarter. The highest occurred in the last quarter of 2017. This was after the election was over and business activities had begun to settle. The general trend was constant over the whole period.

4.3.2 Mobile Banking

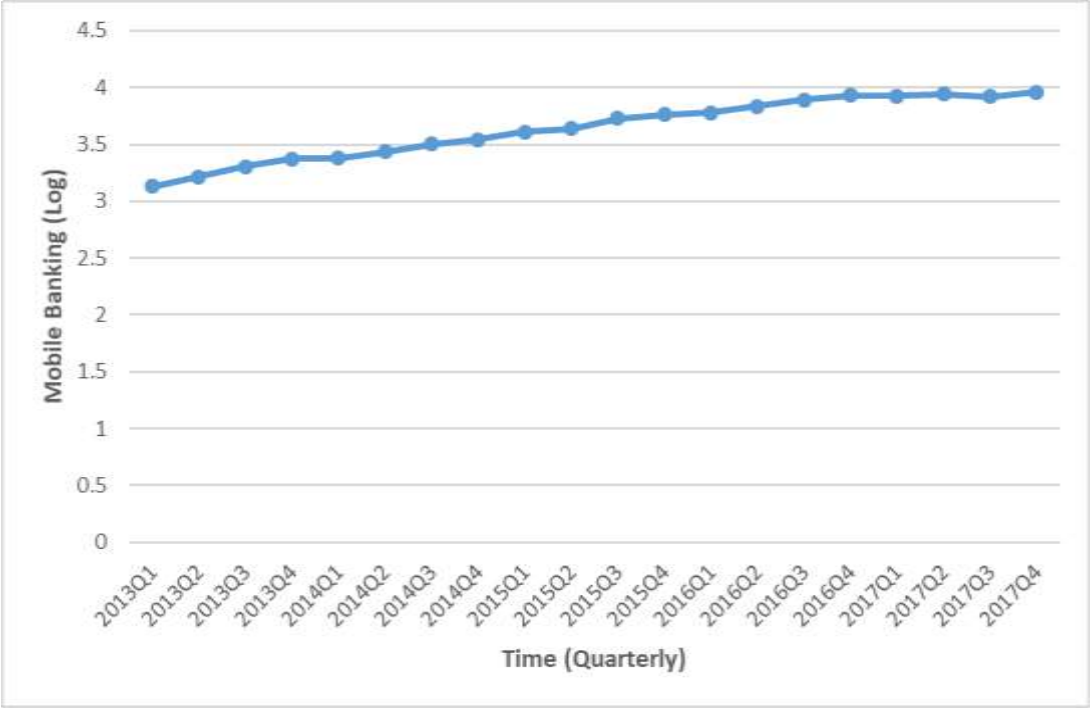

Figure 4.2: Average Quarterly Mobile Banking value transactions from 2013 Q1 to 2017 Q4

The mean value transactions of mobile banking was 3.641 and a standard deviation of 0.26638 with the lowest value being 3.132 occurring in the first quarter of 2013. The highest occurred in the first quarter of 2017 just before the 2017 elections. The results revealed a steady upward trend over the whole period. Therefore, there has been a constant growth in mobile banking over time.

4.3.3 Plastic Credit Card Innovation

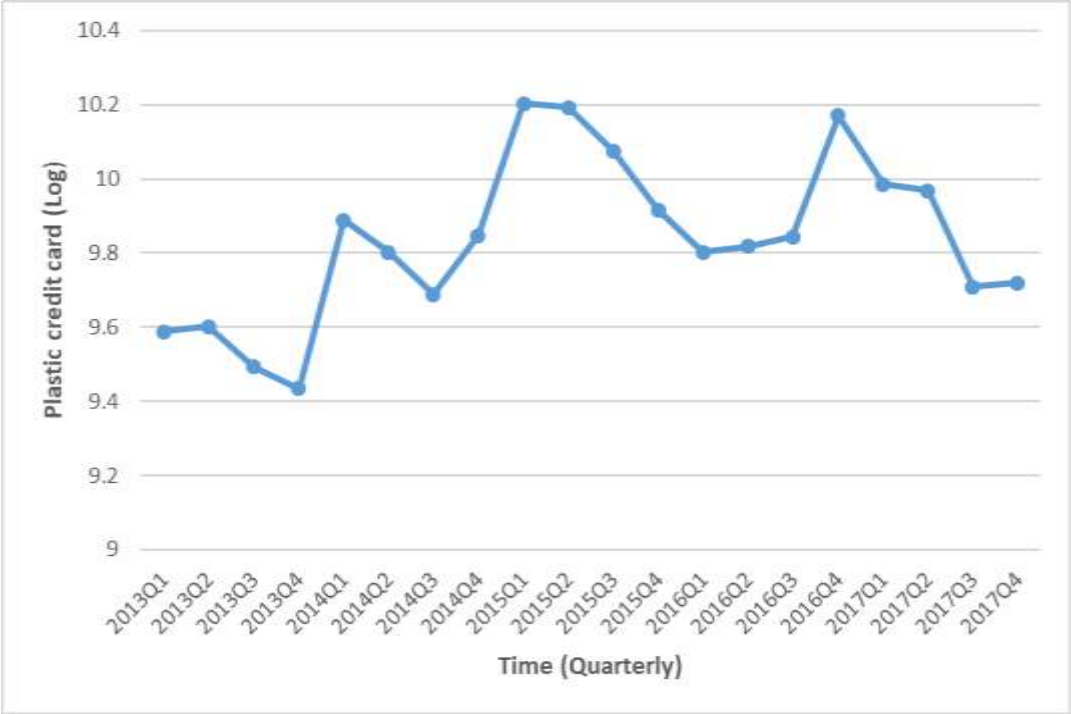

Figure 4.3: Average Quarterly Plastic Credit Card Innovation value transactions from 2013 Q1 to 2017 Q4

The mean value of the plastic credit card innovation transactions was 9.838 and a standard deviation of 0.0.2211 with the lowest value being 9.4353 occurring in the last quarter of 2013. The highest occurred in the first quarter of 2015. The results revealed a generally upward trend over the whole period. Therefore, there has been a constant growth in plastic credit card value of transactions over time.

4.3.4 Internet Banking

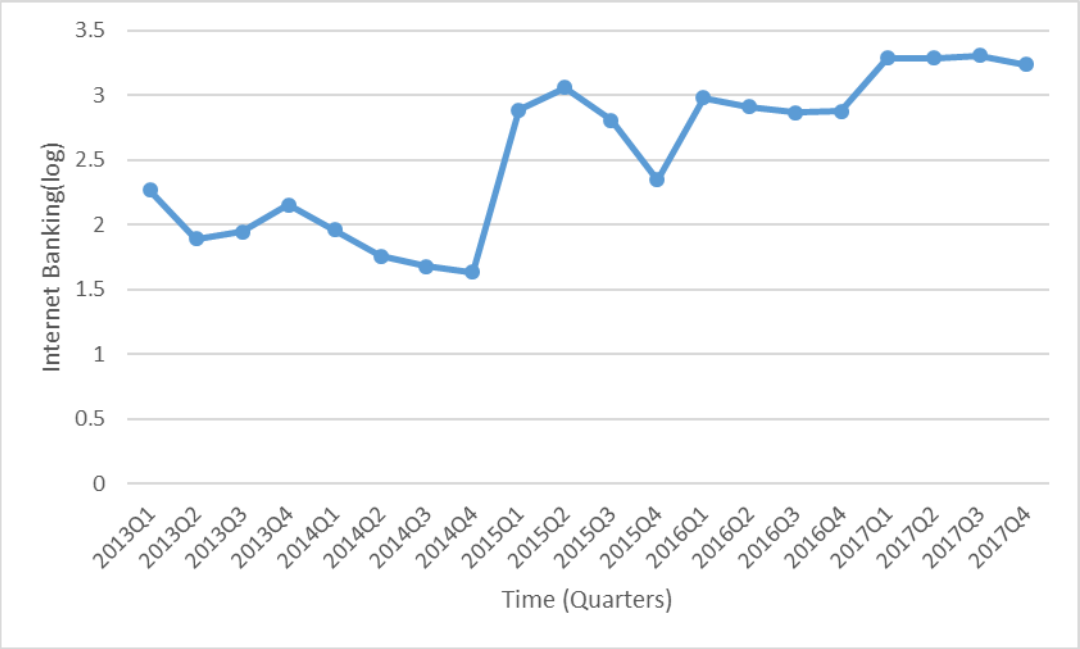

Figure 4.4: Average Quarterly Internet Banking value of transactions from 2013 Q1 to 2017 Q4

The mean value transactions of Internet banking was 2.5589 and a standard deviation of 0.0.5963 with the lowest value being 1.63339 occurring in 2014 the last quarter. The highest occurred in the first quarter of 2017 just before the 2017 elections. The results insinuated a generally upward trend over the whole period. Therefore, there has been a growth in internet banking over time.

4.3.5 Market Capitalization

Figure 4.5: Average Quarterly Market Capitalization from 2013 Q1 to 2017 Q4

Figure 4.5 shows the market capitalization trend in the 5 years. From the results, there was a downward trend in market capitalization from 2013-2016. Market Capitalization started rising from the second quarter of 2016. The mean value was 10.677 and a standard deviation of 0.205933 with the minimum being 10.27949 and a maximum of 10.97651 occurring in 2015 the second quarter.

4.4 Diagnostic tests

This section sought to do a pre-test of the data before performing any statistical test. Each is as discussed below.

4.4.1 Linearity Test

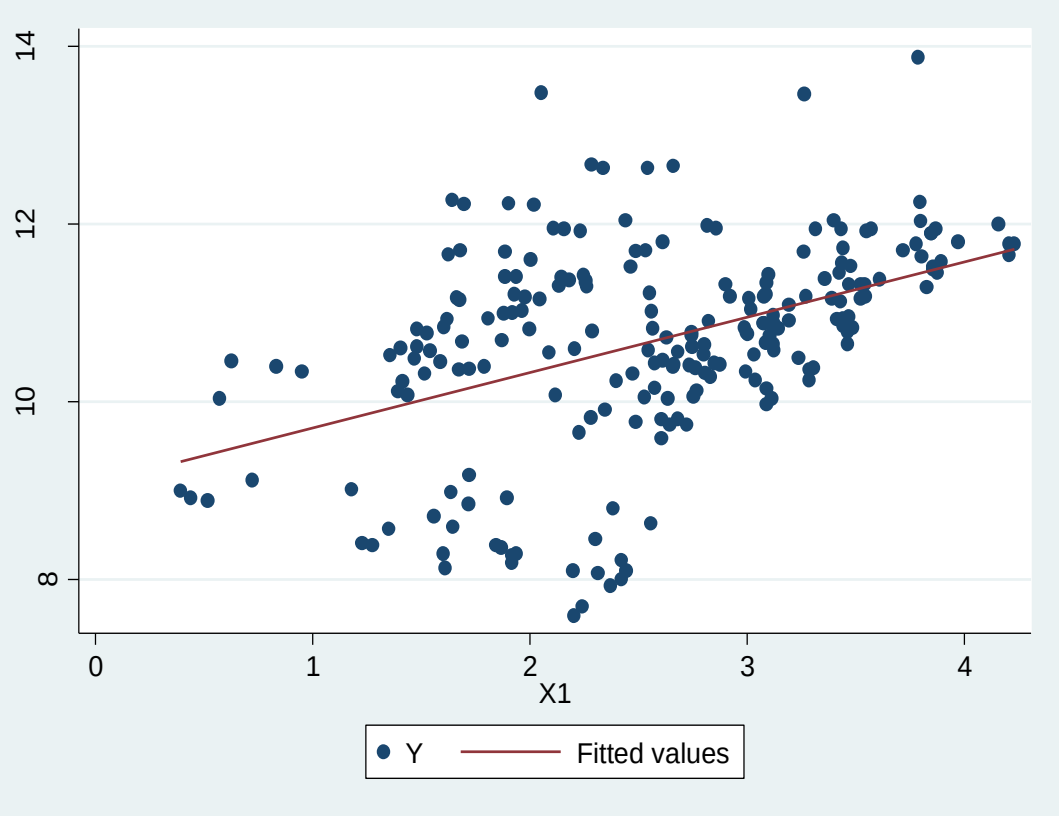

Figure 4.6: Scatter plot of Agency banking against Market Capitalization

It is clear from the scatter plot that as the value of Agency banking increases the value of Market capitalization increases therefore the assumption of the linear relation between Agency banking and Market capitalization is adhered to.

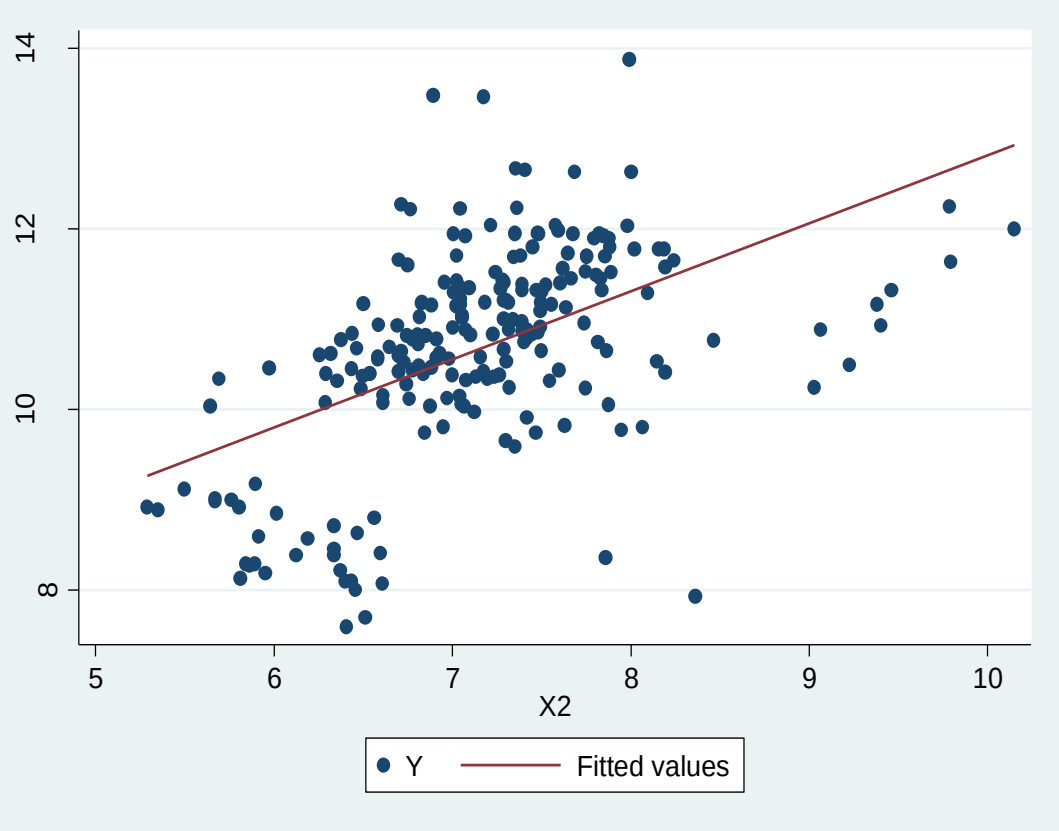

Figure 4.7: Scatter plot of X2-Mobile banking against Y-Market Capitalization

It is clear from the scatter plot that as the value of Mobile banking increases the value of Market capitalization increases; therefore, the assumption of the linear relation between Mobile banking and Market capitalization is adhered to

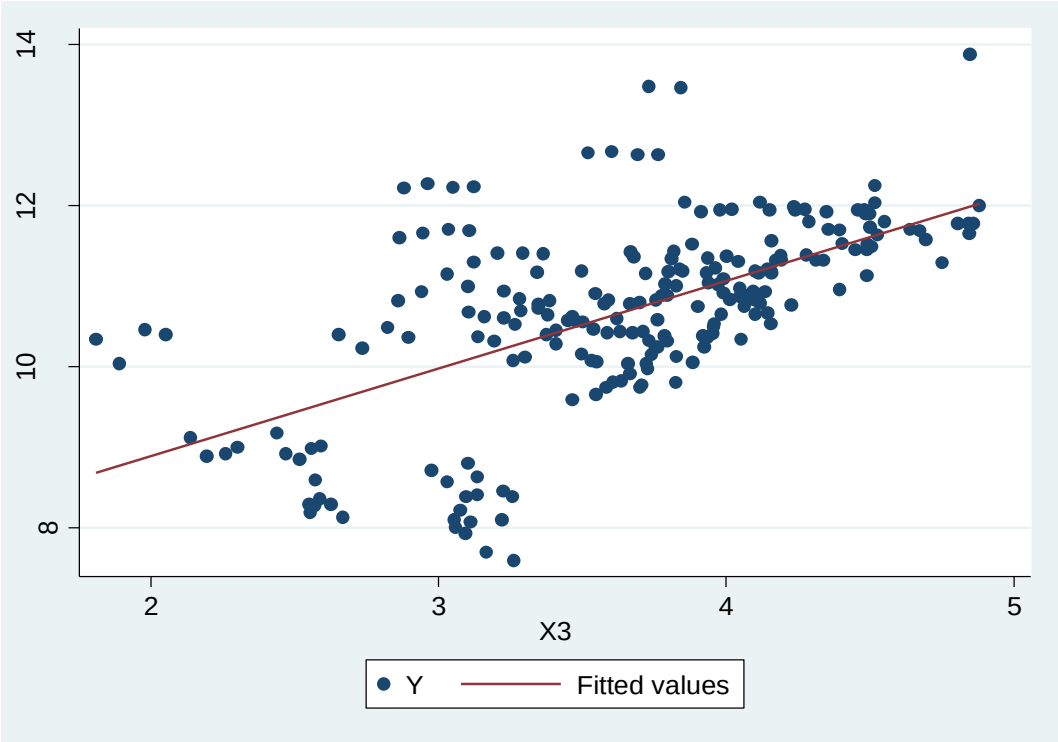

Figure 4.8: Scatter plot of X3-Plastic credit card innovations against Y-Market Capitalization

It is clear from the scatter plot that as the value of Mobile banking increases the value of Market capitalization increases; therefore, the assumption of the linear relation between Mobile banking and Market capitalization is adhered to.

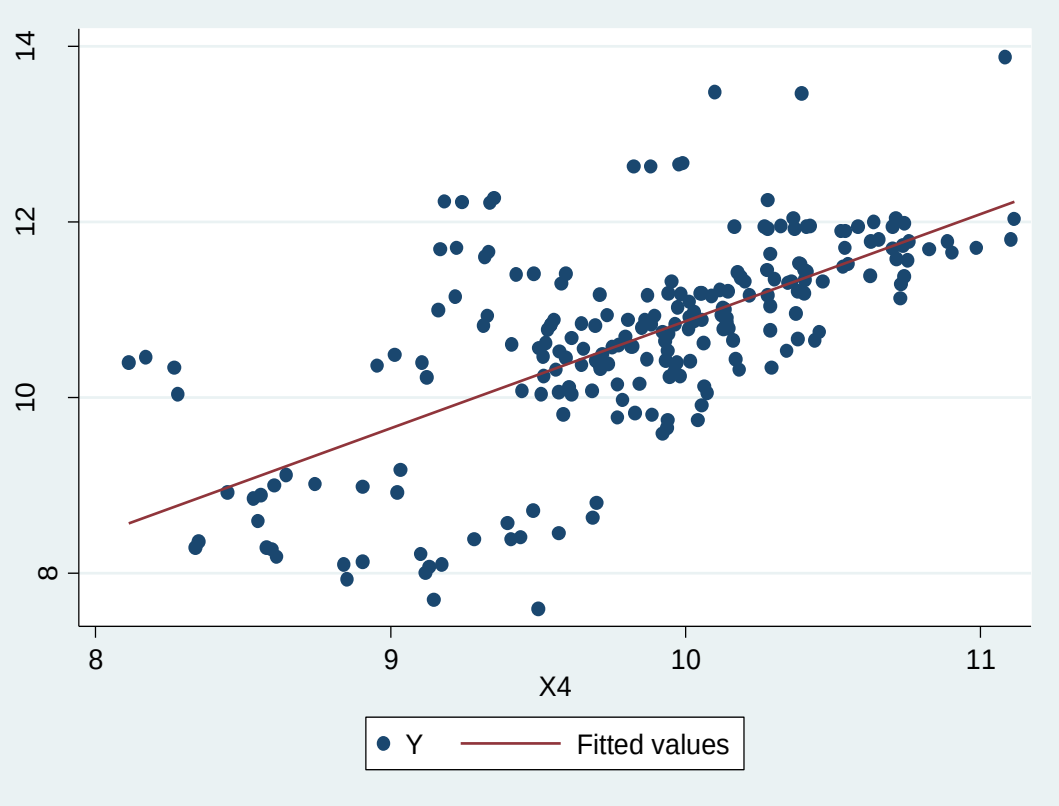

Figure 4.9: Scatter plot of X4-Internet Banking against Y-Market Capitalization

It can be seen from the scatter plot that as the value of Internet banking increases the value of Market capitalization increases; therefore the assumption of the linear relation between Internet banking and Market capitalization is adhered to.

4.4.2 Test for Multi-Collinearity

Multicollinearity is the high correlation among the predictor variables. In pooled Ordinary Least Squares (OLS) model, multicollinearity is said to exist when there is more than one exact linear relationship among the independent or predictor variables. The predictor variables are assumed not to be highly correlated with each other. Multicollinearity test lessens the factors that measure very similar things and checks model repetition. In this investigation, the Variance Inflation Factor (VIF) test was utilized to test for multicollinearity.

Table 4.2: Multicollinearity test

Variable	Tolerance	VIF
Agency Banking	.535	1.870
Mobile Banking	.322	3.108
Plastic credit card	.487	2.052
Internet Banking	.292	3.425

From Table 4.2, Variance Inflation Factors are less than 5 while Tolerance values are above 0.2. This means that the explanatory factors are not correlated highly. According to Belsley et al. (2004), a tolerance with a value above 0.2 means there is low multicollinearity, whereas a value close to 0 suggests that multicollinearity exists. On the other hand, according to Gujarati (2009), a VIF of more than 10 indicates a problem of multicollinearity. Therefore, there was no multi-collinearity.

4.4.3 Autocorrelation

Autocorrelation alludes to the relationship, not between two (at least two) distinct factors, but between the progressive estimations of a similar variable. It is a numerical portrayal of the level of closeness between a given time arrangement and a lagged rendition of itself over progressive time intervals. Autocorrelation was tested using the Durbin-Watson (D-W) statistical test. Gujarat (2009) stated that if the Durbin-Watson value is under 1.0 or more prominent than 3.0, at that point, there might be cause for concern. The D-W statistic is considered best if it is closer to 2. In this study, the Durbin Watson (D-W) statistic of 1.992 was obtained, and this was within the acceptable limits (Gujarat, 2009).

4.4.4 Stationarity test

A Stationarity test was conducted in the study to determine the time series of statistical features found in the data used in this study. The main objective of this test was to ensure that the data was stationary. A stationary time series data is one that

exhibits near the constant mean, variance and autocorrelation. Stationarity was examined by performing a unit root test. A unit root is an element of procedures that develops through time that can cause issues in measurable deduction, including time series models. These tests were: Augmented Dickey-Fuller test (ADF), Levin, Lin and Chu and Im, Pesaran and Shin W tests.

The hypotheses of the tests are as follows:

H_0: There is a presence of a unit root in the data

H_1: Unit root is absent in the data i.e. the data is stationary.

A decision is made that if the test statistic is significant (probability (p) value is less than the significant level, 0.05 in this study), then there is a rejection of the null hypothesis, and conclusion of the alternative hypothesis. Otherwise, fail to reject the null hypothesis and assume the data contains a unit root and therefore not stationary. Findings are presented in Table 4.3 below.

Table 4.3: Stationarity test

Variable	**Levin, Lin and Chu Test**	**Im, Pesaran and Shin W Test**	**ADF test**	**Integration order**
	t-statistic	t-statistic	t-statistic	
Market capitalization	-19.306**	-7.285**	70.318**	I(0)
Agency Banking	-10.930**	-9.545**	61.147**	I(0)
Internet Banking	-2.365**	-2.352**	30.641**	I(0)
Mobile Banking	-3.791**	-3.654**	37.052**	I(0)
Plastic card Innovation	-7.445**	-2.540**	35.492**	I(0)

As showed in Table 4.3 over, the null hypothesis was not rejected for every one of the factors in the tests: Philips Perron Fisher (PP) test, Im, Pesaran, Dickey-Fuller (ADF) test and Shin W-stat. In this way, it was presumed that the factors were stationary in level and integrated of order zero (I(0)).

4.4.5 Granger Causality

Granger Causality tests are performed to investigate the short-run causal relationship among the variables. The Granger causality test is a statistical hypothesis test for determining whether a one-time series is useful for forecasting another. The study variables were subjected to Granger Causality tests with a lag of two which was used to investigate the causal relationship between the financial innovations namely: Agency Banking, Mobile Banking, Plastic credit card and Internet Banking and Market capitalization. This study carried out Granger Causality Test using E-Views to test the causal relationship,. The results of the data are presented in Table 4.4.

Table 4.4: Granger Causality

Cause Variable	Response variable	Null hypothesis	F-Statistic	P-value	Interpretation
Agency Banking	Internet Banking	AB do not granger cause IB	31.7237	0.000	Causation
	Mobile Banking	AB do not granger cause MB	553.369	0.000	Causation
	Plastic credit card	AB do not granger cause PCC	546.487	0.000	Causation
	Market capitalization	AB do not granger cause MC	5.58544	0.0091	Causation
Internet Banking	Agency Banking	IB do not granger cause AB	554.495	0.000	Causation
	Mobile Banking	IB do not granger cause MB	21.6228	0.001	Causation
	Plastic credit card	IB do not granger cause PCC	271.145	0.000	Causation
	Market capitalization	IB do not granger cause MC	4.18609	0.0257	Causation
Mobile Banking	Agency Banking	MB do not granger cause AB	553.369	0.000	Causation
	Internet Banking	MB do not granger cause IB	21.6228	0.001	Causation
	Plastic credit card	MB do not granger cause PCC	274.203	0.000	Causation
	Market capitalization	MB do not granger cause MC	4.69525	0.0174	Causation
Plastic credit card	Agency Banking	PCC do not granger cause AB	546.487	0.000	Causation
	Internet Banking	PCC do not granger cause IB	31.7351	0.000	Causation
	Mobile Banking	PCC do not granger cause MB	21.7363	0.000	Causation
	Market capitalization	PCC do not granger cause MC	1.38334	0.0267	Causation

From the table above, at 95% levels of confidence, the study finds that Agency banking, Internet banking, Mobile banking and Plastic credit card financial innovations granger causes market capitalization.

4.5 Inferential statistics

4.5.1 Pooled OLS model estimates

The (pooled) OLS is a pooled linear regression without fixed and/or random effects. It assumes a constant intercept and slopes regardless of group and time. In the sample panel data with five airlines and 15 time periods, the basic scheme is that total cost is determined by output, fuel price, and loading factor. The pooled OLS posits no difference in intercept and slopes across banks and time.

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

The results in Table 4.6 depict the summary of the pooled OLS model. The panels were shown to be strongly balanced in the 11 listed commercial banks. The panel data was strongly balanced as the lowest, average and highest number of observations per groups was all equal to 20. The coefficient of determination value (R-square) was found to be 0.4811. The coefficient of determination (R^2) generally shows the change of the dependent variable, market capitalization in this study that is explained by the change of the independent (financial innovations). R^2 within is the measure of the goodness of fit for the distinct mean de-trended data which ignores all the evidence between groups. The model was found to significantly predict the dependent variable (F (4, 215) =49.83, p = 0.000).

Table 4.5: Pooled OLS model estimates

Source	**SS**	**df**	**MS**		**Number of obs**	**220**
					F(4, 215)	49.83
Model	140.8685	4	35.2171223		Prob > F	0.000
Residual	151.9449	215	.706720498		R-squared	0.4811
					Adj R-squared	0.4714
Total	292.8134	219	1.33704747		Root MSE	0.84067
Y	Coef.	Std. Err.	T	P>t	95% C.I	95% C.I
					Lower Limit	Upper Limit
X_1	0.4403	.1483	2.97	0.003	-0.732	0.148
X_2	0.5087	.120	4.23	0.000	0.272	0.745
X_3	0.2973	.362	0.82	0.412	-1.011	0.415
X_4	1.5468	.267	5.80	0.000	1.021	2.072
_cons	5.9731	1.946	3.07	0.002	-9.809	2.137

Table 4.5 presents the model coefficients from the pooled OLS regression model fitted.

The coefficients of the explanatory variables Agency banking, Mobile banking and Internet banking were found to be significant. The beta coefficients for Agency banking, Mobile banking and Internet banking were found to be 0.4403, 0.5087 and1.546 respectively. The p-values of the t-statistics for the coefficients estimated were found to be 0.003, 0.000 and 0.000, respectively. The coefficient of Plastic Card innovation was 0.29736. In contrast, the p-value for Plastic credit card innovation was 0.412>0.05 level of significance indicating that the variable was not a significant predictor of Market Capitalization according to pooled OLS model.

Although this model fits the data well, we know that each bank and year have different initial Market Capitalization. That is, each bank has different Market Capitalization, Y-intercept that is significantly different from those of other banks. It is also possible that the error terms vary across banks and/or years (quarters). It is imperative to check fixed effects through a fixed-effects model as well as random effects using the random-effects model.

4.5.2 Fixed Effect Model

A fixed group model examines group differences in intercepts. The least-squares dummy variable (LSDV) regression is ordinary least squares (OLS) with dummy variables. The LSDV for this fixed model needs to create as many dummy variables as the number of entities or subjects. Let us here examine fixed group effects by introducing group (Bank) dummy variables. The dummy variable b1 is set to 1 for Bank 1 and zero for other Banks; similarly, the variable b2 is coded as 1 for Bank 2 and zero for other Banks companies; and so on for the other dummy variables. The dummy variables and regressors are allowed to be correlated in a fixed-effect model. $\mu_1, \ldots, \mu_{10}$ are respectively, parameter estimates of group dummy variables *b1-b10*.

LSVD equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_1 b1 + \mu_1 b1 + \mu_2 b2 + \cdots + \mu_{10} b10 + \varepsilon$$

Table 4.6: Fixed Effects model estimates

Source	**SS**	**df**	**(MS)**		**Number of obs**	**220**
					F(14, 205)	32.65
Model	202.14	14	14.43		Prob > F	0.000
Residual	90.66	205	.442		R-squared	0.6903
					Adj R-squared	0.669
Total	292.81	219	1.337		Root MSE	0.665
Y	**Coef.**	**Std. Err.**	**T**	**P>t**	**Lower 95% C. I**	**Upper 95% C. I**
b1	3.067	.610	5.02	0.000	1.863	4.271
b2	2.442	.521	4.69	0.000	1.415	3.469
b3	2.958	.524	5.64	0.000	1.926	3.992
b4	2.765	.459	6.02	0.000	1.860	3.671
b5	2.300	.390	5.90	0.000	1.531	3.069
b6	2.316	.452	5.11	0.000	1.423	3.209
b7	1.929	.382	5.05	0.000	1.176	2.682
b8	2.046	.342	5.97	0.000	1.371	2.721
b9	1.484	.346	4.29	0.000	0.802	2.167
b10	0.196	.278	0.71	0.482	0.745	0.352
X_1	0.0219	.136	0.16	0.873	0.291	0.247
X_2	0.1856	.109	1.70	0.091	0.029	0.401
X_3	0.8298	.299	2.77	0.006	1.421	0.238
X_4	0.4644	.278	1.67	0.096	0.084	1.012
_cons	5.936	2.494	2.38	0.018	1.019	10.854

This LSDV fits the data better than does the pooled OLS in Table 4.6, and the R-square increased from 0.4811 to 0.6903. Due to the dummies included, this model loses 15 degrees of freedom (from 220 to 205). Parameter estimates of individual regressors are slightly different from those in the pooled OLS. For instance, the coefficient of Agency Banking decreased from 0.44032 to 0.022, but its statistical significance also changed where it is non-significant this model. At the same time, Plastic credit card is significant p-value=0.006<0.05 is significant in this model but was non-significant in the Pooled OLS model.

Testing a Fixed Effect (F-test)

To establish whether the model had a significant fixed group effect, F-test was conducted after fitting the Least Square Dummy Variable Model (LSDV). The null hypothesis of this F-test is that all dummy parameters except for one are zero:

(1) b1 = 0

(2) b2 = 0

(3) b3 = 0

(4) b4 = 0

(5) b5 = 0

(6) b6 = 0

(7) b7 = 0

(8) b8 = 0

(9) b9 = 0

(10) b10 = 0

Test result; was F (10, 205) = 13.85, with Prob >F=0.000. Since significance value is 0.000<0.5 level of significance, we reject the null hypothesis and conclude that there is difference in intercepts. Therefore, model of no fixed effects is the most appropriate.

4.5.3 Random Effects Model

A random-effect model examines how the group and/or time influence error variances. This section discusses the feasible generalized least squares (FGLS) and various estimation methods available in Stata. To get θ for FGLS, we need "between" estimation first. Random effects model, unlike the fixed effects model, the variation across entities are assumed to be random and uncorrelated with the predictor or independent variables included in the model. This model is used when the differences across entities are believed to have some influence on the dependent variable. The model assumes that the entity's error term is not correlated with the predictors which allow for time-invariant variables to play a role as explanatory variables. Table 4.7 shows results for the Random-effects GLS regression.

Table 4.7: Random Effects Model

R-sq: within = 0.0300					**Number of obs = 220**	
between = 0.7684					Number of groups = 11	
overall = 0.4609					Obs per group: min = 20	
					Avg = 20.0	
					Max = 20	
					Waldchi2(4)= 21.87	
corr(u_i, X) = 0 (assumed)					Prob>chi2= 0.0115	
Y	**Coef**	**Std. Err.**	**z**	**p>|t|**	**Lower 95% C. I**	**Upper 95% C. I**
X_1	0.14379	0.140158	-1.03	0.305	-0.4185	0.130913
X_2	0.279767	0.111955	2.5	0.012	0.060339	0.499195
X_3	0.67478	0.301876	-2.24	0.025	-1.26645	-0.08311
X_4	0.77968	0.290069	2.69	0.007	0.211155	1.348205
_cons	3.828442	2.988048	1.28	0.2	-2.02802	9.684909
/sigma_u	0.81332	0.22786			0.469665	1.408428
/sigma_e	0.663121				0.032956	

From the results in Table 4.7, the coefficient of determination values (R-square) within, between and the overall were found to be 0.0300, 0.7684 and 0.4609 respectively. The coefficient of determination (R-square) generally shows the change of the dependent variable that is explained by the change of the independent. R-square within is the measure of the goodness of fit for the distinct mean de-trended data which ignores all the evidence between groups. The p-value of the F-test was found to be 0.0115. This is a test to see whether all the coefficients in the model are different from zero. Since the p-value was less than 0.05, then the coefficient of the model with Market capitalization as the dependent variable was significantly different from zero and therefore, the model was okay. The findings showed that

Mobile Banking, Plastic credit card innovations and Internet banking significantly influenced Market capitalization at 0.05 level of significance as indicated by significant p-values (0.012, 0.025and 0.007 respectively) while Agency banking was found to be non-significant at 0.05 level of significance with a p-value of 0.305.

Testing a Random Effect: LM test

The Breusch-Pagan Lagrange multiplier (LM) test examines if any random effect exists. The null hypothesis is that individual-specific or time-specific error variance components are zero: H_0=Variance=0. If the null hypothesis is not rejected, the pooled OLS is preferred; otherwise, the random effect model is better.

Table 4.8: Breusch and Pagan Lagrangian multiplier test for random effects

Breusch and Pagan Lagrangian multiplier test for random effects
Y[Bank,t] = Xb + u[Bank] + e[Bank,t]
Estimated results:
| Var sd = sqrt(Var)
Y | 1.337047 1.156308
e | .4422915 .66505
u | .2303958 .4799956
Test: Var(u) = 0
chibar2(01) = 153.62
Prob > chibar2 = 0.0000

With the large chi-squared of 153.62, we reject the null hypothesis in favour of the random group effect model (p <.0000).

4.5.4 Random Effect Model or Fixed Effect Model - Hausman Test

A multiple panel data regression model was adopted and used. The study fitted the two models known as the fixed-effect and random-effect. Hausman test, which examines the correlation effect between errors and regressors, was used to find the most appropriate model to adopt. The Hypothesis is stated as follows:

Null hypothesis (H_0): Random-effects model is appropriate

Alternative hypothesis (H_1): Fixed effects model is appropriate

In decision making, the null hypothesis is rejected if the probability value is less than 5%, while the null hypothesis (H_0) is not rejected if the probability value is greater than 5%. The results were then shown in Table 4.10 as presented below.

Table 4.9: Hausman Test

	Coefficients			
	Fixed-group	**Random-group**	**Difference**	**S.E.**
X1	0.0219	0.1437	-0.1218	.0314
X2	0.1856	0.2797	-0.0941	.02415
X3	0.8298	0.6747	0.1551	.0353
X4	0.4644	0.7796	-0.3152	.0829
	Chi-square value=17.82	Prob>chi2 =0.081		

From Table 4.9, it was found that the Chi-Square statistic for the test was 17.82with a significant p-value of 0.081 compared to a significance level (α= 0.05). The p-value=0.081>0.05; therefore, the null hypothesis was not rejected; we conclude that the random-effects model is better than its fixed counterpart. This implies that the

random-effects model is more satisfactory than the fixed effects model and was therefore adopted in hypothesis testing.

4.6 Hypothesis Testing

Hypothesis 1: Agency banking has no significant effect on the market capitalization of Listed commercial banks in Kenya

Table 4.10: Coefficients for Agency Banking model

Random-effects GLS regression				**Number of obs** =	**220**
Group variable: Bank				Number of groups =	11
R-sq: within = 0.0203				Obs per group: min =	20
between = 0.7684				avg =	20.0
overall = 0.1948				max =	20
				Wald chi2(1) =	0.19
corr(u_i, X) = 0 (assumed)				Prob > chi2 =	0.6648

Y	**Coef.**	**Std. Err.**	**Z**	**P>z**	**Lower 95% C.I**	**Upper 95% C.I**
X_1	0.03455	0.079756	0.43	0.665	-0.19087	0.121765
_cons	10.76507	0.260915	41.26 0.000	0.000	10.25368	11.27645
sigma_u	0.479346					
sigma_e	0.67436					
rho	0.335662		(fraction of variance due to u_i)			

The null hypothesis: Agency banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that: Agency banking had no significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=0.43, p-value=0.665>0.05). Therefore at a 5% significance level, the null hypothesis was not rejected. It was noted that though the variable was not significant for every unit increase in Agency banking, there was a corresponding increase in market capitalization by 0.035 units.

Hypothesis 2: Mobile banking has no significant effect on the market capitalization of listed commercial banks in Kenya

Table 4.11: Coefficients for Mobile banking model

Random-effects GLS regression	**Number of obs = 220**
Group variable: Bank	Number of groups = 11
R-sq: within = 0.0001	Obs per group: min = 20
between = 0.7684	avg = 20.0
overall = 0.2648	max = 20
	Wald chi2(1) = 2.00
corr(u_i, X) = 0 (assumed)	Prob > chi2 = 0.1570

Y	**Coef.**	**Std. Err.**	**z**	**P>z**	**Lower 95% C.I**	**Upper 95% C.I**
X2	0.120512	0.085144	1.42	0.157	-0.0463675	0.2873904
_cons	9.813918	0.630316	15.57	0	8.578522	11.04931
sigma_u	0.478858					
sigma_e	0.681274					
rho	0.330677	(fraction of variance due to u_i)				

The null hypothesis: Mobile banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that: Mobile banking has no significant effect on the market capitalization of listed commercial banks in Kenya since (z-statistic=1.42, p-

value=0.157>0.05). Therefore at a 5% significance level, the null hypothesis was not rejected. However, it was noted that for every unit increase in Mobile banking, there was a corresponding increase in market capitalization by 0.121 units.

These outcomes were likewise affirmed by past literature. To be exact, studies done by Bagudu et al. (2017), Kathuo (2015), Shirley and Sushanta (2006), Mabrouk and Mamoghli (2010) on the correlation between financial innovations and bank financial performance found out that Mobile banking financial innovations have a significant positive effect on firm performance. However, Abongo (2016) and Waweru (2012) found a significant negative effect of mobile banking innovations on bank performance negating the findings of this study.

Hypothesis 3: Plastic credit card innovations have no significant effect on the market capitalization of listed commercial banks in Kenya

Table 4.12: Coefficients for Plastic credit card innovations model

Random-effects ML regression					**Number of obs** =	**220**
Group variable: Bank					Number of groups =	11
Random effects u_i ~ Gaussian					Obs per group: min =	20
					avg =	20.0
					max =	20
					LR chi2(1) =	4.42
Log likelihood = -245.10292					Prob > chi2 =	0.0354
Y	**Coef.**	**Std. Err.**	**z**	**P>z**	**Lower 95% C.I**	**Upper 95% C.I**
X_3						
	0.3628304	0.17	2.14	0.032	-0.6953067	0.030354
_cons	11.9977	0.705	17.01	0	10.61511	13.3803
sigma_u	1.12045	0.259			0.7121988	1.762721
sigma_e	0.6662034	0.033			0.6050994	0.7334778
rho	0.7388078	0.092			0.5343302	0.8836023

The null hypothesis: Plastic credit card innovations have no significant effect on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that: Plastic credit card innovations had a significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=-2.14, p-value=0.032<0.05). Therefore at a 5% significance level, the null hypothesis was rejected. It was noted that for every unit increase in Plastic credit card innovations, there was a corresponding increase in market capitalization by 0.362 units.

In agreement with the findings of this study, Kyalo (2012) did research on the link between credit card financial innovation and performance of Kenyan commercial banks. The study objectives were to determine whether credit cards adoption improves or decrease Bank performance in Kenya. The adoption of Credit card innovation was measured by the credit cards numbers issued out by the Banks during the period, whereas the return on assets was used as the measure of performance. The researcher used casual research design and Secondary data was obtained from 7 commercial banks for a period of 5 years from 2009 to 2013. Multiple linear regression and OLS regression methods were conducted on the data obtained. The study determined that credit card innovation has a significant and positive effect on the performance of Kenyan commercial banks.

This was supported by Kamal (2012) whom in an empirical study to establish the effect of electronic credit cards on Bank's Performance in Jordan. Credit card usage measured as the proportion of investment and operation expenses related to credit cards and bank performance measured in terms of credit cards net income found out that credit card usage had a significant positive effect on the bank performance.

Hypothesis 4: Internet banking has no significant effect on the market capitalization of listed commercial banks in Kenya

Table 4.13: Coefficients for Internet banking model

Random-effects GLS regression					**Number of obs**	= **220**
Group variable: Bank					Number of groups	= 11
R-sq: within	= 0.0043				Obs per group: min	= 20
between	= 0.7684				avg	= 20.0
overall	= 0.4238				max	= 20
					Wald chi2(1)	= 5.70
corr(u_i, X)	= 0 (assumed)				Prob > chi2	= 0.0170
Y	**Coef.**	**Std. Err.**	**z**	**P>z**	**Lower 95% C.I**	**Upper 95% C.I**
X_4	0.3990	0.167203	2.39	0.017	0.0713	0.7267
_cons	6.7506	1.65258	4.08	0.000	3.5116	9.9896
sigma_u	0.4789					
sigma_e	0.6798					
Rho	0.3316	(fraction of variance due to u_i)				

The null hypothesis: Internet banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that Internet banking had a significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=2.39, p-value=0.017<0.05). Therefore at 5% significance level, the null hypothesis was not rejected, therefore for every unit increase in Internet banking; there was a corresponding increase in market capitalization by 0.399 units.

These results agreed to the findings by DeYoung (2007), Jayakumar (2012), Njenga, Kiragu and Opiyo (2014), Ngari, et al. (2015) and Agboola (2007) whom in studies on the effect of financial innovations on bank performance found out a significant positive effect of electronic or internet banking financial innovation on bank

performance. On the contrary, researches by Malhotra and Singh (2009) revealed an insignificant effect of electronic financial innovations on firm performance.

Hypothesis 5: Bank Ownership has no moderating effect on the relationship between Financial innovations and Market Capitalization of Listed Commercial Banks in Kenya

This section analyses the moderating effect of bank ownership on the effect of financial innovations on the market capitalization of listed commercial banks in Kenya. Moderation determines whether a moderator variable influences the strength and the extent of the direction of the relationship between a dependent and independent variable. The effect is determined by a significant coefficient of an interaction term.

A moderated random-effects model was performed with a Market capitalization of listed banks in the Nairobi stock exchange in Kenya being the dependent variable and financial innovations namely Agency Banking, Mobile Banking, Plastic credit card and Internet Banking as the independent variables. Bank ownership was taken to be the moderating variable. The model coefficient in Table 4.14 shows the significance of the interaction terms and provides essential information about the difference the groups of the moderator in its relationship between the dependent and the independent variables.

Table 4.14: Moderated Random Effects Correlation Coefficients

Random-effects GLS regression				**Number of obs**	=	**220**
Group variable: Bank				Number of groups	=	11
R-sq: within = 0.0643				Obs per group: min	=	20
Between = 0.7504				Avg	=	20
Overall = 0.5103				Max	=	20
				Wald chi2(9)	=	36.07
corr(u_i, X) = 0 (assumed)				Prob > chi2	=	0

Y	**Coef.**	**Std. Err.**	**z**	**P>|z|**	**Lower 95% C. I**	**Upper 95% C.I**
X_5						
1="Foreign"	14.50466	5.938082	2.44	0.015	2.866234	26.14309
X_1	0.3113	0.149512	2.08	0.037	-0.60434	-0.01826
X_1*X_5						
1="Foreign"	0.491156	0.302273	1.62	0.104	-0.10129	1.083599
X_2	0.384296	0.12072	3.18	0.001	0.14769	0.620902
X_2*X_5						
1="Foreign"	0.27107	0.240593	1.13	0.260	-0.74262	0.200487
X_3	0.31701	0.349164	0.91	0.364	-1.00136	0.367337
X_3*X_5						
1="Foreign"	1.02035	0.669543	1.52	0.128	-2.33263	0.291933
X_4	1.099782	0.284104	3.87	0.000	0.54295	1.656615
X_4*X_5						
1="Foreign"	0.94695	0.616839	1.54	0.125	-2.15594	0.26203
_cons	1.08383	2.522047	0.43	0.667	-6.02695	3.859296
sigma_u	0.500629					
sigma_e	0.664497					
rho	0.362083	(fraction of variance due to u_i)				

Where X_5 is the variable representing Bank ownership code 0= Local, 1= Foreign.

Where Y is the market capitalization, X_1 is Agency banking, X_2 is Mobile banking, X_3 is Plastic credit card innovations while X_4 is Internet Banking. X_1*X_5 is the moderated Agency banking, X_2*X_5 is the moderated Mobile banking, X_3*X_5 is the moderated Plastic credit card innovations and X_4*X_5 is moderated Internet Banking.

$$Y = 1.084 + 0.491X_1*X_5 + 0.271X_2*X_5 + 1.020X_3*X_5 + 0.947X_4*X_5$$

Interaction of Bank ownership and Agency Baking was not significant since the p-value=0.104>0.05 level of significance, Interaction of Bank ownership and Mobile Baking was not significant since the p-value=0.260>0.05 level of significance, the interaction between Bank ownership and Plastic credit card innovations was not significant since the p-value=0.128>0.05 level of significance, the interaction term between Bank ownership and Internet Banking was not significant since the p-value=0.125>0.05 level of significance. Therefore, the hypothesis of no moderating effect was not rejected, concluding that bank ownership has no moderating effect on the market capitalization of listed commercial banks in Kenya.

These findings agree with results by Kamau (2009) and Ilduara and Evis (2014), who concluded that Bank ownership has an insignificant negative effect on firm performance. This indicates that bank ownership does not have a moderating effect on the relationship between financial innovations and market value or capitalization.

On the contrary, studies by Kiruri (2013); Flamini *et al.* (2009) and Dagnachew, (2017) revealed that bank ownership structure determines firm performance. Again, in a study by Kamau (2009) of identifying the determinants of efficiency and productivity of the banking industry in Kenya, found out that that foreign-owned

banks affect the performance of the local banking sector. He further claimed that overseas banks generally bring with them superior skills and knowledge capacity. Foreign banks impose competitive pressure on domestic banks. They get liquidity resources from their country of origin banks because of their accessibility to international markets. Again Dagnachew (2017) citing Claessens and Jansen (2005), indicated that overseas-owned banks usually provide better expertise and technical capacity, this then overflows to the other banking system. They force competitive thrust on local banks, therefore expanding the efficiency of financial intermediation and they offer additional steadiness to the financial system because they are capable of drawing on liquidity resources from their parent's banks and permit to enter international markets. However, the results showed that there was no effect of bank ownership on the relationship between financial innovations and market capitalization.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter summarizes the study findings, makes conclusions, gives recommendations and finally suggests areas of further research. They have been discussed per objective.

5.2 Summary of Findings

The overall objective of this study was to determine the effect of financial innovation on Market capitalization of listed commercial banks in Kenya. In particular, the study sought to determine the effect of Agency banking, Mobile banking, Plastic credit card and Internet banking financial innovations on the market capitalization of listed commercial banks in Kenya.

The study also established the moderating effect of bank ownership on the relationship between these financial innovation types and market capitalization. They were established after realizing a research gap through the literature review that the innovations variables studied in most of the articles were not comprehensive, for example, agency, Plastic credit card innovations, were left out in most of the studies on how they affected market capitalization. The researcher's main objective was to establish the effect of financial innovation on the market capitalization of listed commercial banks in Kenya.

Both descriptive and inferential analyses were carried out on the secondary data obtained and used in this research. The descriptive method involved frequency and percentages, mean and standard deviation. Under the inferential analysis procedure, Pearson's correlation, panel data analysis procedures were used to examine significance, strength and direction of relationships amid financial innovations which were the explanatory variables and market capitalization of the Kenyan listed commercial banks in the Kenyan stock exchange market. Diagnostic tests were also performed to validate the research findings. They included: normality test of

residuals, linearity, homogeneity of variance (homoscedasticity) and multicollinearity. They were all met and therefore validated the research findings. Statistical packages, namely: EVIEWS and SPSS were used in data analysis.

Specific Objective 1: Determine the effect of Agency Banking on Market Capitalization of Listed Commercial Banks in Kenya.

The study established that Agency banking had no significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=0.43, p-value=0.665>0.05). Therefore at a 5% significance level, the null hypothesis was not rejected. It was noted that though the variable was not significant, for every unit increase in Agency banking, there was a corresponding increase in market capitalization by 0.035 units. This means that Agency Banking and Mobile Banking had a positive effect on Market Capitalization, though not statistically significant. Therefore, the null hypothesis was accepted, concluding that agency banking was not a crucial factor in explaining market capitalization.

Specific Objective 2: Establish the effect of mobile banking innovation on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that: Mobile banking has no significant effect on the market capitalization of listed commercial banks in Kenya since (z-statistic=1.42, p-value=0.157>0.05). Therefore at a 5% significance level, the null hypothesis was not rejected. However, it was noted that for every unit increase in Mobile banking, there was a corresponding increase in market capitalization by 0.121 units**.** Therefore, the findings reveal that there is enough proof to accept the hypothesis and conclude that mobile banking has no significant effect on market capitalization of banks listed in the Kenyan stock exchange market.

Specific Objective 3: Establish the effect of plastic credit card innovation on the market capitalization of listed commercial banks in Kenya.

The third objective was to establish the influence of Plastic credit card innovations on the market capitalization of the Kenyan listed commercial banks. The researcher

found that there was a statistically positive and significant relationship between Plastic credit card innovation and Market capitalization of listed commercial banks in Kenya. The study findings revealed that Plastic credit card innovations had a significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=-2.14, p-value=0.032<0.05). Therefore at 5% significance level, the null hypothesis was rejected. It was noted that for every unit increase in Plastic credit card innovations, there was a corresponding increase in market capitalization by 0.362 units. Therefore, the findings reveal that there is enough proof to reject the hypothesis and concluding that plastic card innovation has a significant positive effect on the market capitalization of banks listed in the Kenyan stock exchange market.

Specific Objective 4: Determine the effect of internet banking innovation on market capitalization of listed commercial banks in Kenya

The fourth objective was to determine the effect of Internet Banking financial innovations on the market capitalization of the Kenyan banks listed in the Kenyan stock market. The null hypothesis was that Internet banking has no significant effect on the market capitalization of listed commercial banks in Kenya.

The study findings revealed that Internet banking had a significant influence on the market capitalization of listed commercial banks in Kenya (z-statistic=2.39, p-value=0.017<0.05). Therefore at 5% significance level, the null hypothesis was not rejected, therefore for every unit increase in Internet banking, there was a corresponding increase in market capitalization by 0.399 units.

The listed banks have adopted internet banking and revenue generation, increasing the market capitalization of the banks. Again, Interest on the loans issued through internet banking has increased hence increasing the market value of the bank for the last 5 years. Finally, internet banking has increased the market share of the bank over the last 5 years.

Specific Objective 5: Evaluate the moderating effect of banks ownership on the relationship between financial innovations and market capitalization of listed commercial banks in Kenya

Interaction of Bank ownership and Agency Baking was not significant since the p-value=0.104>0.05 level of significance, Interaction of Bank ownership and Mobile Baking was not significant since the p-value=0.260>0.05 level of significance, the interaction between Bank ownership and Plastic credit card innovations was not significant since the p-value=0.128>0.05 level of significance, the interaction term between Bank ownership and Internet Banking was not significant since the p-value=0.125>0.05 level of significance. Therefore, the hypothesis of no moderating effect was not rejected concluding that bank ownership has no moderating effect on the market capitalization of listed commercial banks in Kenya. The findings revealed that local and foreign ownership did not affect the relationship between financial innovations and market capitalization of listed commercial banks in Kenya.

5.3 Conclusions

The findings revealed that financial innovations, namely: Plastic Credit card innovation and Internet Banking, had a statistically significant positive effect on the market capitalization of listed commercial banks in Kenya. The findings also revealed that Agency Banking and Mobile Banking had a positive effect on Market Capitalization though not statistically significant. The findings also revealed that bank ownership (local or foreign) did not have a moderating effect on the relationship between financial innovations and market capitalization of listed commercial banks in Kenya. Since the overall random-effects model involving all the financial innovations against market capitalization was significant, it was concluded that financial innovations had a significant effect on the market capitalization of listed commercial banks in Kenya

Based on the research results in this study, it is judicious to conclude that financial innovations namely: Agency banking, mobile banking, plastic card innovation and internet banking influences market capitalization listed commercial banks in Kenya positively. This implies that financial innovations should be critical factors to

consider to improve the market capitalization of Kenyan commercial banks listed in the stock exchange to be competitive and have increased market performance.

5.4 Recommendations of the Study

This section presents recommendations of the study which are based on the findings are given per each objective of the study.

It is recommended that listed banks should embrace agency banking by increasing the number of agents and should cover all regions in Kenya. Again, members of the public should be encouraged to make cash deposits and cash withdrawals from agents to increase the market value. The customers should again be encouraged to be regular users of the agents to increase the number of transactions; this would increase the market capitalization.

The study again recommends that customers and banks should embrace the use of mobile for banking services. More mobile transactions are encouraged to increase the market value. Again, more mobile users should be encouraged as it is an easier option, cheaper and convenient.

The study again recommends that listed banks should institute credit cards to its customers as the income from these cards will increase the market value of the bank. Further, the number of credit cards issued to customers should also be increased over time and customers should be encouraged to use credit cards to increase the market share. Correct measures such as favourable laws and regulations should be created to allow a favourable environment for the adoption of financial innovations

Finally, it is recommended that banks should adopt internet banking to increase in revenue generation and increasing the market value of the bank. Furthermore, banks should work on increasing interest in the loans issued through internet banking.

This academic study has important theoretical and contextual contribution in both academics around financial innovations and banking industry managerial decision making. This study confirmed the theory of Modigliani that linked innovations to market value. As discussed above, different types of financial innovations indicated

varying positive effect on the market capitalization of Listed Commercial Banks in Kenya. This implies that in analysing the effect of financial innovation on market capitalization in the banking industry, each financial innovation should be treated individually and differently because of the differences in effect thought the overall effect of the financial effect on market capitalization was significant.

Regarding academic contribution, the finding that market capitalization is positively influenced by financial innovation indicates that this type of investment can be regarded as appropriate. Due to this fact alongside the outcome that different financial innovations have varying effects on market capitalization suggests that when the analysts pursue an in-depth evaluation, varying kinds of financial innovations and distinct company performance measurements should be adopted. This agreed with the empirical studies that supported that financial innovations have a significant positive effect on the market capitalization of commercial banks in Kenya. Theoretically, this study confirmed that past information's and investment like financial innovations affect market capitalization and this was in line with the technical analysis which postulates that the future price of a security can be predicted and forecasted based on the information and it is not possible to predict market because prices of stock reflect all information available. The findings also confirmed finance theories Modigliani theoretical preposition, Efficient Market Hypothesis and Random Walk theories of market prices that postulated that prices of the securities in a stock market are difficult to be predicted. Furthermore, the findings of this study confirmed Silber's theory, Schumpeter theory, Merton Market efficiency theory and Transaction cost theory that reported that there exists a link between financial innovation and market value.

As for managerial contribution, using market capitalization as a measure of market value allows for the examination of the effect of financial innovation on performance by estimating market predictions on future profits. This method is a forward-looking measure of firm performance and it overcomes the backwards-looking traditional method of assessing firm profitability. The use of share prices to determine the effect of financial innovation can be used by the management to determine if there is any need to proceed with a type of innovation. Furthermore, the finding that financial

innovation has a positive effect on the market capitalization of commercial banks listed at NSE, Kenya implies that an innovative bank is a healthy one. Therefore, any bank initiating financial innovations, regardless of whether they are internal or external, should always innovate through news release in a public relations system that is well executed.

5.5 Suggestions for further research

Financial innovations namely: Agency banking, mobile banking, plastic card innovation and internet banking were found to contribute a total of 75.3% of any variation or change that occurs in market capitalization of listed banks in Kenya. This is not exhaustive and therefore, a further study could be conducted to identify the other innovations which contribute to the rest 24.7%. Further research can be carried on the comprehensive effect of differentiated effects of innovation types on market capitalization in the non-banking industry like insurance, manufacturing. Schumpeterian classifications method can be used to identify the differentiated effects of the various financial innovations. Furthermore, the other taxonomies would provide broader academic perspective in this area.

An event study could be carried out on the effect of financial innovation on the market capitalization of non- listed commercial banks in Kenya. Financial innovation decisions in any industry imply enormous investment as big fixed costs are involved and this makes such decisions to be considered concerning risk as this would determine the company's profitability. Due to this fact, further research can be carried to examine the effect of financial innovation on the risk of a company's market value.

Further research could be conducted on whether financial innovations affect market capitalization while using time as a grouping variable.

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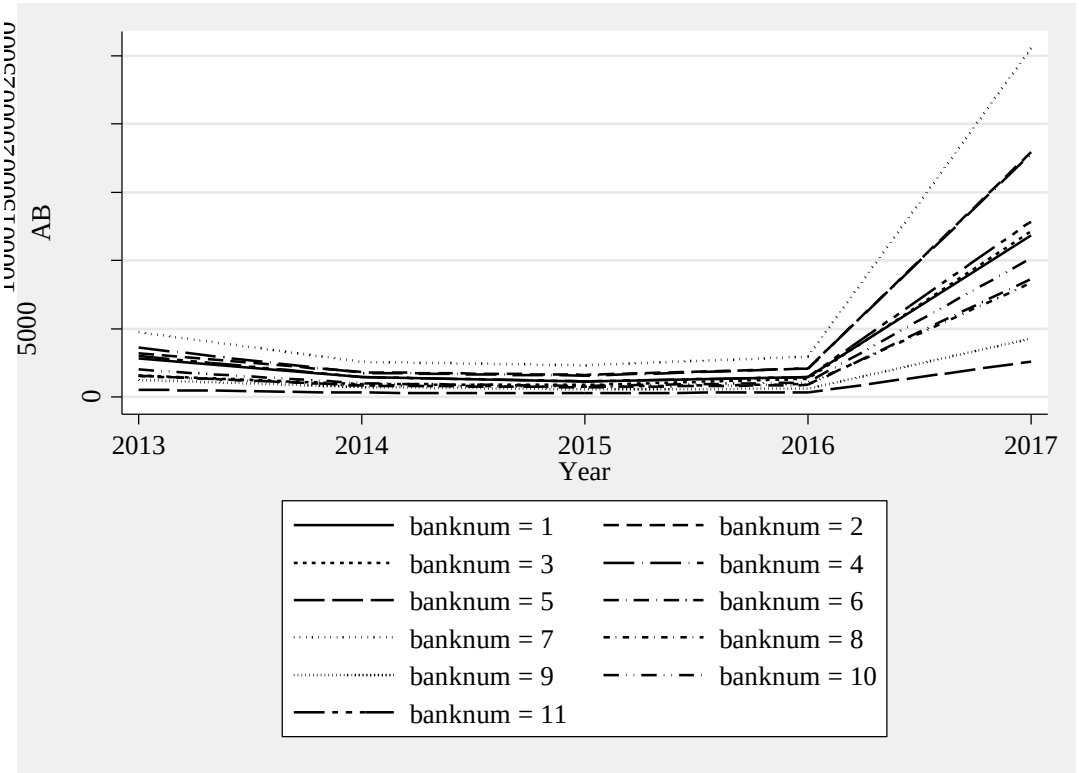
APPENDICES

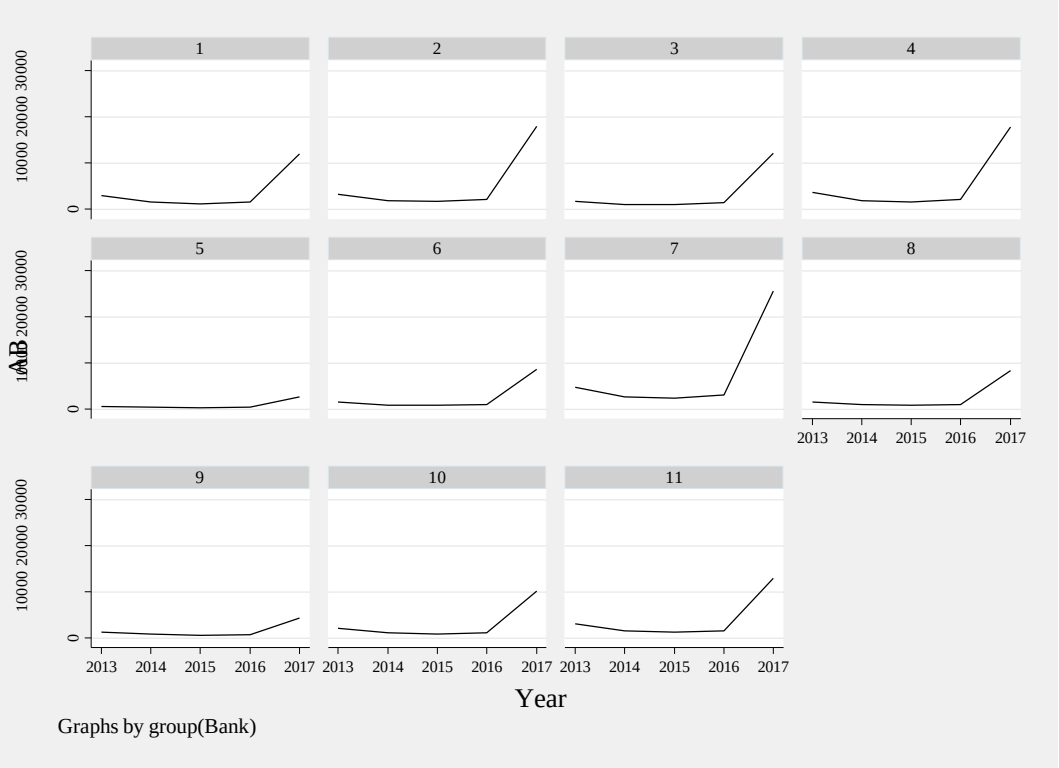
Appendix I: Trend plots

1. Agency banking

The growth trend of Agency banking over time from 2013 to 2017.



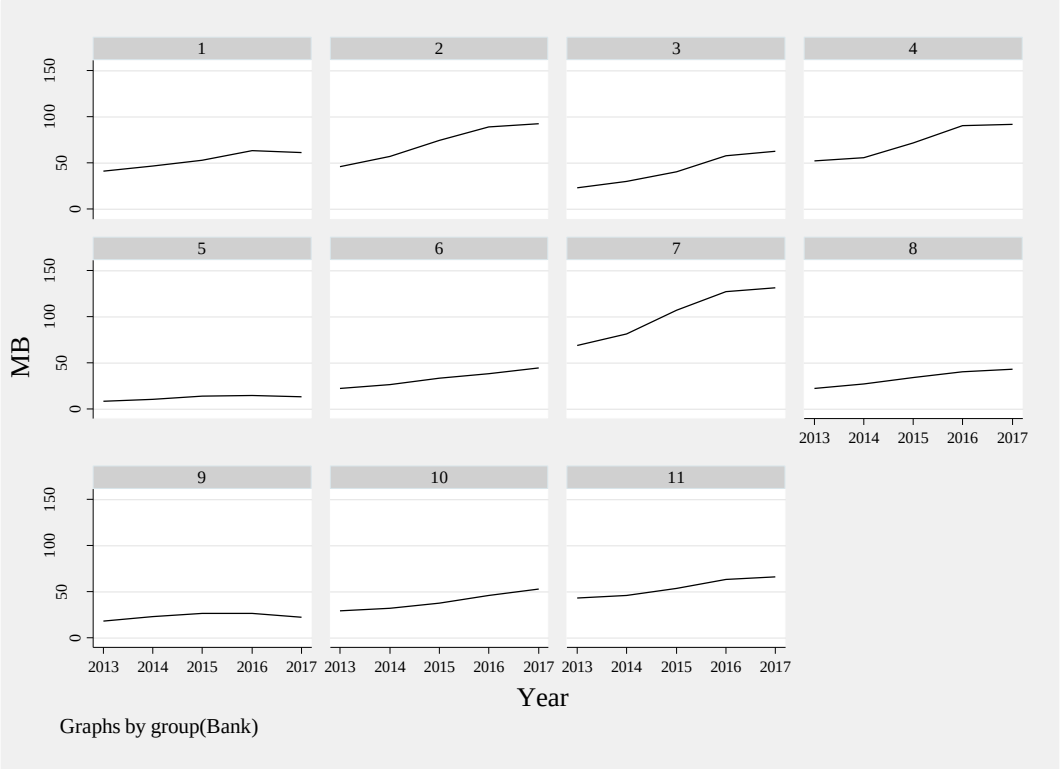
a. Combined analysis of Agency banking from 2013 to 2017



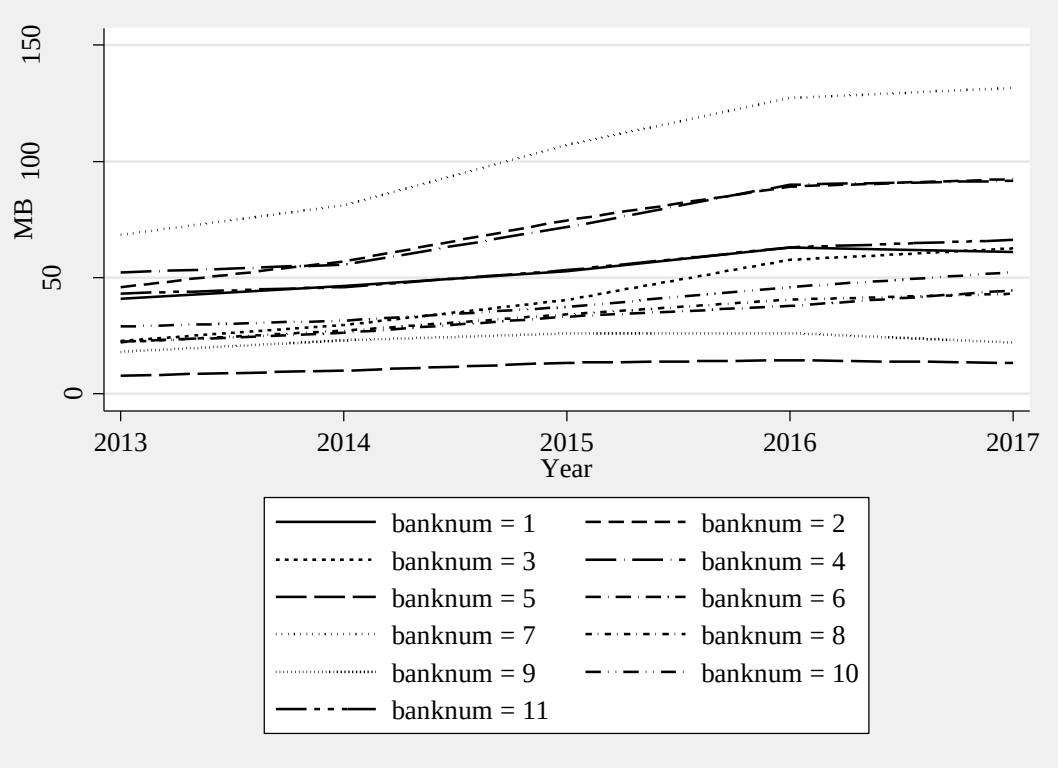
b. Analysis of Agency banking for the 11 listed banks over a five-year period

2. Mobile banking

The growth trend of mobile banking over time from 2013 to 2017.

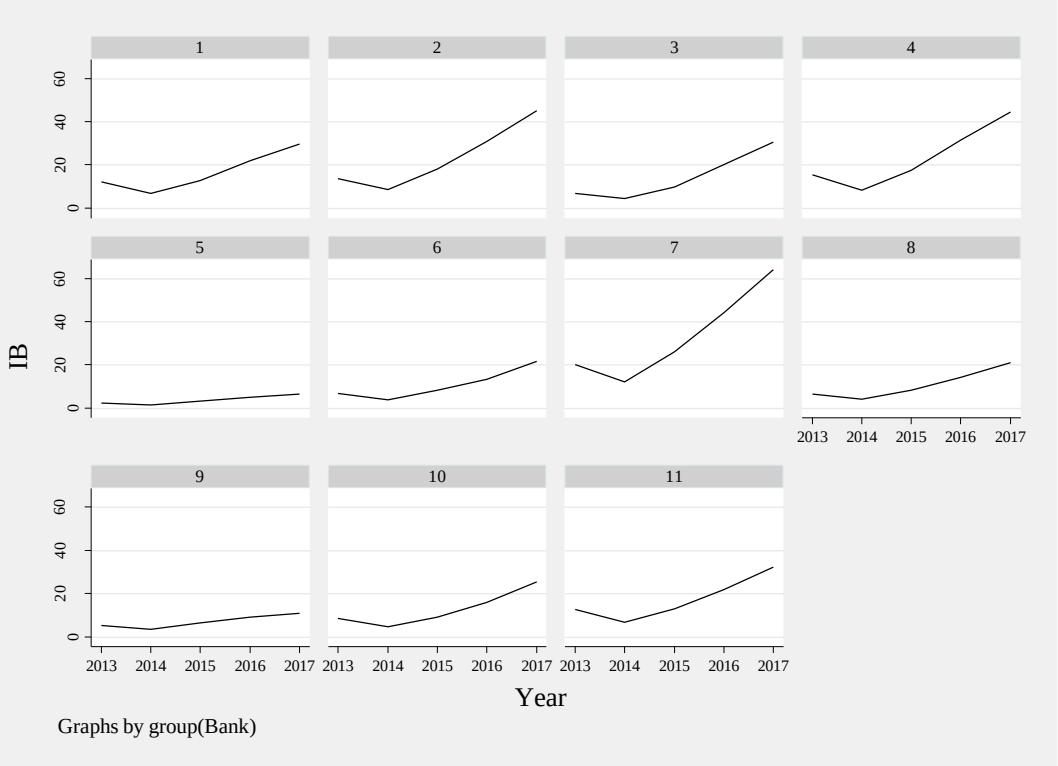


a. Analysis of mobile banking for the 11 listed banks over five years

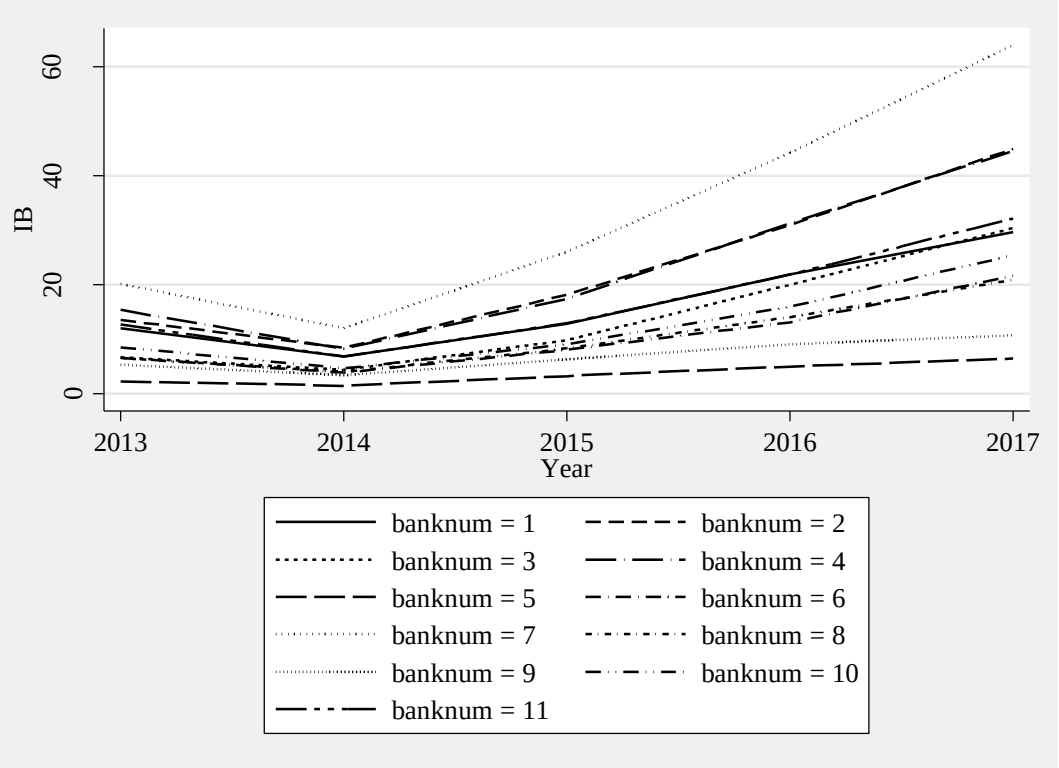


b. Combined analysis of Mobile banking from 2013 to 2017

The growth trend of Internet banking over time from 2013 to 2017.



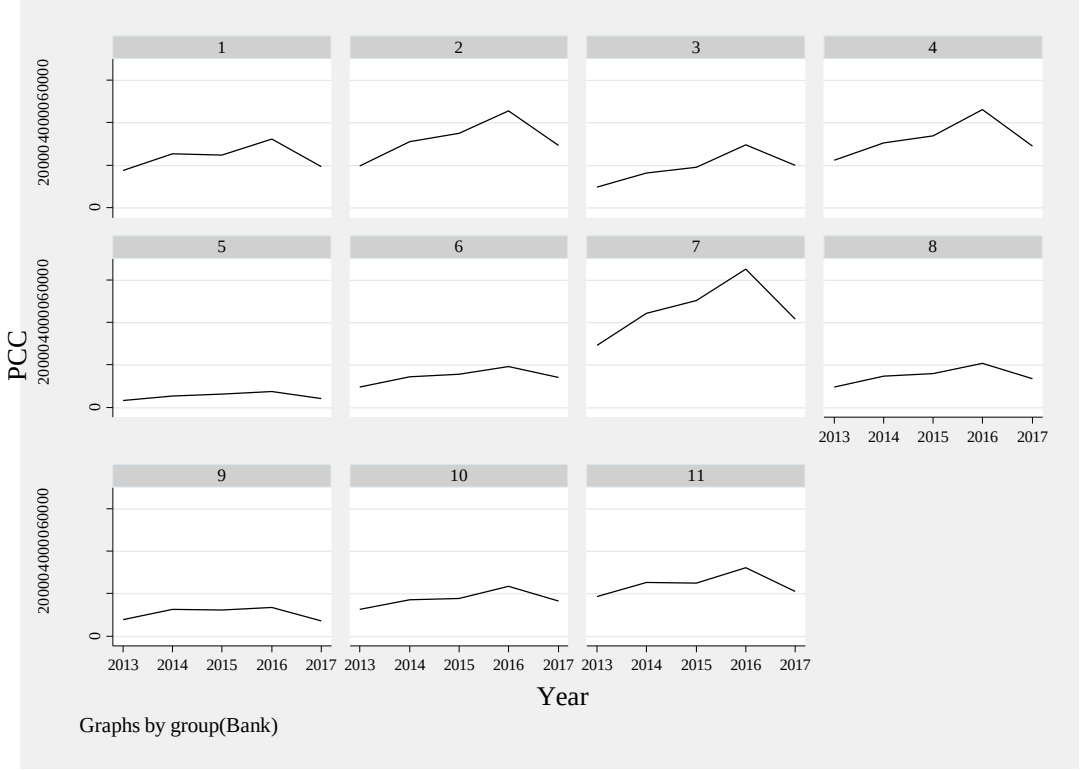
c. Analysis of Internet banking for the 11 listed banks over a five-year period



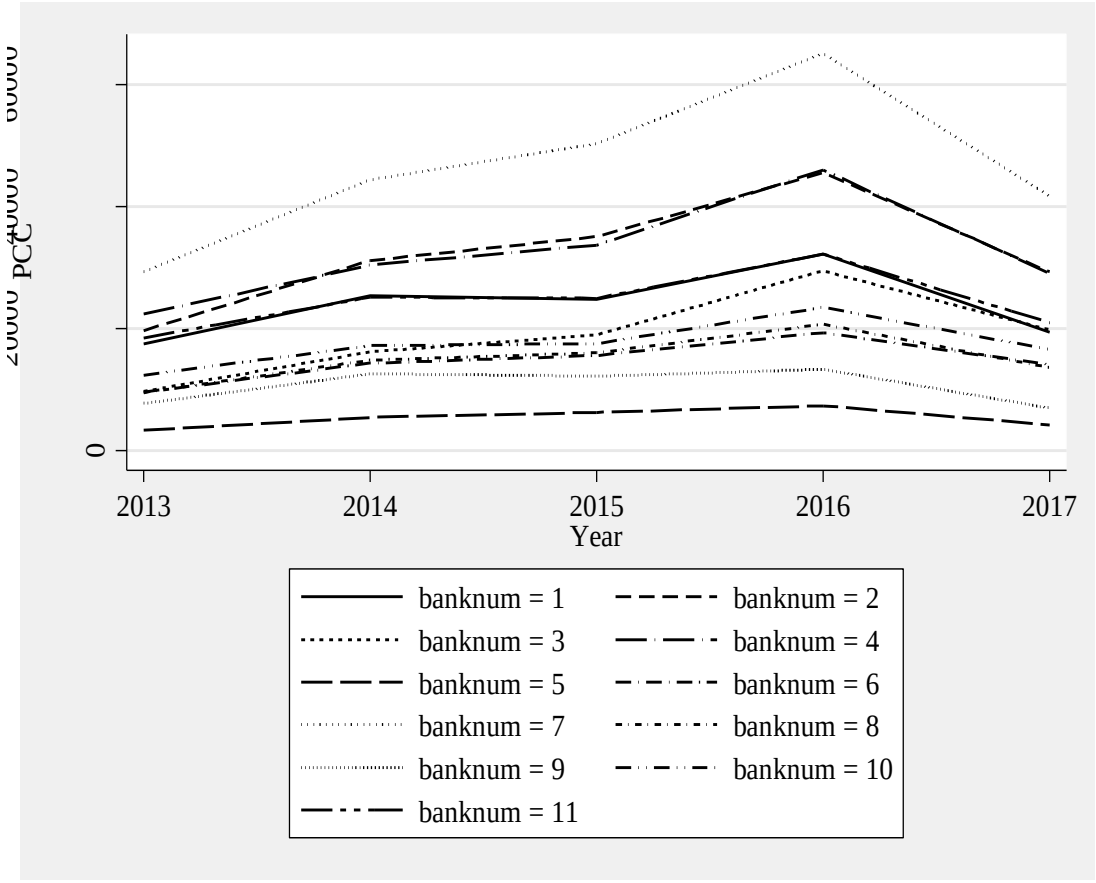
d. Combined analysis of Internet banking from 2013 to 2017

3. Plastic credit card innovation

shows the growth trend of plastic credit card innovation over time



a. Analysis of Plastic credit card innovation for the 11 listed banks over a five-year period



b. Combined analysis of Plastic credit card innovation from 2013 to 2017

Appendix II: Secondary Data Collection Sheet

Year	Agency Banking (M)				Mobile Banking(M)				Internet Banking (M)				Plastic Credit Card (M)				Market Capitalization (M)			
Name of the Bank	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
KCB Bank Kenya Ltd																				
Co-operative Bank of Kenya Ltd																				
Equity Bank Kenya Ltd																				
Standard Chartered Bank (K) Ltd																				
Diamond Trust Bank (K) Ltd																				
Barclays Bank of Kenya Ltd																				
Stanbic Bank Kenya Ltd																				
I&M Bank ltd																				
NIC Bank Kenya PLC																				
National Bank of Kenya																				
Housing Finance Ltd																				
Totals																				

AppendixIII: Kenya's listed banking sector Market Capitalization

Bank	Share Price	No. of Shares Issued (bn)	Market Capitalization (bn)
National Bank of Kenya	9.9	0.3	3.0
Housing Finance	10.4	0.3	3.6
Stanbic Holdings	71.05	0.4	28.3
NIC Bank	33.5	0.6	21.4
Diamond Trust Bank Kenya	152.0	0.3	42.5
I&M Holdings	101.0	0.4	39.6
Barclays Bank of Kenya	9.6	5.4	52.1
KCB Group	37.0	3.1	114.9
Standard Chartered Bank Kenya	207.0	5.9	100.9
Cooperative Bank of Kenya	17.2	5.9	100.9
Equity Group Holdings	39.0	3.8	147.2

Price as at 16/06/2017

(Source: Cytonn Banking Sector Report, 2017)

Commercial Banks and Mortgage Finance Shareholding Information

I. Institutions in Terms of Shareholding

a) Foreign-owned institutions

i) Foreign-owned not locally incorporated

- Bank of India
- Citibank N.A. Kenya
- Habib Bank A.G. Zurich
- Habib Bank Ltd.

ii) Foreign-owned but locally incorporated institutions (Partly owned by locals)

- Bank of Baroda (K) Ltd.
- Barclays Bank of Kenya Ltd.
- Diamond Trust Bank Kenya Ltd.
- K-Rep Bank Ltd.
- Standard Chartered Bank (K) Ltd.
- Ecobank Ltd
- Gulf Africa Bank (K) Ltd
- First Community Bank

iii) Foreign-owned but locally incorporated institutions

- Bank of Africa (K) Ltd.
- UBA Kenya Bank Limited

b) Institutions with Government participation

- Consolidated Bank of Kenya Ltd.
- Development Bank of Kenya Ltd.
- Housing Finance Ltd.
- Kenya Commercial Bank Ltd.
- National Bank of Kenya Ltd.
- Stanbic Bank Kenya Limited.

c) Institutions locally owned

- African Banking Corporation Ltd.
- Jamii Bora Bank Ltd.
- Commercial Bank of Africa Ltd.
- Co-operative Bank of Kenya Ltd.
- Credit Bank Ltd.
- Charterhouse Bank Ltd.
- Chase Bank (K) Ltd.
- Dubai Bank Kenya Ltd
- Equatorial Commercial Bank Ltd.
- Equity Bank Ltd.
- Family Bank Ltd.
- Fidelity Commercial Bank Ltd.
- Fina Bank Ltd.
- Giro Commercial Bank Ltd.

- Guardian Bank Ltd.
- Imperial Bank Ltd.
- Investment & Mortgages Bank Ltd.
- Middle East Bank (K) Ltd.
- NIC Bank Ltd.
- Oriental Commercial Bank Ltd.
- Paramount Universal Bank Ltd.
- Prime Bank Ltd.
- Trans-National Bank Ltd.
- Victoria Commercial Bank Ltd.

II. Institutions listed on the NSE

- Barclays Bank of Kenya Ltd.•

  Stanbic Bank Kenya Limited.
- Equity Bank Ltd.
- Housing Finance Ltd.
- Kenya Commercial Bank Ltd.
- NIC Bank Ltd.
- Standard Chartered Bank (K) Ltd.
- Diamond Trust Bank Kenya Ltd
- National Bank of Kenya
- Co-operative Bank of Kenya Ltd

Source: CBK shareholding information 2017