THE EFFECT OF INTERNET BANKING RISK MANAGEMENT STRATEGIES ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

BY

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A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2015

DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university for examination.

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This project has been presented for examination with my approval as the University supervisor.

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ACKNOWLEDGEMENTS

I thank God for His unceasing love in granting me the opportunity to pursue my MBA degree and the ability to successfully undertake the research.

I also express my sincere gratitude to my supervisor, Mr. Herrick Ondigo, for his invaluable guidance throughout the research work without which it would have been a rocky road to trade on.

Finally, I also appreciate the University of Nairobi for offering a flexible MBA programme to allow even for the employed to fulfill their academic dreams.

DEDICATION

To my husband Daniel and my children Diana Naliaka, Eileen Makutwa and Beryl Neema.

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LIST OF ABBREVIATIONS

BCBS	Basel Committee on Banking Supervision
CAMEL	Capital, Asset, Management, Earnings and Liquidity
CAMELS	Capital, Asset, Management, Earnings, Liquidity and Sensitivity to risk
CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
CEO	Chief Executive Officer
COSO	Committee of Sponsoring Organizations of the Treadway Commission
ERM	Enterprise Risk Management
EU	European Union
GDP	Gross Domestic Product
GDP	Gross Domestic Product
INR	Indian Rupee
NIE	New Institutional Economics
NIM	Net Interest Margin
NPL	Non-Performing Loans
NRI	Non-Resident Indian
ROA	Return on Assets
ROE	Return on Equity
SAS	Statistical Analysis System
USA	United States of America
ANOVA	Analysis of Variance
IRMP	Internet Risk Management Practices

ABSTRACT

The banking industry in Kenya is faced with various risks that are prevalent in the financial sector. As these risks heighten, there is need for banks to manage them better. Better management of risks may have a profound effect on firm performance in terms of reducing the risks and therefore reducing the losses. The study sought to examine the effect of internet banking risk management practices on the financial performance of commercial banks in Kenya. This study adopted a descriptive study design. The population of this study was all the 43 commercial banks in Kenya. Data was collected using primary sources and secondary sources. The primary data was collected using structured questionnaire which was administered to risk managers. The data on financial performance was sought from the financial statements of respective banks. Other financial data were also sought from the financial statements to compute the control variables. The data was collected for a five year period from 2010 to 2014. Data was analysed using descriptive analysis, correlation analysis and regression analysis. The study found that that internet banking risk management practices had a positive but insignificant effect on financial performance (β = .000, p = .820). The results also showed that capital adequacy had a positive but insignificant effect on financial performance (β = .000, p = .925). The study also revealed that asset quality had a positive but insignificant effect on the financial performance (β = .009, p = .531). The results showed that management quality had a positive and significant effect on the performance of commercial banks (β = .075, p = .000). It was revealed that earnings quality had a positive and significant effect on the financial performance of banks (β = .227, p = .000). The further found that liquidity had a negative but insignificant effect on the financial performance of banks in Kenya (β = -0.011, p = .165). It is concluded that internet banking risk management does not influence the performance of commercial banks in Kenya. The study recommends that while this study did not find any significant effect of internet banking risk management practices on the performance of banks, commercial banks should invest in better interest risk management practices in order to reduce risks and, therefore, curb fraud through internet banking. It is also recommended that the Central Bank of Kenya as the regulator of commercial banks should conduct risk audits that focus on internet banking risk management practices and report on the findings in order to alert the management on the areas of weaknesses that need further work.

CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Corporate scandals and diminished confidence in financial reporting among investors and creditors have renewed corporate governance as a top-of-mind priority for boards of directors, management, auditors, and stakeholders. At the same time, the number of companies trying to manage risk across the entire enterprise is rising sharply (Sobel and Reding, 2004). Risk management helps ensure effective reporting and compliance with laws and regulations, and helps avoid damage to the entity's reputation and associated consequences. It delivers a current, credible understanding of the risks unique to an organization across a broad spectrum that includes all types of risk (credit risk, operational risk, market risk, liquidity risk and trading risk), lines of business and other key dimensions (SAS, 2010).

Risk management strategies are the actions that firms take in order to respond to the identified risks (Liebenberg and Hoyt, 2003). There are a number of risks that firms deal with. These are credit risks, market risks, liquidity risks and operational risks (Nocco and Stulz, 2006). Credit risk arises from the potential that an obligator is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in economic loss to the bank. Market risk is the risk that the value of on and off-balance sheet positions of a financial institution will be adversely affected by movements in market rates or prices such as interest rates, foreign exchange rates, equity prices, credit spreads and/or commodity prices resulting in a loss to earnings and capital. Liquidity risk is the potential for loss to an institution arising from either its inability to meet its obligations or to fund

increases in assets as they fall due without incurring unacceptable cost or losses. Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and system or from external events.

Banks can use a number of strategies to manage risks. According to Dorfman (2007), once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories: risk avoidance, risk abatement, risk allocation and risk retention. Examples of risk management strategies include hedging. According to the Basel Committee on Banking Supervision (BCBS), e-banking risks, in which internet banking risks fall under, can be managed through three broad ways: board and management oversight, security controls and legal and reputational risk management. According to Uppal (2011), internet banking risks can be managed through using access controls, firewalls, security infrastructure, penetration testing, back-up and recovery, among other measures.

1.1.1 Internet Banking Risk Management Strategies

Internet banking refers to the system that enables bank customers to access accounts and general information on bank products and services through a personal computer or other intelligent device (Uppal, 2011). From a supervisory perspective, risk is that events, expected or unexpected, which have an adverse impact on the bank's earnings or capital (Saxena, 2003). There are three basic kinds of internet banking which are being employed in the market place. These are informational, communicative, and transactional internet banking (Ramakrishnan, 2001). Informational internet banking is the basic level of internet banking. Typically, the bank has marketing information about the bank's products and services on a

stand-alone server. Communicative internet banking allows some interaction between the bank's systems and the customer. The interaction may be limited to electronic mail, account inquiry, loan applications or static file updates. On the other hand, transactional internet banking allows customers to execute transactions. Customer's transactions include accessing accounts, paying bills, and transferring funds, among other transactions.

Internet banking faces a number of risks. One of the risks is credit risk. Internet banking provides the opportunity for banks to expand their geographic range (Georgescu, 2006). Customers can reach a given institution from literally anywhere in the world. In dealing with customers over the internet, absent any personal contract, it is challenging for institutions to verify the credentials of their customers which is an important element in making sound credit decision. Verifying collateral and perfecting security agreements also can be challenging with out-of-area borrowers. Unless properly managed, internet banking could lead to a concentration in out-of-area credits.

The second risk is interest rate risk. Uppal (2011) defines interest rate risk as the risk to earnings or capital, arising from movements in interest rates. Interest rate risk arises from differences between the timing of rate changes and the timing cash flows. Internet banking can attract deposits, loans and other relationships from a larger pool of possible customers than other forms of marketing. Greater access to customers who primarily seek the best or term reinforces the need for managers to maintain appropriate asset/liability management systems, including the ability to react quickly to changing market conditions.

The third risk is liquidity risk. Liquidity risk is the risk to earnings or capital arising from a bank's inability to meet its obligations than they come due, without incurring unacceptable losses (Ramakrishnan, 2001). Liquidity risk includes the inability to manage unplanned changes in funding sources. Internet banking can increase deposit volatility from customers who maintains accounts solely on the basis of rate or terms. Asset/liability and loan portfolio management system should be appropriate for products offered through internet banking. Increased monitoring of liquidity and changes in deposits and loans may be warranted depending on the volume and nature of internet account activities.

The fourth risk is foreign exchange risk. Foreign exchange is present when a loan or portfolio of loans is denominated in a foreign currency or is funded by borrowings in another currency (Uppal, 2011). In some cases, banks will enter into multi-currency credit commitments that permit borrowers to select the currency they prefer to use in each rollover period. Banks may be exposed to foreign exchange risk if they accept deposits from non-resident Indians (NRIs) or create accounts denominated in currencies other than Indian Rupee (INR) on internet banking, although this risk is similar to the real account but internet may provide frequently large number of transactions. Appropriate system should be developed if banks engage in these activities.

The fifth is compliance risk. Compliance risk is the risk to earnings or capital arising from violations of, or non conformance with laws, rules, regulations, prescribed practices or ethical standards (Ramakrishnan, 2001). Compliance risk also arises in situations where the laws or rules governing certain banks products or activities of the bank's clients may be

ambiguous or untested. Most internet banking customers will continue to use other bank delivery channels. Accordingly, banks will need to make certain that their disclosures on internet banking channels, including web sites, remain synchronized with other delivery channels to ensure the delivery of a consistent and accurate message to customers.

The seventh is strategic risk. Strategic risk is the current and prospective impact on earnings or capital arising from adverse business decisions, improper implementation of decisions or lack of strategic goals, the business strategies developed to achieve those goals, the resources deployed these goals and the quality of implementation (Sokolov, 2007). The resources need to carry out business strategies are both tangible and intangible. They include communication channels, operating systems, delivery networks and managerial capacities and capabilities. In some cases, banks may offer new products and services via the internet. Sometimes, management does not understand the risk and ramifications of these decisions which cause a loss in the delivery of their product.

The eighth is reputation risk. Reputation risk is the current and prospective impact on earnings and capital arising from negative public opinion (Sergeant 2000). This affects the institution's ability to establish new relationships or services or continue servicing existing relationships. This risk may expose the institution to litigation, financial loss or a decline in its customer base. Reputation risk exposure is present throughout the organization and includes the responsibility to exercise an abundance of caution in dealing with customer and community. A bank's reputation can suffer if it fails to deliver on marketing claims or to provide accurate timely services. This can include failing to adequately meet customer credit

needs, providing unreliable or inefficient delivery systems, untimely responses to customer inquiries, or violations of customer privacy expectations. Sometimes internet banking services are poorly executed which cause a damage to bank's reputation.

The last is transaction risk. Transaction risk is the current and prospective risk to earnings and capital arising from fraud, errors and inability to deliver products or services, maintain a competitive position and manage information (Florina, Liliana, and Viorica, 2008). Transaction risk is evident in each product and service offered and encompasses product development and delivery, transaction processing, system development, computing systems, complexity of products and services and the internal control environment. A high level of transaction risk may exist with internet banking products, particularly if these lines of business are not adequately planned, implemented and monitored.

According to Dorfman (2007), once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories: risk avoidance, risk abatement, risk allocation and risk retention. Examples of risk management strategies include hedging. According to the Basel Committee on Banking Supervision (BCBS), e-banking risks, in which internet banking risks fall under, can be managed through three broad ways: board and management oversight, security controls and legal and reputational risk management. According to Uppal (2011), internet banking risks can be managed through using access controls, firewalls, security infrastructure, penetration testing, back-up and recovery, among other measures.

1.1.2 Financial Performance

Performance encompasses three specific areas of firm outcomes namely financial performance (profits, return on assets, return on investment); market performance (sales, market share); and shareholder return (total shareholder return, economic value added) (Divenney et al., 2008). Performance is the ultimate dependent variable of interest for those concerned with just about any area of management: accounting is concerned with measuring performance; marketing with customer satisfaction and market share; operations management with productivity and cost of operations, organizational behaviour with employee satisfaction and structural efficiency; and finance with capital market response to all of the above.

Performance is so common in organizational research that it is rarely explicitly considered or justified; instead it is treated as a seemingly unquestionable assumption (Devinney et al., 2005). The multidimensionality of performance covers the many ways in which organizations can be successful; the domain of which is arguably as large as the many ways in which organizations operate and interact with their environment. Meulbroek (2002) and Hoyt et al, (2008) study the value of enterprise risk management (ERM) in the US insurance Industry by measuring the effect of ERM implementation on the value of the firm as measured by Tobin Q (ratio of company's market value to its replacement cost of assets). Tobin suggested that the combined market value of all the companies on the stock market should be equal to their replacement costs, Tobin (1969) and Hayashi (1982). The Q ratio is theoretically defined as the market value of a company's assets divided by the replacement value of the company's assets. Then, when the assets are priced properly in the capital

market, the Q ratio should be equal to one. In their survey of evidence of whether risk management adds value to companies, Smithson et al (2005) found that 9 studies on risk management and the value of the firm also used Tobin's Q to proxy firm value.

Another measure of performance is Return on Assets (ROA) which is an indicator of how profitable a company is relative to its total assets. It gives an idea as to how efficient management is at using its assets to generate earnings. Related to this measure is Return on Equity (ROE) which is the amount of net income as a percentage of shareholders equity. It measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested (Pagach and Warr, 2010). In a number of studies that assess the (financial) performance of risk management strategies, the impact is measured by excess stock market returns (Gordon, Loeb, and Tseng, 2009), cost and revenue efficiency including ROA (Grace et al., 2013) measured as net profit divided by total assets or several financial variables, such as financial leverage (measured as total debt divided by total equity), return on equity (ROE) measured as net profit divided by total equity, as well as stock price and cash flow volatility (Pagach and Warr, 2010). This study uses ROA and ROE.

1.1.3 Effect of Internet Banking Risk Management on Financial Performance

Studies on the relationship between risk management and financial performance of banks mostly have been conceptual in nature, often drawing the theoretical link between good risk management practices and improved bank performance. Schroeck (2002) and Nocco and Stulz (2006) stress the importance of good risks management practices to maximize firms'

value. In particular, Nocco and Stulz (2006) suggests that effective enterprise risk management have a long-run competitive advantage to the firm (or banks) compared to those that manage and monitor risks individually. It is, therefore suggested that companies to manage risks strategically by viewing all the risks together within a coordinated manner. In relation to this, Stulz (1996) associates good risk management practices with the elimination of costly lower-tail outcomes by proposing "full-cover" risk management as compared to "selective" risk management. The study suggests that prudent risks management is important in reducing the bankruptcy costs. Additionally, in the case of the USA, there are potential benefits that risk management could also reduce taxes.

Several other studies draw the link between good risk management practices with improved financial performances (for example, Schroeck, 2002). In particular, these studies propose that prudent risk management practices reduce the volatility in banks' financial performance, namely operating income, earnings, firm's market value, share return and return on equity. Schroeck (2002) proposes that ensuring best practices through prudent risk management result in increased earnings.

Despite the voluminiuos studies on the link between risk management practices and companies performance, studies providing empirical evidence on the link between risk management practices and bank financial performance, to our knowledge, has been somewhat limited. Among these studies, Drzik (2005) shows that bank investment in risk management during 1990s helped to reduce earnings and loss volatility during the 2001 recession. In the same vein, the study by Pagach and Warr (2007) examines factors that

influence the firm level of ERM and finds that the more leveraged the firms are, the more volatile are their earnings. Using the hazard model to examine factors that influence firms' adoptions of the ERM, the study documents firms that are more levered, more volatile earnings, and poorer stock performances, are more likely to adopt ERM.

A different dimension of analyzing the relationship between risk management and financial performance is offered by Angbazo (1997). By testing the influence of risk factors in determining banks' profitability, the study finds that default risk is a determinant of banks' net interest margin (NIM) and the NIM of super-regional banks and regional banks are sensitive to interest rate risk as well as default risk. The study by Saunders and Schumacher (2000) provides further support to the importance of controlling risks to financial performance. By investigating the determinants of NIM for 614 banks of 6 European countries and US from 1988 to 1995, the study finds that interest rate volatility has a positive significant impact on the banks profitability.

Hakim and Neamie (2001) examine the relationship between credit risk and bank's performance of Egypt and Lebanon bank in 1990s. Using data for banks from the two countries over the period 1993-1999, the study estimates a fixed effects model of bank return with varying intercepts and coefficients. The findings show that credit variable is positively related to profitability, while liquidity variable is insignificant across all banks and have no impact on profitability. The study also finds a strong link between capital adequacy and commercial bank return, with high capitalization being the hindrance to return.

1.1.4 Commercial Banks in Kenya

Commercial banks are licensed and regulated under the Banking Act, Cap 488 and Prudential Regulations issued there-under. There are currently 43 commercial banks in Kenya. Out of the 43 banks, 30 are locally owned and 13 are foreign owned. The locally owned financial banks comprise 3 banks with significant government shareholding and 27 privately owned commercial banks (Central Bank of Kenya, 2014). The commercial banks in Kenya face a number of risks such as internet banking risks, market risk, and liquidity risks, among others. Banks have hedged against these risks and this has been a critical strategy employed by banks in Kenya.

The Domestic credit provided by banking sector as a percentage of GDP in Kenya was reported at 40.09% in 2014, according to the World Bank. The commercial banks have been selected for the study because of the recent emphasis on risk management in Kenyan banking driven by the Central Bank of Kenya (CBK) guidelines as well as banks' own recent initiatives towards risk management. A process of financial liberalization was initiated in the 90s to make the banking system profitable, efficient, and resilient. The liberalization measures consisted of deregulation of entry, interest rates, and branch licensing, as well as encouragement to state owned banks to get listed on stock exchanges. With the liberalization came risks that banks needed to manage. It is therefore a suitable time to perform an analysis of risk management strategies in Commercial Banks in Kenya. The Basel-II norms, which include a move towards better risk management practices, also necessitate such a study (Central Bank of Kenya, 2014).

1.2 Research Problem

In recent years, risk management has received increasing focus as a central activity of commercial banks. According to Saunders and Cornett (2006), modern financial institutions are in the risk management business as they undertake the functions of bearing and managing risks on behalf of their customers through the pooling of risks and the sale of their services as risk specialists. Technology also creates risk particularly internet banking risk. There is always lurking danger of hackers and cyber criminals who can access the bank accounts and cause havoc. Thus internet banking creates new challenges for banks as it opens fresh way of exposure.

The banking industry in Kenya is faced with various risks that are prevalent in the financial sector. As these risks heighten, there is need for banks to manage them better. Better management of risks may have a profound effect on firm performance in terms of reducing the risks and therefore reducing the losses. At the international level the Basel Committee on Banking Supervision (BCBS) has elaborated risk management principles for e-banking. These risk management principles fall into three broad, and often overlapping, categories: Board and Management Oversight, Security Controls and Legal and Reputational Risk Management. The focus of this study is to establish whether these risk management principles are implemented at the listed banks in Kenya and the extent to which they influence bank performance.

A search on studied on risk management in Kenya yielded studies done on credit risk management (Njiru, 2003; Kioko, 2008; Ngare, 2008; Simiyu, 2008; and Wambugu, 2008),

information systems risk management (Weru, 208) and foreign exchange risk management (Kipchirchir, 2008). In as much as Kioko (2008) and Ngare (2008) focused on commercial banks, the concept that they focused on was credit risk management techniques. The closest study so far was by Wambua (2010) on enterprise risk management strategies and practices in commercial banks in Kenya. The study did not cover strategies used to manage internet banking risks. A study by Uppal (2011) in India on internet banking risk mitigation strategies noted the influence of internet banking on performance and only proposed the strategies the banks could use to manage internet banking risks. The study failed to specifically identify the strategies that had been used to manage internet banking risks. It is clear from the studies above that internet banking risk management has largely been neglected by scholars. There is therefore a gap as far as studying the internet risk management strategies adopted by listed commercial banks in Kenya is concerned. As far as this study is concerned, this is the first study in Kenya that has attempted to assess the risk mitigation strategies used by banks towards internet banking. The study therefore sought to answer the following research question: what is the effect of internet banking risk management strategies on the performance of commercial banks in Kenya?

1.3 Research Objective

To determine the effect of internet banking risk management strategies on the financial performance of commercial banks in Kenya.

1.4 Value of the Study

This study may be important to various groups of people. The policy makers can obtain knowledge of the financial sector dynamics as regards risk management strategies in Kenya.

They can therefore obtain guidance from this study in designing appropriate Risk management strategies and policies that may regulate the sector. The investors will find this study very helpful as far as ascertaining the impact of internet banking risk management strategies on performance in order to guide them on which banks to invest in as far as their risk exposures are and as far as they manage their risks.

The insurance agencies will also gain a great deal from the findings on internet banking risks. This will inform them on the premiums that the banks should pay attributable to internet banking risks. The study can provide information to potential and current scholars on risk management among Commercial Banks in Kenya. This can expand their knowledge on strategic responses in financial institutions and also identify areas of further study.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review. First, a theoretical review is provided focusing on the theories related to risk mitigation. Secondly, the empirical review of the studies that have been done on risk mitigation strategies and firm performance is shown. The summary of chapter as well as the research gap is provided.

2.2 Theoretical Review

Four theories are found relevant in risk management and are therefore discussed. These are the financial economics theory, the agency theory, the new institutional economics theory, and the stakeholder theory.

2.2.1 Financial Economics Approach

This theory can be traced to Miller and Modigliani (1958). Financial economics approach to corporate risk management has so far been the most prolific in terms of both theoretical model extensions and empirical research. This approach builds upon classic Modigliani-Miller paradigm (Miller and Modigliani, 1958) which states conditions for irrelevance of financial structure for corporate value. This paradigm was later extended to the field of risk management. This approach stipulates also that hedging leads to lower volatility of cash flow and therefore lower volatility of firm value. Rationales for corporate risk management were deduced from the irrelevance conditions and included: higher debt capacity (Miller and Modigliani, 1963), progressive tax rates, lower expected costs of bankruptcy (Smith and Stulz, 1985), securing internal financing (Froot et al., 1993), information asymmetries

(Geczy et al., 1997) and comparative advantage in information (Stulz, 1996). The ultimate result of hedging, if it indeed is beneficial to the firm, should be higher value – a hedging premium.

Evidence to support the predictions of financial economics theory approach to risk management is poor. Although risk management does lead to lower variability of corporate value (e.g. Jin and Jorion, 2006), which is the main prerequisite for all other effects, there seems to be little proof of this being linked with benefits specified by the theory. One of the most widely cited papers by Tufano (1996) finds no evidence to support financial hypotheses, and concentrates on the influence of managerial preferences instead. On the other hand, the higher debt capacity hypothesis seems to be verified positively, as shown by Faff and Nguyen (2002), Graham and Rogers (2002) and Guay (1999). Internal financing hypothesis was positively verified by Guay (1999) and Geczy et al. (1997), while it was rejected by Faff and Guyen (2002) and Mian (1996). Judge (2006) found evidence in support of financial distress hypothesis. Tax hypothesis was verified positively by Nance, Smith and Smithson (1993), while other studies verified it negatively (Mian, 1996; Graham and Rogers, 2002). More recently Jin and Jorion (2006) provide strong evidence of lack of value relevance of hedging, although some previous studies have identified a hedging premium (Allayannis and Weston, 2001, Carter et al., 2006).

2.2.2 Agency Theory

The theory of agency can be traced back to Stephen Ross and Barry Mitnick who developed it in 1973. Rose (1973) did a seminal paper on agency theory and is the scholar most

associated with this theory. Agency theory extends the analysis of the firm to include separation of ownership and control, and managerial motivation. In the field of corporate risk management agency issues have been shown to influence managerial attitudes toward risk taking and hedging (Smith and Stulz, 1985). Theory also explains a possible mismatch of interest between shareholders, management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value projects (Mayers and Smith, 1987). Consequently, agency theory implies that defined hedging policies can have important influence on firm value (Fite and Pfleiderer, 1995). The latter hypotheses are associated with financing structure, and give predictions similar to financial theory.

Managerial motivation factors in implementation of corporate risk management have been empirically investigated in a few studies with a negative effect (Faff and Nguyen, 2002; MacCrimmon and Wehrung, 1990; Geczy et al., 1997). Notably, positive evidence was found however by Tufano (1996) in his analysis of the gold mining industry in the US. Financial policy hypotheses were tested in studies of the financial theory, since both theories give similar predictions in this respect. All in all, the bulk of empirical evidence seems to be against agency theory hypotheses however. Agency theory provides strong support for hedging as a response to mismatch between managerial incentives and shareholder interests.

2.2.3 New Institutional Economics

This theory was developed by Williamson in 1973 and Williamson (1973 and 1974) was the seminal paper for this theory. A different perspective on risk management is offered by new

institutional economics. The focus is shifted here to governance processes and socio-economic institutions that guide these processes, as explained by Williamson (1998). Although no empirical studies of new institutional economics approach to risk management have been carried out so far, the theory offers an alternative explanation of corporate behavior. Namely, it predicts that risk management practices may be determined by institutions or accepted practice within a market or industry. Moreover, the theory links security with specific assets purchase (Williamson, 1987), which implies that risk management can be important in contracts which bind two sides without allowing diversification, such as large financing contract or close cooperation within a supply chain.

If institutional factors do play an important role in hedging, this should be observable in the data. First of all, there may be a difference between sectors. Secondly, hedging may be more popular in certain periods – in Poland one might venture a guess, that hedging should become more popular with years. A more concrete implication of this theory is that shareholders may be interested in attracting block ownership by reducing company risk. Here NIE is similar in its predictions to agency theory. However this theory also suggests that firm practices may be influenced by the ownership structure in general.

2.2.4 Stakeholder Theory

Stakeholder theory, developed originally by Freeman (1984) as a managerial instrument, has since evolved into a theory of the firm with high explanatory potential. Stakeholder theory focuses explicitly on an equilibrium of stakeholder interests as the main determinant of corporate policy. The most promising contribution to risk management is the extension of

implicit contracts theory from employment to other contracts, including sales and financing (Cornell and Shapiro, 1987). In certain industries, particularly high-tech and services, consumer trust in the company being able to continue offering its services in the future can substantially contribute to company value. However, the value of these implicit claims is highly sensitive to expected costs of financial distress and bankruptcy. Since corporate risk management practices lead to a decrease in these expected costs, company value rises (Klimczak, 2005). Therefore stakeholder theory provides a new insight into possible rationale for risk management. However, it has not yet been tested directly. Investigations of financial distress hypothesis (Smith and Stulz, 1995) provide only indirect evidence (e.g. Judge, 2006).

2.3 Determinants of Bank Financial Performance

The determinants of financial performance for commercial banks have been evaluated in literature using the CAMEL or CAMELS models. CAMEL stipulates the evaluation of financial institutions on the basis of five critical dimensions which are: Capital adequacy, Asset quality, Management, Earnings and Liquidity. Sensitivity to market risk, a sixth dimension was added in 1997 and the acronym was changed to CAMELS (Opez, 1999). These components are used to reflect financial performance, operating soundness and regulatory compliance of financial institutions. In this section, the CAMELS model is reviewed as it contains the risk element that is the basis of this study.

2.3.1 Capital Adequacy

The capital adequacy is rated upon different factors inter alia: The level and quality of capital and the overall financial condition of the institution, the ability of management to address

emerging needs for additional capital, the nature, trend, and volume of problem assets, and the adequacy of allowances for loan and lease losses and other valuation reserves, balance sheet composition, including the nature and amount of intangible assets, market risk, concentration risk, and risks associated with non-traditional activities, risk exposure represented by off-balance sheet activities, the quality and strength of earnings, and the reasonableness of dividends (Ferrouhi, 2014).

Capital is one of the bank specific factors that influence the level of bank profitability. Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation (Athanasoglou et al. 2005). Banks capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Moreover, greater bank capital reduces the chance of distress (Diamond, 2000). However, it is not without drawbacks that it induce weak demand for liability, the cheapest sources of fund Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential loses and protect the bank's debtors. According to Dang (2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect on the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi and Nazir, 2010).

Researchers argue that commercial banks that have higher levels of capital post better financial results than their counterparts who have less capital at their disposal. Staikouras and Wood (2003) claim that "there exists a positive link between a greater equity and financial performance among European Union (EU) commercial banks". Abreu and Mendes (2001) also show that there is a positive impact of the equity level of a commercial bank on the financial performance of that bank. Goddard et al. (2004) supports the prior finding of a "positive relationship between capital/asset ratio and bank's earnings".

2.3.2 Asset Quality

The ratings of a financial institutions' Asset quality is based upon, but not limited to, an assessment of the following evaluation factors: the adequacy of underwriting standards, soundness of credit administration practices and appropriateness of risk identification practices, the level, distribution, severity, and trend of problem, classified, nonaccrual, restructured, delinquent, and nonperforming assets for both on- and off-balance sheet transactions, the adequacy of the allowance for loan and lease losses and other asset valuation reserves, the credit risk arising from or reduced by off-balance sheet transactions, such as unfunded commitments, credit derivatives, commercial and standby letters of credit, and lines of credit, the diversification and quality of the loan and investment portfolios (Ferrouhi, 2014).

Asset quality is an aspect of bank management entails the evaluation of a firm asset in order to facilitate the measurement of the level and size of credit risk associated with its operation. It relates to the left-hand side of a bank balance sheet and focused on the quality of loans

which provides earnings for a bank. Asset quality and loan quality are two terms with basically the same meaning while its management is considered extremely important by the banking sector. According to the BCBS, the core principles for effective banking supervision comprised twenty-five core principles out of which seven are designed to address the relevant issues of bank asset quality or credit risk management (Basle, 1997). This implied that asset quality is of general concern to financial supervisory authorities in every country throughout the world.

Streeter (2000) reported that asset quality management is considered one of banks major management problems in 2001 based on the self-administered questionnaires served to the members of American Bankers Association Board which composed of one-third of bank officials from all U.S. banks, the result of the above survey sufficiently proves that asset quality management is a common issue for bankers in practice. Similarly, Gene Miller (CEO of America Corp.) considered asset quality as the second most important management issue and formed a task force to specifically handle rising bad assets.

According to Achou and Tenguh (2008), non-performing loans (NPL) has an inverse relationship with banks' profitability. Hence, they suggested that it is of crucial importance that banks practice prudent credit risk management and safeguarding the assets of the banks and protect the investors' interests. Similarly, Aboagye and Otieku (2010) contended that for banks to continue operations; they must make enough money through lending and fiduciary activities or services to cover their operational and financing costs, plough back retained

earnings to finance future operations. This will enhance not only the survival but also their growth and profitability.

2.3.3 Management Quality

The management is rated upon different factors inter alia: the level and quality of oversight and support of all institution activities by the board of directors and management, the ability of the board of directors and management, in their respective roles, to plan for, and respond to, risks that may arise from changing business conditions or the initiation of new activities or products, the adequacy of, and conformance with, appropriate internal policies and controls addressing the operations and risks of significant activities, the accuracy, timeliness, and effectiveness of management information and risk monitoring systems appropriate for the institution's size, complexity, and risk profile, the adequacy of audits and internal controls to: promote effective operations and reliable financial and regulatory reporting; safeguard assets; and ensure compliance with laws, regulations, and internal policies (Ferrouhi, 2014).

Determinants of bank profitability can be split between those that are internal and those that are external. Internal determinants of bank profitability can be defined as those factors that are influenced by the bank’s management decisions and policy objectives. Management effects are the results of differences in bank management objectives, policies, decisions, and actions reflected in differences in bank operating results, including profitability. Zimmerman (1996) found that management decisions, especially regarding loan portfolio concentration, were an important contributing factor in bank performance. Researchers frequently attribute

good bank performance to quality management. Management quality is assessed in terms of senior officers' awareness and control of the bank's policies and performance.

Tsai and Huang (1999), by utilizing a translog cost function, examined the relationship between management quality and cost efficiency within Taiwan's banking industry. They discovered that asset quality and cost efficiency are related; the non-value-added activities of bad assets incur a negative consequence on the operating performance. According to Amel and Prager (2014) in a study on whether managers were important in community bank performance, the study revealed that the quality of bank management matters a great deal to profitability, especially during times of economic stress. Friebel and Schweiger (2012) investigated whether management quality explains firm performance in Russia. They found that it explains relatively little in terms of firm performance, but it does explain some of the differences between firms in Russia's Far East and the rest of Russia. While management practices may not yet affect firm performance in a measurable way, they may do so in the future.

2.3.4 Earnings Quality

Financial institution's earnings is rated upon different factors inter alia: the level of earnings, including trends and stability, the ability to provide for adequate capital through retained earnings, the quality and sources of earnings, the level of expenses in relation to operations, the adequacy of the budgeting systems, forecasting processes, and management information systems in general (Ferrouhi, 2014).

Various factors influence the performance of a bank and the earnings efficiency of a bank is of prime importance. Earnings quality and profitability reflect the sustainability and efficiency of a bank, and earning capacity of assets ensures the continuity of the profit - making process. If the assets or investments made by the bank are not yielding adequate return, they do not have a satisfactory earning capacity. Earnings quality ratios throw light on the profitability of the bank from the viewpoint of owners and its operating efficiency (Aloysius, 2014).

Prior et al., (2014) examined whether earnings quality affect performance of banks in Spain using a profit frontier approach and revealed that the impact of earnings management on profit efficiency is of less magnitude than what might a priori be expected.

2.3.5 Liquidity

Liquidity is rated based upon inter alia, these factors: the adequacy of liquidity sources compared to present and future needs and the ability of the institution to meet liquidity needs without adversely affecting its operations or condition, the availability of assets readily convertible to cash without undue loss, access to money markets and other sources of funding, the level of diversification of funding sources, both on- and off-balance sheet, the degree of reliance on short-term, volatile sources of funds, including borrowings and brokered deposits, to fund longer term assets, the trend and stability of deposits (Ferrouhi, 2014).

Liquidity of the commercial bank is also considered to have an influence on the financial performance of the bank. Researchers note that insufficient liquidity of commercial banks is considered to be one of the major reasons why they fail. It is however important to note that when a commercial bank holds a lot of liquid assets, then it incurs an opportunity cost of getting higher returns from investing with those assets. It is noted from the various studies that there is a positive relationship between liquidity and the performance of commercial banks although it is also noted that during times of instability in the business environment, commercial banks will tend to increase their cash reserves (holdings) as a way of mitigating themselves against risks. It is therefore clear that there is a negative correlation between the level of liquidity and the financial performance of commercial banks.

2.3.6 Sensitivity to Market Risk

Sensitivity to market risk is rated based upon, but not limited to, an assessment of the following evaluation factors: the sensitivity of the financial institution's earnings or the economic value of its capital to adverse changes in interest rates, foreign exchange rates, commodity prices, or equity prices, the ability of management to identify, measure, monitor, and control exposure to market risk given the institution's size, complexity, and risk profile, the nature and complexity of interest rate risk exposure arising from non-trading positions (Ferrouhi, 2014).

2.4 Empirical Review

The results on the impact of internet banking are conflicting. Egland et al. (1998) was the first important study, which estimated the number of US banks offering Internet banking and analyzed the structure and performance characteristics of these banks. It found no evidence

of major differences in the performance of the group of banks offering Internet banking activities compared to those that do not offer such services in terms of profitability, efficiency or credit quality. However, transactional Internet banks differed from other banks primarily by size.

In contrast to the results of Egland et al. (1998), Furst et al. (2000a, 2000b, 2002a and 2002b) found that banks in all size categories offering Internet banking were generally more profitable and tended to rely less heavily on traditional banking activities in comparison to non-Internet banks. An exception to the superior performance of Internet banks was the de novo (new start-ups) Internet banks, which were less profitable and less efficient than non-Internet de novos. The authors concluded that Internet banking was too small a factor to have affected banks' profitability. Sullivan (2000) found that click and mortar banks in the 10th Federal Reserve District incurred somewhat higher operating expenses but offset these expenses with somewhat higher fee income. On average, this study found no systematic evidence that banks were either helped or harmed by offering the Internet delivery channel. Similar to the results of Furst et al., this study also found that de novo click and mortar banks performed significantly worse than de novo brick and mortar banks.

Using information drawn from banks in Italy, Hasan et al. (2002) found that the Internet banking institutions were performing significantly better than the non-Internet groups. Additionally, the risk variables associated with the Internet group continued to be lower relative to the non-Internet group. The asset-liability variables revealed that on average the banks in this Internet group were larger and had significantly higher trading and investment

activities and less dependent on retail deposits (both demand and saving deposits) relative to the non-Internet group. The only category where the Internet group showed a lower performance was the noninterest expense category. It found a significant and positive link between offering of Internet banking activities and banks' profitability and a negative but marginally significant association between the adoption of Internet banking and bank risk levels particularly due to increased diversification.

Hernando and Nieto (2005) examined the performance of multichannel banks in Spain between 1994 and 2002. The study found higher profitability for multichannel banks through increased commission income, increased brokerage fees and (eventual) reductions in staffing levels and concluded that the Internet channel was a complement to physical banking channels. In contrast to earlier studies, the multichannel banks in Spain relied more on typical banking business (lending, deposit taking and securities trading). The adoption of the Internet as a delivery channel had a positive impact on banks' profitability after one and a half years of adoption. It was explained by the lower overhead expenses and in particular, staff and IT costs after the same period.

The study by Sathye (2005) investigated the impact of the introduction of transactional Internet banking on performance and risk profile of major credit unions in Australia. Similar to the results of Sullivan (2000), the Internet banking variable didn't show a significant association with the performance as well as with operating risk variable. Thus, Internet banking didn't prove to be a performance enhancing tool in the context of major credit unions in Australia. It neither reduced nor enhanced risk profile.

DeYoung et al. (2007) observed the change in financial performance of Internet community banks in U.S. during 1999-2001. The results found that Internet adoption improved community banks' profitability, particularly through increased revenues from deposit service charges. Internet adoption was also associated with movements of deposits from checking accounts to money market deposit accounts, increased use of brokered deposits and higher average wage rates for bank employees. It found little evidence of changes in loan portfolio mix. The findings suggested that Internet adoption was associated with an economically and statistically significant improvement in bank profitability.

Other studies by DeYoung (2001a, 2001b, 2001c and 2005) analyzed systematically the financial performance of pure-play Internet banks in U.S. The study found relatively lower profits at the Internet-only institutions than the branching banks, caused in part by high labour costs, low fee based revenues and difficulty in generating deposit funding. However, consistent with the standard Internet banking model, the results indicated that Internet-only banks tended to grow faster than traditional branching banks. Internet-only banks have access to deeper scale economies than branching banks and because of this, they are likely to become more financially competitive over time as they grow larger. Delgado et al. (2004 and 2007) found similar results for Internet-only banks in the EU. Nevertheless, the magnitude of technology based scale economies found in Delgado et al. (2004 and 2007) was substantially larger than that estimated by DeYoung studies.

Further, Malhotra and Sigh (2009) examined the impact of Internet banking on banks' performance and risk. The multiple regression results revealed that the profitability and

offering of Internet banking does not have any significant association. This contrasts the results by Uppal (2011) who noted that I-banking posed a positive impact on the profitability of the banks thus concluded that there was need of time to mitigate this risk.

Studies in Kenya have not linked directly internet banking risks and financial performance as they are generally on risk management practices of financial institutions. Kioko (2008) did a study on the credit risk management techniques of unsecured loans of Commercial Banks in Kenya. The study was a survey of various Commercial Banks. The study revealed that the Banks used a combination of credit management methods for unsecured loans. Further, Kipchichir (2008) did a study on foreign exchange risk management practices. The study was a survey of the motor vehicle industry in Kenya. The results revealed that the most commonly used foreign exchange risk management method was hedging.

In another study by Ngare (2008), credit risk management practices by commercial banks were sought. This was a survey of commercial banks in Kenya. The results revealed a combination of credit risk management methods used by commercial banks in Kenya. Njiru (2003) did a study on credit risk management by coffee cooperatives in Embu District. The study was a survey of coffee cooperatives in the area. The study revealed that the methods were similar to the ones commonly espoused in finance textbooks. Simiyu (2008) on the other hand sought to establish the credit risk management techniques in microfinance institutions in Kenya. The study design was survey of microfinance institutions in Nairobi. The study revealed that the methods did not differ from those of commercial banks. Lastly, Weru (2008) did an assessment of information systems risk management practices. This was

a case study. The study revealed that the organization used various information system risk management strategies as recommended by COSO framework.

2.5 Summary of the Literature Review

The evidence of the impact of the adoption of Internet as a delivery channel on financial performance is mixed. In the Kenyan context, many publications throw light over the importance of internet banking and also its prospects for the Kenyan banking industry. However these studies don't depict any empirical relationship between banks' profitability and Internet banking. For instance, Kioko (2008) and Ngare (2008) focused on credit risk management techniques of banks as Njiru (2003) examined credit risk management of coffee cooperatives and Simiyu (2008) focused on the microfinance institutions (MFIs). Further, Kipchichir (2008) focuses on foreign exchange risk management practices of banks while Weru (2008) focused on information systems risk management practices.

There is therefore an empirical gap on how internet banking risk management practices affect the financial performance of banks in Kenya. This is the gap addressed in the present study. This study seeks to establish whether banks in Kenya use the strategies laid down by the BCBS on e-banking risk management as well as other best practices as proposed by other scholars and how that affects their financial performance.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology. First, a presentation of the research design is provided. This is followed by an explanation on the target population, description of research instruments, description of sample and sampling procedures, description of data collection procedures and a description of data analysis procedures.

3.2 Research Design

This study adopted a descriptive study design. Descriptive research design is a design that is used when the researcher wants to describe specific behavior as it occurs in the environment (Greener, 2008). The aim of the study was to evaluate the effect of internet banking risk management strategies on the financial performance of banks in Kenya. According to Mugenda & Mugenda (2003) the purpose of descriptive research is to determine and report the way things are and it helps in establishing the current status of the population under study. Borg & Gall (1996) note that descriptive survey research is intended to produce statistical information about aspects of a study that interest policy makers.

3.3 Population

The population of this study was all the commercial banks in Kenya. According to the Central Bank of Kenta, there were 43 commercial banks by December 2014 (see appendix 1). These banks also made up the final sample size for the study. This was therefore a census survey.

3.4 Data Collection

Data was collected using primary sources and secondary sources. The primary data was collected using structured questionnaire. The questionnaire mainly addressed the second objective (risk management strategies) and were based on the guidelines offered by BCBS on e-banking risk management as well as from other scholars in this area. Secondary data was used to collect information on internet banking adoption and on the financial performance of banks. A questionnaire is provided as appendix 2. The research instruments was self-administered. The respondents were the risk managers in each of the banks. A three week period was given for the respondents to fill in the questionnaires after which they were collected for analysis.

The data on financial performance (net profits, total assets, and equity) was sought from the financial statements of respective banks. Other financial data (total loans, non-interest expense, net interest income, non-interest income, non-performing assets, net advances, total interest income, and interest expense) were also sought from the financial statements to compute the control variables. The data was collected for a five year period from 2010 to 2014 as all banks currently have their annual reports up to 2014.

3.4.1 Data Validity and Reliability

Reliability of the scale was tested using Cronbach's alpha and interpreted accordingly. Validity of the questionnaire was pre-tested using a sample of 5 banks. The outcome of the pre-test was used to amend the questionnaire accordingly before final administration to the sampled banks.

3.5 Data Analysis

The effect of internet banking risk management on performance was analysed using multiple regression analysis. The dependent variable was performance measures (ROA) while the independent variable was internet banking risk management which was measured using the mean scores from the questionnaires from each of the banks. A number of control variables waere used as shown in Table 3.1.

3.5.1 Analytical Model

The following model was used in the analysis.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_2 X_3 + \beta_2 X_4 + \beta_2 X_5 + \beta_2 X_6 + \pi \quad \text{..... Equation 1}$$

Table 3.1: Description of variables affecting bank performance

Symbol	Definition	Measurement	Source of Data
Y	Financial performance	Net Income/Total Assets	2010-2014 annual reports
X_1	Internet risk management strategies (sensitivity to market risk)	Mean scores from Likert Scale (1-5)	Questionnaire
X_2	Capital Adequacy	Total Debt/Total Equity	2010-2014 annual reports
X_3	Asset Quality	NPL/Total Loans	2010-2014 annual reports
X_4	Management Quality	Net Income/Total Equity	2010-2014 annual reports
X_5	Earnings Quality	Net profit margin	2010-2014 annual reports
X_6	Liquidity	Deposits/Total Assets	2010-2014 annual reports

Source: Researcher

Given that this was a multiple regression analysis, Pearson correlation was used to analyze correlations among the independent variables. Any correlation coefficient exceeding 0.8 indicates a potential problem of multicollinearity (Anderson et al., 1990).

3.5.2 Test of Significance

The ordinary least squares (OLS) was used to test the model above. Results were interpreted based on the resultant R, R^2, adjusted R^2, t-values and the significance of the F statistic for each of the variables in the model. These results were presented in tables. The SPSS version 22 was used to code and enter primary data as well as perform the entire data analysis.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the results of the study. The chapter is organized as follows: the next section presents the descriptive results. This is followed by the correlation analysis results. The regression analysis results follow. Finally, a discussion of findings is presented.

4.2 Descriptive Statistics

The results in Table 4.1 show that the most significant aspect of internet risk management practice for banks was that the banks had taken appropriate measures to authenticate the identity and authorization of customers with whom they conduct business over the internet (mean = 4.9, SD = 0.304). The results show that the board of directors and senior management review and approve the key aspects of the banks' security control process (mean = 4.6, SD = 0.496). The results also revealed that the banks use transaction authentication methods that promote non-repudiation and establish accountability for internet banking transactions (mean = 4.60, SD = 0.672).

The study found that the board of directors and senior management established effective management oversight over the risks associated with internet banking activities (mean = 4.50, SD = 0.506). It was noted that the banks ensure that appropriate measures are in place to protect data integrity of internet banking transactions, records and information (mean = 4.50, SD = 0.679). The results also showed that the banks ensure that proper authorization controls and access privileges are in place for internet banking systems, databases and applications (mean = 4.50, SD = 0.928).

Table 4.1: Descriptive statistics for internet banking risk management practices

	Mean	SD
The bank has taken appropriate measures to authenticate the identity and authorization of customers with whom it conducts business over the Internet.	4.9000	.30382
The Board of Directors and senior management review and approve the key aspects of the bank's security control process	4.6000	.49614
The bank uses transaction authentication methods that promote non-repudiation and establish accountability for internet banking transactions.	4.6000	.67178
The Board of Directors and senior management established effective management oversight over the risks associated with internet banking activities	4.5000	.50637
The bank ensures that appropriate measures are in place to protect the data integrity of internet banking transactions, records and information.	4.5000	.67937
The bank ensures that proper authorization controls and access privileges are in place for internet banking systems, databases and applications.	4.4000	.92819
The bank ensures that clear audit trails exist for all internet banking transactions.	4.4000	.67178
The bank takes appropriate measures to preserve the confidentiality of key internet banking information.	4.3000	.79097
The bank takes appropriate measures to ensure adherence to customer privacy requirements applicable to the jurisdictions to which the bank is providing internet banking products and services.	4.3000	.64847
The Board of Directors and senior management has established a comprehensive and ongoing due diligence and oversight process for managing the bank's outsourcing relationships and other third-party dependencies supporting internet banking.	4.0000	.90582
The bank ensures that adequate information is provided on their websites to allow potential customers to make an informed conclusion about the bank's identity and regulatory status of the bank prior to entering into internet banking transactions.	4.0000	1.19829
The bank has effective capacity, business continuity and contingency planning processes to help ensure the availability of internet banking systems and services.	3.8000	.88289
The bank developed appropriate incident response plans to manage, contain and minimise problems arising from unexpected events,	3.8000	.88289

including internal and external attacks, that may hamper the provision of internet banking systems and services.		
The bank ensures that appropriate measures are in place to promote adequate segregation of duties within internet banking systems, databases and applications	3.7000	1.11401

Source: Researcher Data (2015)

Table 4.2 shows the descriptive results for other internet banking risk management practices. The study found that other practices were use of access controls (mean = 4.60, SD = 0.672), review and monitoring of regulatory requirements (mean = 4.40, SD = 0.810), use of data back-ups and recovery tests (mean = 4.30, SD = 0.791), maintenance of security infrastructure (mean = 4.30, SD = 0.791), and investment in security infrastructure (mean = 4.20, SD = 0.992) among others.

Table 4.2: Descriptive statistics for other internet banking risk management practices

	Mean	SD
Use of access controls	4.6000	.67178
Review and monitoring of regulatory requirements	4.4000	.81019
Use of data back-ups and recovery tests	4.3000	.79097
Maintenance of security infrastructure	4.3000	.79097
Investment in security infrastructure	4.2000	.99228
Use of firewalls	4.0000	.78446
Performance of penetration tests	4.0000	1.01274
Ensuring consistency between internet banking product and strategic plan	4.0000	1.01274
Considering how connections to third parties are presented on the websites	3.5000	1.13228

Source: Researcher Data (2015)

Table 4.3 shows the summary descriptive results for the variables under study. As shown, the results show that financial performance as measured by return on assets averaged 2.28% with a standard deviation of 1.46%. Internet risk management practices had a mean of 4.27 suggesting that the practices were highly applied in the management of internet risk

management. Other internet banking risk management practices were also highly applied as they have a mean of 4.14. Capital adequacy averaged 33.46%, asset quality had a mean of 7.3%, management quality had a mean of 13.06%, earnings quality had a mean of 4.39% and liquidity had a mean of 78.14%.

Table 4.3: Summary descriptive statistics

	Mean	SD
Financial performance	.0228	.01460
Internet risk management practices	4.2714	.61449
Other internet risk management practices	4.1444	.70999
Capital adequacy	.3346	.55842
Asset quality	.0730	.06389
Management quality	.1306	.11578
Earnings quality	.0439	.03360
Liquidity	.7814	.09225

Source: Researcher Data (2015)

4.3 Inferential Statistics

This section presents the inferential statistics. The specific statistics presented are correlation statistics, tests of significance and regression analysis, and analysis of variance.

4.3.1 Correlation Analysis

The results in Table 4.4 show the correlation analysis results for the independent variables in the study. The results show that the two internet risk management practices were highly correlated (r = 0.912). The results also show that earnings quality and management quality were highly correlated (r = 0.792). A decision is made for a cut of decision to be 0.8. Thus, a correlation coefficient of 0.80 and above is considered intolerable for using the variables in the model. As such, the researcher deletes the second component of internet risk management practices from the regression model since both measured the same thing. However, both

earnings quality and management quality are retained in the model since the tolerance levels are not reached.

Table 4.4: Correlation matrix

	1	2	3	4	5	6
Internet risk management practices (1)	1					
Internet risk management practices (2)	.912**	1				
Capital adequacy (3)	-.157	-.136	1			
Asset quality (4)	.066	.143	.071	1		
Management quality (5)	.241	.247	-.372*	-.520**	1	
Earnings quality (6)	.242	.236	-.373*	-.537**	.792**	1
Liquidity (7)	-.044	-.138	-.280	-.274	.230	.290

Source: Researcher Data (2015)

4.3.2 Regression Model

Table 4.5 shows the regression analysis results. The study found that R^2 was 0.930 suggesting that 93% of the variance in performance was explained by the model. Thus, majority of the variance in the financial performance of commercial banks can be explained by this model.

Table 4.5: Summary regression model

R	R Square	Adjusted R Square	Std. Error of the Estimate
.964[a]	.930	.917	.00421

Source: Researcher Data (2015)

4.3.3 ANOVA

Table 4.6 shows the ANOVA results. The study found that the F-statistic of 72.576 is significant, p = 0.000. This shows that the model used is fit to explain the relationship between internet banking risk management practices and the financial performance of commercial banks in Kenya.

Table 4.6: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.008	6	.001	72.576	.000[b]
Residual	.001	33	.000		
Total	.008	39			

Source: Researcher Data (2015)

4.3.4 Tests of Significance

Table 4.7 shows the coefficient results of the regression analysis. The results show that internet banking risk management practices had a positive but insignificant effect on financial performance (β = .000, p = .820). The study found that capital adequacy had a positive but insignificant effect on financial performance (β = .000, p = .925). The study also revealed that asset quality had a positive but insignificant effect on the financial performance (β = .009, p = .531). The results showed that management quality had a positive and significant effect on the performance of commercial banks (β = .075, p = .000). It was revealed that earnings quality had a positive and significant effect on the financial performance of banks (β = .227, p = .000). The further found that liquidity had a negative but insignificant effect on the financial performance of banks in Kenya (β = -0.011, p = .165).

Table 4.7: Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	.009	.008		1.063	.296
IRMP	.000	.001	.011	.229	.820
Capital adequacy	.000	.001	-.005	-.095	.925
Asset quality	.009	.014	.038	.634	.531
Management quality	.075	.011	.531	6.731	.000
Earnings quality	.227	.035	.522	6.474	.000
Liquidity	-.011	.008	-.072	-1.420	.165

Source: Researcher Data (2015)

4.4 Interpretation of Findings

The study sought to examine the effect of internet banking risk management practices on the performance of commercial banks in Kenya. The study found that internet banking risk management practices had a positive but insignificant effect on the financial performance of banks. This is consistent with Sathye (2005) who revealed that the internet banking variable didn't show a significant association with the performance.

The study also examined the effect of capital adequacy on the financial performance of commercial banks in Kenya. The results showed that capital adequacy had a positive but insignificant effect on the financial performance. In terms of the nature of the relationship, these results are consistent with Goddard et al. (2004) who supported the finding of a positive relationship between capital/asset ratio and bank's earnings.

The study further examined the effect of asset quality on the financial performance of commercial banks in Kenya. The study found that asset quality had a positive but insignificant effect on the performance of banks. This is inconsistent with the findings of Achou and Tenguh (2008) who revealed that asset quality had an inverse relationship with banks' profitability.

The study also examined the effect of management quality on the financial performance of commercial banks in Kenya. The results showed that management quality had a positive and significant effect on the financial performance of commercial banks. The results are

consistent with Friebel and Schweiger (2012) who found that management quality had some effect on firm performance in Russia.

The study examined the effect of earnings quality on the financial performance of commercial banks in Kenya. The results revealed that earnings quality had a positive and significant effect on the financial performance of commercial banks. This is consistent with the findings of Prior et al., (2014) who found that earnings management had an effect on the performance of banks in Spain.

Finally, the study examined the effect of liquidity on the financial performance of commercial banks in Kenya. The results showed that liquidity had a negative but insignificant effect on the performance of banks. This is inconsistent with the findings of Ferrouhi (2014) who found a significant impact of liquidity on the financial performance of banks.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is organised as follows: the next section presents the summary of research findings. This is followed by the conclusions of the study and the limitations of the study. Then, the recommendations for policy and practice are presented. Finally, suggestions for further research are made.

5.2 Summary

The study sought to examine the effect of internet banking risk management practices on the financial performance of commercial banks in Kenya. The descriptive results showed that financial performance as measured by return on assets averaged 2.28% with a standard deviation of 1.46%. Internet risk management practices had a mean of 4.27 suggesting that the practices were highly applied in the management of internet risk management. Other internet banking risk management practices were also highly applied as they have a mean of 4.14. Capital adequacy averaged 33.46%, asset quality had a mean of 7.3%, management quality had a mean of 13.06%, earnings quality had a mean of 4.39% and liquidity had a mean of 78.14%.

The correlation analysis results showed that the two internet risk management practices were highly correlated (r = 0.912). The results also showed that earnings quality and management quality were highly correlated (r = 0.792). There was serial collinearity between the two internet risk management practices variables and, therefore, one of them was dropped. The regression analysis results showed that 93% of the variance in performance was explained by

the model. The ANOVA results showed that the F-statistic of 72.576 was significant, p = 0.000 suggesting that the model was fit to explain the relationship between internet banking risk management practices and the financial performance of commercial banks in Kenya.

The regression coefficients showed that internet banking risk management practices had a positive but insignificant effect on financial performance (β = .000, p = .820). The study found that capital adequacy had a positive but insignificant effect on financial performance (β = .000, p = .925). The study also revealed that asset quality had a positive but insignificant effect on the financial performance (β = .009, p = .531). The results showed that management quality had a positive and significant effect on the performance of commercial banks (β = .075, p = .000). It was revealed that earnings quality had a positive and significant effect on the financial performance of banks (β = .227, p = .000). The further found that liquidity had a negative but insignificant effect on the financial performance of banks in Kenya (β = -0.011, p = .165).

5.3 Conclusions

The study sought to examine the effect of internet banking risk management practices on the performance of commercial banks in Kenya. The study found that internet banking risk management practices had a positive but insignificant effect on the financial performance of banks. It is concluded that internet banking risk management does not influence the performance of commercial banks in Kenya.

The study also examined the effect of capital adequacy on the financial performance of commercial banks in Kenya. The results showed that capital adequacy had a positive but

insignificant effect on the financial performance. This leads to the conclusion that capital adequacy does not influence the financial performance of commercial banks in Kenya.

The study further examined the effect of asset quality on the financial performance of commercial banks in Kenya. The study found that asset quality had a positive but insignificant effect on the performance of banks. The study therefore concludes that asset quality does not influence the financial performance of commercial banks in Kenya.

The study also examined the effect of management quality on the financial performance of commercial banks in Kenya. The results showed that management quality had a positive and significant effect on the financial performance of commercial banks. This study therefore concludes that management quality affects the financial performance of commercial banks in Kenya.

The study examined the effect of earnings quality on the financial performance of commercial banks in Kenya. The results revealed that earnings quality had a positive and significant effect on the financial performance of commercial banks. The study concludes that the financial performance of commercial banks in Kenya is influenced by the earnings ability of banks.

Finally, the study examined the effect of liquidity on the financial performance of commercial banks in Kenya. The results showed that liquidity had a negative but

insignificant effect on the performance of banks. This leads to the conclusion that the financial performance of commercial banks in Kenya is not influenced by liquidity.

5.4 Recommendations for Policy and Practice

The study makes a number of recommendations. First, the study recommends that while this study did not find any significant effect of internet banking risk management practices on the performance of banks, commercial banks should invest in better interest risk management practices in order to reduce risks and, therefore, curb fraud through internet banking.

Secondly, the study recommends that the Central Bank of Kenya as the regulator of commercial banks should conduct risk audits that focus on internet banking risk management practices and report on the findings in order to alert the management on the areas of weaknesses that need further work.

Lastly, the study recommends that bank customers should be vigilant on what measures their banks have put in place to manage risks. More specifically, they should question the measures their banks have in place to manage internet banking risks especially for those who do internet banking.

5.5 Limitations of the Study

This study was focused on the commercial banks alone. The other financial institutions such as microfinance institutions, savings and credit cooperative societies and insurance firms were not part of the study. Thus, the results may not be generalizable to all financial institutions in Kenya.

The study also focused only on the management of internet banking risks. Thus, as much as banks face other risks other than internet risks, they were not part of this study. Therefore, this limits the application of these results to all classes of bank risks. The interpretation of these findings should therefore take note of the conceptual scope of the study.

The measure of internet banking risk management practices used in this study was based on primary data while the rest of the variables were based on secondary data. While this is one of the strengths of the study where a combination of data sources is used, the use of primary data for internet banking risk management practices is a major limitation as most of the respondents tended to have a positive bias by reporting that they were doing well in managing internet risks.

5.6 Suggestions for Further Research

Further studies on the effect of internet banking risk management practices are needed and should expand the scope to include all financial institutions that face internet banking risks. This way, the results will be generalizable to a wider population and will be more relevant to all financial institutions in Kenya.

The study suggests that future studies include other banking risks in the model in order to test, in general, how the management of each class of risk influences the financial performance of commercial banks in Kenya. This will provide a comprehensive analysis of how management of bank risks affect the overall financial performance of banks.

This study also recommends that future studies in this area should either use observational data on internet banking risk management practices or secondary data from bank reports on how they are managing internet banking risks. This will provide a basis of validating the self-reported responses on how the banks are managing internet banking risks.

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APPENDICES

Appendix I:Commercial Banks in Kenya by December 2014

1. African Banking Corporation
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. CFC Stanbic Bank
7. Charterhouse Bank
8. Chase Bank
9. Citibank N.A. Kenya
10. Commercial Bank of Africa
11. Consolidated Bank of Kenya
12. Co-operative Bank of Kenya
13. Credit Bank
14. Development Bank of Kenya
15. Diamond Trust Bank Kenya
16. Dubai Bank Kenya
17. Ecobank Kenya
18. Equatorial Commercial Bank
19. Equity Bank
20. Family Bank
21. Fidelity Commercial Bank
22. Fina Bank
23. First Community Bank
24. Giro Commercial Bank
25. Guardian Bank
26. Gulf African Bank
27. Habib Bank A.G. Zurich
28. Habib Bank
29. Imperial Bank

30. I&M Bank
31. Jamii Bora Bank
32. Kenya Commercial Bank
33. K-Rep Bank
34. Middle East Bank
35. National Bank of Kenya
36. NIC Bank
37. Oriental Commercial Bank
38. Paramount Universal Bank
39. Prime Bank
40. Standard Chartered Bank Kenya
41. Trans-National Bank
42. UBA Kenya Bank
43. Victoria Commercial Bank

Source: Central Bank of Kenya (2015)

Appendix II: Research Questionnaire

Section A: Internet Banking Risk Management

The following statements refer to the management of risk related to internet banking in your bank. State the extent to which you agree with each of the statements as far as your bank is concerned.

Key:

Strongly disagree = 1

Disagree = 2

Neutral = 3

Agree = 4

Strongly agree = 5

Statement	1	2	3	4	5
1. The Board of Directors and senior management established effective management oversight over the risks associated with internet banking activities					
2. The Board of Directors and senior management review and approve the key aspects of the bank's security control process					
3. The Board of Directors and senior management has established a comprehensive and ongoing due diligence and oversight process for managing the bank's outsourcing relationships and other third-party dependencies supporting internet banking.					
4. The bank has taken appropriate measures to authenticate the identity and authorization of customers with whom it conducts business over the Internet.					
5. The bank uses transaction authentication methods that promote non-repudiation and establish accountability for internet banking transactions.					
6. The bank ensures that appropriate measures are in place to promote 7. adequate segregation of duties within internet banking systems, databases and applications					
8. The bank ensures that proper authorization controls and access privileges are in place for internet banking systems, databases and applications.					
9. The bank ensures that appropriate measures are in place to protect the data integrity of internet banking transactions, records and information.					
10. The bank ensures that clear audit trails exist for all internet banking transactions.					
11. The bank takes appropriate measures to preserve the confidentiality of key internet banking information.					

12. The bank ensures that adequate information is provided on their websites to allow potential customers to make an informed conclusion about the bank's identity and regulatory status of the bank prior to entering into internet banking transactions.					
13. The bank takes appropriate measures to ensure adherence to customer privacy requirements applicable to the jurisdictions to which the bank is providing internet banking products and services.					
14. The bank has effective capacity, business continuity and contingency planning processes to help ensure the availability of internet banking systems and services.					
15. The bank developed appropriate incident response plans to manage, contain and minimise problems arising from unexpected events, including internal and external attacks, that may hamper the provision of internet banking systems and services.					

Section B: Other Strategies of Managing Internet Banking Risks

The following statements relate to other ways in which the bank has managed risks related to internet banking. State the extent to which you agree with each of the statements as concerns your bank.

Key:

Strongly disagree = 1

Disagree = 2

Neutral = 3

Agree = 4

Strongly agree = 5

Statement	**1**	**2**	**3**	**4**	**5**
1. Use of access controls					
2. Use of firewalls					
3. Investment in security infrastructure					
4. Performance of penetration tests					
5. Use of data back-ups and recovery tests					
6. Maintenance of security infrastructure					
7. Review and monitoring of regulatory requirements					
8. Ensuring consistency between internet banking product and strategic plan					
9. Considering how connections to third parties are presented on the websites					

Thank you for participation

Appendix III: Internet Risk Management Practices & Performance Data

	IRMP	IRMP_OTHER	PERFORMANCE	CAPITAL ADEQUACY
KCB	4.86	5	0.04	0.15
Barclays	4.21	3.89	0.05	0.16
Co op	5	4.89	0.03	0.18
Equity	4.43	4	0.06	0.5
Stan Chart	4.43	4	0.04	0.03
CfC	4.36	4.11	0.02	0.52
Citibank	4.5	5	0.04	0.03
I&M	4.07	3.67	0.04	0.33
NBK	2.64	2.56	0.02	0
NIC	4.21	4.33	0.03	0.22
DTB	4.86	5	0.03	0.25
CBA	4.21	3.89	0.03	0.08
BOB	5	4.89	0.03	0
BOI	4.43	4	0.03	0
BOA	4.43	4	0.01	0.31
Prime	4.36	4.11	0.03	0
Imperial	4.5	5	0.04	0
Family	4.07	3.67	0.02	0.21
Ecobank	2.64	2.56	-0.01	2.34
Chase	4.21	4.33	0.02	0.54
Housing	4.86	5	0.02	1.74
Trans	4.21	3.89	0.02	0
ABC	5	4.89	0.02	0.25
Giro	4.43	4	0.03	0
DBK	4.43	4	0.01	1.57
Fina	4.36	4.11	0.01	1.71
K-Rep	4.5	5	0.02	0.66
Gulf	4.07	3.67	0.01	0.02
Victoria	2.64	2.56	0.03	0.32
Habib AG	4.21	4.33	0.02	0.09
Oriental	4.86	5	0.02	0
Guardian	4.21	3.89	0.02	0
Middle	5	4.89	0.03	0
Equatorial	4.43	4	-0.01	0.19
Habib	4.43	4	0.03	0
Consolidated	4.36	4.11	0	0.93
Paramount	4.5	5	0.02	0
Credit	4.07	3.67	0.01	0
Fidelity	2.64	2.56	0.02	0
Jamii Bora	4.21	4.33	-0.01	0.08

Source: Researcher Data (2015)

Appendix IV: Performance Data

	ASSET QUALITY	MANAGEMENT QUALITY	EARNINGS QUALITY	LIQUIDITY
KCB	0.06	0.21	0.06	0.78
Barclays	0.11	0.28	0.08	0.85
Co op	0.07	0.23	0.09	0.81
Equity	0.04	0.3	0.09	0.7
Stan Chart	0.03	0.27	0.08	0.79
CfC	0.02	0.19	0.05	0.76
Citibank	0.01	0.18	0.12	0.72
I&M	0.02	0.21	0.06	0.74
NBK	0.08	0.12	0.04	0.84
NIC	0.04	0.21	0.05	0.8
DTB	0.01	0.19	0.05	0.78
CBA	0.04	0.23	0.05	0.86
BOB	0.03	0.24	0.07	0.85
BOI	0.02	0.17	0.08	0.84
BOA	0.03	0.08	0.02	0.8
Prime	0.03	0.22	0.05	0.87
Imperial	0.05	0.31	0.07	0.85
Family	0.09	0.14	0.04	0.8
Ecobank	0.11	-0.14	-0.02	0.69
Chase	0.03	0.2	0.04	0.83
Housing	0.07	0.13	0.02	0.63
Trans	0.07	0.1	0.05	0.74
ABC	0.04	0.18	0.04	0.82
Giro	0.02	0.21	0.06	0.85
DBK	0.14	0.08	0.02	0.63
Fina	0.05	0.1	0.03	0.9
K-Rep	0.12	0.14	0.03	0.72
Gulf	0.05	0.1	0.02	0.85
Victoria	0	0.18	0.06	0.76
Habib AG	0.03	0.11	0.07	0.64
Oriental	0.11	0.09	0.04	0.77
Guardian	0.09	0.13	0.02	0.87
Middle	0.22	0.11	0.05	0.76
Equatorial	0.15	-0.19	-0.02	0.89
Habib	0.04	0.18	0.08	0.79
Consolidated	0.14	0.01	0	0.78
Paramount	0.29	0.1	0.04	0.83
Credit	0.11	0.02	0.01	0.8
Fidelity	0.08	0.18	0.03	0.89
Jamii Bora	0.23	-0.01	-0.06	0.4

Source: Researcher Data (2015)