

**THE EFFECT OF SYSTEMIC RISK AND FINANCIAL CONTAGION IN
THE KENYAN BANKING SECTOR**

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

2019

DECLARATION

I, the undersigned, declare that this research project is my original work and has never been presented in any other University or College for a degree or any other award.

Signed.....

Date.....

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D61/5354/2017

Supervisor's Approval

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

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DEDICATION

I dedicate this research to my parents, Mr. Paul Kerioh (Deceased) and Mrs. Isabella Bosibori, who laboured to give me a good education. I love you eternally.

ACKNOWLEDGMENT

A number of individuals contributed to the writing of this work. Their contribution ranges from academic works written by them to the guidance and encouragement offered in making this dissertation a success. I won't be able to acknowledge all the individuals here but just to let them know that I am really grateful for the help they have offered me.

To single out a few; I would like to thank my supervisor Dr. Duncan Elly for the help and guidance he offered me in making this dissertation a success, Dr. Winnie Nyamute for moderating my research proposal and Professor Mirrie Mwangi for his approval as Chairman of the Department of Finance and Accounting. To Mr. Lampart Job and Wallace Kadima for their meticulous guidance that contributed to a better and more refined study.

Lastly, I would like to thank my wife, Florence Bosire, family members and friends for their encouragement and understanding, which in the end contributed to the successful completion of my MBA.

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LIST ABBREVIATIONS

CIR	Cost Income Ratio
EBIT	Earnings Before Interest and Tax
EBT	Earnings Before Tax
NPLs	Non-Performing Loans
ROA	Return on Assets
ROE	Return on Equity
TSCS	Time Series Cross-sectional Data

ABSTRACT

The intent of study was to understand the effect of systemic risk and financial contagion in the Kenyan banking sector since the year 1988 to 2018. Further, the study sought to make recommendations to mitigate contagion and increase preparedness to systemic risk in the Kenyan banking sector. The study analysed secondary data from Central Bank supervision reports for all commercial banks in Kenya for a period of 30 years starting from 1988 stretching to 2018 with a 5 year short term segmentation period. Through financial ratio analysis banks failures were analysed into short term time periods with correlation analysis used to see if past risk of bank failures led to present time failures. The study also adopted financial ratio analysis and panel data techniques to process and analyse the data. The study concludes that systemic risk and financial contagion has been the cause of 70% of the total 28 banking failures in the country for the last 30 years. The only problem with this type of risk unlike other major risk like Liquidity risk, Credit risk and Market risk; there exist no appropriate methodology that can be used to mitigate such risk and when it occurs, it's usually after a build-up of so many factors in the past. The study therefore recommends that the 25% minimum cap that was placed to limit how much banks should lend to a single individual should be further lowered to around 15%. Further there should be a cap limit to how much banks in different Tiers can lend, this will rein in to the behaviour of small banks over exposing their lending portfolios.

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

The banking sector has suffered various disruptions in the past that have affected multiple of banks across the globe simultaneously. These disruptions emerge from systemic risks that often start with one specific bank but spread very quickly across the other banks within and outside the region while impacting on their financial stability. Systemic risk is the instability created by the failure or collapse of a financial system while contagion is how this instability or failure is spread among different intermediaries. Financial contagion is aided by the interconnectedness of the financial sector. There has been occurrences of financial instabilities in the recent years, the most notable being the 2007 crisis. This has put to the fore systemic risks and financial contagion as major threats to financial stability in the banking sector. The accelerated growth and increase of international banking activity has created the emergence of ‘too big and too interconnected hence too important banks’ within the banking sector thus widening the scope of the complexity of the triggers of systemic risks and financial contagion in the banking sector. The study is trying to understand the basis of systemic risks and how the shock from these risks propagates quickly to other financial intermediaries.

The study was guided by the Moral hazard theory, the too big to fail theory, Modigliani-Miller theory and contagion theory. The moral hazard theory discusses about too much risk taking without regard to the consequences. The ever increasing focus on profitability by banks pushes management to engage in highly risky ventures without due regard to the possibilities of losses that may follow in-case of failure of those ventures.

The magnitude of some of these losses may result into bank failure or serious liquidity crunch. Too big to fail theory talks of the institutions that have grown too deeply into the economy that they cannot be let to fail by the Government. Big banks have been seen to compromise market discipline and any measure of micro shock to such banks will expose the entire financial industry to unknown levels of systemic exposure. This is the main reason why Governments bailout such institutions to stem a meltdown of the financial sector. M& M theory talks about leveraging of financial institutions focusing on how financial institutions borrow and or lend beyond their capacity. Debt is considered good for growth but only up to a certain threshold beyond which excess debt may expose the bank or banks to susceptibility of macro shocks. The contagion theory discusses about how financial shocks spread from one region to the other with devastating impact on the banking industry Allen and Gale (2000). Contagion of financial stress is aided by interconnectedness of financial institutions.

As noted by IOSCO (2009), Global market interconnectedness has always been cited as the first culprit whenever cries of financial distress creates chaos in a country's economy especially the banking sector and nothing captures this theory better than the recently witnessed 2008 financial crisis: but it should be noted that, most systemic failures in a country's financial system is as a result of weak policies from the domestic level that govern how banks administer credit supply and access to cash flow. Venezuela banking crisis of 1994 is a perfect example of how weak institutional policies can hamper an entire sector and the economy at large. The collapse of Banco Latino as result of liquidity strains emanating from unregulated advancement of credit led to more than 17 banks in Venezuela needing financial bailout in a span of one-year Krivoy (2000). Kenyan

banking sector also experienced its first financial breakdown similar to Venezuela banking crisis in the late 80's stretching to the 90's that culminated to the fall of 37 banks in the country as a result of poor handling of non-performing loans (Kithinji and Waweru 2007; Ngugi 2001).

1.1.1 Systemic Risk

Bethulomen and Whalen (1995), defined systemic risk as a Micro-shock that has the capacity to create a series of negative externalities that spills over to an entire sector or economy. Kaufman and Scott (2003) based their definition on the failure of a single institution having a financial breakdown and with it affecting other interlinked financial intermediaries hence creating a domino effect collapse of the entire financial system. This definition was also shared and reinforced by the Federal Reserve System (2001). Perhaps the most notable explanation that attempted to define simply yet definitive what systemic risk is was by Fouque and Langsam (2013), when they stated that systemic risk is a risk that emanates from a macro shock with a capability of triggering instability in the financial sector.

Though ambiguous is the definition of systemic risk by various scholars and academics, one thing that stands out from the collection of definition is that; systemic risk, is a risk that emanates from the instability or failure of the institutions in the financial system with the probability of collapsing the entire financial sector as well as the entire economy.

The fall of Imperial bank in 2015 created a squeeze in liquidity in the banking sector that greatly affected tier 2 and tier 3 banks in the country that did not have sufficient capital cover to weather the storm as a result Chase bank and Dubai bank dint take long to

collapse months after Imperial bank was put under receivership. Systemic risk is therefore devastating if left unchecked and hence the reason for this study.

The scope of the study will look at the emergence of systemic risk from three perspectives; Moral Hazard, Too big to fail and Overleveraging. These three variables may trigger fatal systemic risks in the Banking sector depending on the decisions made around them.

1.1.2 Financial Contagion

The shared understanding among scholars of both Economic and Finance literature is that financial contagion can be defined as the spread or spill over of negative externalities emanating from a financial crisis. Financial contagion can be defined in a broader view taking into account the global aspect of financial interlinkages as captured by Gajurel (2015), where she explained the term by looking at the spread of; Asian banking Crisis in the early 90's, the Latin America crisis in 90s and lastly the recent Global Financial Crisis in 2008. Through all these, the negative externalities resulting from financial distress from one country was spread to other countries due to the interconnectedness of financial intermediaries that was been enabled by the globalisation of capital markets across the globe. Financial contagion is aided by the interconnectedness of the financial sector. The accelerated growth and increase of international banking activity has created the emergence of 'too big and too interconnected hence too important banks' within the banking sector.

The term can also be defined by solely focusing on the spill over effects in the domestic economy. Krivoy (2000) expressed this point well when describing the Venezuela banking crisis of 1994. Within a period of less than 12 months, the collapse of one bank

Banco Latino led to a domino effect collapse of half of the banks in the Venezuelan economy. The domestic trickle-down effects of negative externalities were also experienced in the Kenyan banking sector with the collapse of Imperial Bank. The fall of Imperial bank created a squeeze in liquidity in the banking sector that greatly affected tier 2 and tier 3 banks in the country that did not have sufficient capital cover to weather the storm as a result Chase bank and Dubai bank did not take long to collapse months after Imperial bank was put under receivership.

Financial contagion is complementary to systematic risk. It is from contagion that we get the spread of a macro risk from an exposed institution A to a healthy institution B. Financial contagion is a bridge that facilitates the flow and spread of risk in the entire sector. The study focuses on analysing the enablers of financial contagion in the banking sector and make recommendations to mitigate spread of systemic risk. This analysis will focus on the interconnectedness of the banking sector in Kenya.

1.1.3 Systemic Risk and Financial Contagion

These two concepts are perfect complements of each other where there can hardly be an attempt to describe one concept without making reference to the other concept. Systemic risk is the instability created by the failure or collapse of a financial system while contagion is how this instability or failure is spread among different intermediaries. Without the failure there can never be the spread of negative externalities and in the same breath it's from the propagation of risk from one financial intermediary to another that makes systemic risk a reared concept in finance. Whereas these two concepts can be defined independently it's only when they are both defined as one concept that they tend to have a strong meaning. According to Krivor (2000), in Venezuela the collapse of

Banco Latino as a result of liquidity strains arising out of unregulated advancement of credit led to more than 17 banks in need of Government bailout within a period of one year. The same scenario happened in Kenya according to Kithinji and Waweru (2007) and Ngugi (2001). A total of 37 banks collapsed between the late 80's stretching to the 90's in Kenya as a result of poor handling of non-performing loans. The domino effect was spread through the interconnectedness and dependency on the Venezuela banking sector.

1.1.4 Banking Sector in Kenya

Globally most Central banks have struggled in dealing with financial market distress resulting from systemic risk and how the spread from these negative externalities propagate quickly from one financial intermediary to the next enough to cripple an entire banking sector. This has further been advanced by the complexity of the modern financial systems which has created a challenge for regulators to establish adequate indicators on how to objectively assess systemic risk. As it was observed in the recent 2008 financial crisis; it was only after the credit risk problem was at its advanced stage that regulators and financial players realised the gravity of the problem they were faced with, Singh (2010).

In Kenya, banks such as Continental Credit Finance Limited and Continental Bank of Kenya limited collapsed in 1986. In 1987, Capital finance Limited and other banks also collapsed. All the collapsed banks came together to form Consolidated Bank in 1989. A further 13 banks collapsed in 1993 with an additional 5 collapsing between 1996 and 1999. In the year 1999, Trust bank collapsed due to insider lending to shareholders and directors.

Though, the severity of systemic risk and financial contagion hasn't been experienced in the Kenya banking sector as it has been observed in other major economies. The few times the country's banking sector has faced the risk it has created a confusion like none before, leaving the sector very exposed as it was recently observed by the 2015 collapse of Chase bank and the 1989 fail of more than 37 banks due to poor banking policies and regulatory structures, Kithinji and Waweru (2007) and Ngugi (2001).

1.2 Research Problem

Most contemporary risk assessment and policies by Central banks have been centred on the importance of mitigating systemic risk and how to contain the spread of risk among financial intermediaries. As witnessed in the most recent Global recession of 2008; systemic risk has the potential to create catastrophic effects in the banking sector which in turn can spill over to the entire economy. Understanding how best to mitigate systemic risk and creating adequate measures in form of banking policies can help save the economy the growth stagnation created by the collapse of financial institutions as well as the job losses that will be witnessed when these financial intermediaries collapse.

The recently introduced Basel III Accord that aims to aide banks in strengthening and effectively regulating risk management along with the newly introduced accounting policy IFRS 9 that helps banks to profile high risk credit; shows the extent of how serious the concept of systemic risk is being addressed by the international regulators framework of banks. The domino effect created worldwide by the crippling of the USA financial institutions is a fate that no regulator wants to experience; since it plunged the world to a period of growth stagnation, job losses and decreased economic performance.

Majority of African Banking sectors are reliant on domestic deposits and lending and are insulated from foreign finance. Financial sectors in Sub-Saharan Africa are prone to systemic risk although. For instance, South Africa experienced a bank crisis between the period 2002 and 2003. The bank of Saambou collapsed in February 2002 triggering failure of a series of bank runs that resulted to the collapse of the fifth largest bank. By the end of 2003, 22 banks had collapsed due to a liquidity crisis that emerged from the collapse of Saambou bank.

Most studies done on systemic risk and financial contagion have centred their case studies on developed and by extension emerging countries with very limited case studies done on the impact of the same to developing countries like Kenya. Though most developing countries banking sector like Kenya are not highly interconnected to the levels of developed countries; the impact from the shocks of systemic risk will hamper these economies as it would developed countries hence its prudent that more studies should be done to help developing countries mitigate the risk of financial instability that emanates from this risk. As it was witnessed in the 2015 with the collapse of tier 2 banks; it only takes the fall of one institution to create havoc to the entire financial sector even if the institution is not large enough as it was the case of Imperial bank and Dubai bank. Most studies done locally have focused their attentions on trying to explain systemic risk with regards to how they affect banks financial performance as it was in the case of; Namasake (2015), Maniagi (2018), Maloba (2015). The closest case study that tried to capture systemic risk on the Kenyan banking sector was done by Analia and Gao (2018) but even them they failed to appreciate the impact of financial contagion in advancing

systemic risk. This study aims to focus its case on; how does systemic risk and financial contagion impact the banking sector in Kenya?

1.3 Research Objective

The intent of this study is to investigate the impact of systemic risk and financial contagion on the entire Kenyan banking sector.

1.4 Value of the Study

Bank failure caused massive economic losses and risked collapse of the banking sector.

The study therefore was timely in understanding the mutating effects of systemic risks and financial contagion in the banking sector.

The ever increasing interconnectedness and dependency in the global banking sector widened the scope and complexity of systemic risks. The study was valuable therefore in advising on the impact of systemic risks and financial contagion and on making recommendations to mitigate its effects.

The beneficiaries of this case study were the financial regulators in the country namely, the Kenya Commercial banks, Central Bank of Kenya, the Capital market authority and the Kenyan Bankers association in analysing how their regulatory policies on bank supervision aid in advancing systemic risk and financial contagion. The study further provided the country's regulators with a framework on how best to mitigate systemic risk borrowing from the past body of knowledge in relation to this concept.

The Kenyan commercial banks were large beneficiaries of this study bearing in mind that most systemic risk and financial contagion emanated from the banking sector first, and if cases of the recent 2015 financial crisis were to be avoided in the banking sector, Kenyan

banks ought to have implemented adequate measures to help prevent systemic risk. Lastly the study contributed to the large body of knowledge that exist on the concept as well as serving as reference to other scholars and researches.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides more information on the perennial problem of systemic risk that's inherent in the banking sector by reviewing different theories done by scholars on the topic. The objective is to develop a conceptual framework and further expound on the research gaps about systemic risk. The chapter also covers the empirical research evidence on the topic just to add width on the concept.

2.2 Theoretical Review

According to Kiaritha (2014), a theoretical framework provides understanding of the theories underpinning the study and the whole area of field which the research relates. The theories give a generalised perspective of the research concerns and hence it's imperative that the researcher is well conversant with the applicable theories, Kombo & Tromp, (2009).

Hannah (2015) sets the criteria for selection of a theory on; appropriateness, application and relevance to the study area of the research topic and provides linkage to existing knowledge. Aguilar (2009) states the importance of a theoretical framework in identification of study variables that will guide the researcher in data analysis and selection of appropriate research design.

The theories reviewed in this study are; too big to fail concept, over leveraging, Moral hazard, interconnectedness and dependency. These theories were reviewed based on the relationship between independent and dependent variables.

2.2.1 Too Big to Fail Theory

Unlike most theories that have been developed by scholars, too big to fail theory was first introduced by Congressman Stewart in 1984 when bailing out the Continental bank of Illinois to a tune of 5.5 billion dollars. Over the years it grew to a big concept especially when the Federal bank of United States considered the concept one of the major problems that leads to systemic risk in the financial sector.

This theory describes financial institutions that have grown way too big and deeply entrenched with the economy; that their perceived failure no matter how temporary can cause a huge shock wave to the entire financial sector hence bailing such an institution is the only way in avoiding systemic failure in the whole sector. Scholars over the years have argued that the very cause of systemic risk is allowing financial institutions to grow too big for the economy to handle since it's with this growth that makes banks reduces their market discipline and engage in excessive risk taking as well as resource misallocation, Bernanke (2009).

Gunnarsson (2016) in his attempt to explain what really entails a too big to fail financial institution he discovered that: By allowing an institution to grow to a level of high importance in the economy, the financial sector will always be vulnerable to risk every time the said institution experiences a level of macro shock. The only way to prevent such a scenario is with a government bailout whenever such an institution is faced with capital inadequacy to meet its obligations. The larger the financial institution the more danger it poses to the sector and nothing captures this theory best like the fall of Lehman Brothers the fourth largest investment bank at the time of 2008 financial crisis, Singh (2009).

By allowing banks to grow to levels of systemic importance in the economy Central banks all over the globe did open doors for catastrophic systemic failure every time such banks are faced with capital shortfall or they are unable to meet their debt obligations. By relaxing regulations to allow banks to be one stop shop for financial problems a loop hole was created that allowed banks to grow to the status of too big to fail hence posing systemic challenges to the whole sector.

2.2.2 Modigliani-Miller Theory

Modigliani and Miller were the first scholars to introduce the concept of balance sheet gearing which is commonly known as leveraging. In their paper cost of capital in the 1950s, they pointed out that to some certain extent having debt in a firm balance sheet is considered vital in terms of achieving growth and stability. But over time leveraging grew as the modern economies grew and debt structuring especially in banks became more flexible with the introduction of derivatives contracts that helped banks bypass the regulations of matching debt to their available capital. It's this excessive nature of accumulation debt that led to the 2007/2008 financial crisis.

In trying to establish what too much leverage is in the banking sector, Frauke and Julian (2014) noted that; while leveraging provides banks with muscle to increase credit to the private sector and helps keep the wheel of economic growth going. Too much of leveraging makes the financial sector fragile and exposes banks vulnerability especially in the face of adverse macro shock. Over leveraging is one of the major catalyst of the systemic failure in the financial sector since it leaves banks with weak balance sheets that cannot withstand any form of market shock.

Brunnermeier and Sannikar (2014) took a different approach in relating over leveraging to systemic risk experienced in the financial sector. According to these two scholars over leveraging exposes banks' balance sheet weakness whenever there is an increase in volatility on banks asset prices. An increase in volatility in asset prices reduces value of banks assets that are used to sustain these debts and this creates a chain of chaotic systemic failure in the entire financial sector on what they considered as volatility paradox theorem.

2.2.3 Moral Hazard Theory

It's one of those concepts that has been widely analysed in trying to explain bank behavioural bad habits especially with respect to systemic risk. Moral hazard is simply the act of one party taking excessive risk without worrying the risk implication to the other party. The idea banks bailout by Central banks has led to an increase of excessive risk taking by banks to increase their bottom line and all these is without factoring the cost of the risk as well as the loss that emanates from this risk Krugman (2009). As long there is that safety net that will protect banks from going under; banks will engage in high risk ventures in order to boast their returns Gunnarsson (2016). Taking risk without factoring the cost and loss implications make banks vulnerable in case of a macro shock since more often than not projects which are highly risk tend to require a huge capital outlay that eat up on the little capital reserves banks tend to have to shore them in in the event of a liquidity constraints.

When Central banks increase their outreach from being the lender of last resort to being the safety net for banks when they face bankruptcy then they create an environment that creates market indiscipline. Banks will engage in high risky ventures chasing high returns

without being accountable in case the institutions faces collapse from losses resulting from their venture. The underlying behaviour will always be; as long as there is a bailout when the institution faces collapse or bankruptcy then investing while limiting risk will be thrown out. The norm will be investing to generate higher returns regardless of the cost or risk implications after all it's not the banks that will bear the final burden of losses.

2.2.4 Contagion Theory

While systemic risk is the market shock that affects the entire financial sector, contagion is how the risk spreads from one bank to another bank or one economy to another economy. Nothing captures the spread of financial risk from one bank to another bank like the modern connectedness of banks and how there is an increase linkages to how the whole sector transacts its business to how they package their products. It's like the whole banking sector is a system of one major bank connected through layers of many banks in the system where if one bank fails it won't take long for the macro shock to affect the others.

The level of bank connectedness helps to foster diversity in the financial sector but when left unchecked by the regulators interlinkages of banks can increase the risk of contagion, Chen and Hassan (2016). Freixas (2000) was of the opinion that too much interconnectedness creates market indiscipline which allow banks that are close to insolvency to keep on operating. Connectedness creates a platform through which banks can use to obtain short-term line of credit to shore up their illiquidity but at the same time it opens the banking sector to systemic risk. When one bank fails to honour its debt obligation it can create a counterparty risk enough to collapse the entire financial sector.

Interconnectedness is the pipeline through which financial risk is spread in the entire financial sector. It's fair to point out that in the current era of globalisation and technological advancement it's hard for the financial sector not to be interlinked but at the same time it's also fair to note that when left unchecked this pipeline that allow banks to be able to meet their short debt obligations by borrowing from each other through overnight lending system can create havoc when one of the banks in the system fails to honour its debt obligation.

Chen and Hassan (2016) further noted that financial contagion is advanced through interconnectedness by banks having the same cluster of asset portfolios. This makes it hard for banks to absorb any kind of macro shock especially if it's in regards to volatility that affect asset prices. The same way the shock will affect player A in the financial sector is the same way it will affect player B and the chain goes on and on until the shock has transcended to the last player in the sector.

2.3 Determinants of financial contagion

Financial contagion is how the risk spreads from one bank to another bank or one economy to another economy. Financial contagion is a bridge that facilitates flow of risk from point of origin to another location. Nothing captures the spread of financial risk from one bank to another bank like the modern connectedness of banks and how there is an increase linkages to how the whole sector transacts its business to how they package their products.

2.3.1 Interconnectedness and interdependency

Financial contagion in the banking sector according to De Bandt and Hartmann (2000) occurs through the information channel and the exposure channel. The information channel refers to when negative information from one bank causes panic in the banking sector that result to bank runs and other sudden reaction from financial partners. The shocks emanate from one region or sector and afterwards spread to other regions affecting the banking sector. For instance, a Bank in Rhode Island USA which was soundly solvent declared bankruptcy after CNN published a report about failing Banks with the photos of that specific bank. The exposure channel refers to the negative happenings in the interbank dealings which may trigger a domino effect in the event one bank is unable to meet its obligations.

2.3.2 Asset Portfolio Alignment

An asset refers to both liquid and illiquid items that give value to a financial institution. According to Koch and MacDonald (2000), loan portfolios form up to 60% of illiquid bank assets and they pose the highest credit risk.

In the Kenyan banking sector for instance, all the commercial banks focus on lending to the same sectors of the economy. For instance all banks give personal loans to civil servants both at National and County government without any collateral other than proof of employment and payslip. In-case of any shocks to that particular sector of the economy, all banks linked to the sector becomes automatically exposed to the consequences. The deep sharing of asset portfolios across the Banking sector enhances contagion in the event of macro shocks arising in one of the sectors. These therefore calls

for cautious diversification of the asset portfolio mix to cushion the banking sector spread of macro shocks emanating from one sector of the economy.

2.4 Empirical Evidence

2.4.1 Global Studies

Dee Bandt and Hartmann (2000) approached the concept of systemic risk by analysing USA banks attributes and relating the same to financial risk. Using the Fragility Hypothesis these scholars used three variables to explain the vulnerability in the USA banking sector that makes it prone to systemic risk. Among the variables they used to analyse the USA banking structure include; bank structure, financial institution interconnections, information and level of financial contracts and associated credibility issues. The results from the Fragility hypothesis were that; the susceptibility of the USA financial sector to systemic risk was the collective nature of the three variables that they used in analysing the market. The structure of banks in the sector made them vulnerable to bank runs or when there is a shock emanating from liquidity strain, the reason was that banks had less capital reserves to shore them in the event a liquidity shock in the market.

Interconnection in the banking sector increased the counterparty risk in the sector, where in the event of a shock from one player failing to meet their credit obligation the risk was transmitted to the other players in the sector since most banks in the sector operate through guaranteeing each other credit line hence when a significant player fails to meet their credit obligation it creates a macro shock to the entire sector. The weakness with the fragility hypothesis was that it failed to capture different market dynamics and the different global market cluster where there is the Developed market, Emerging markets and Developing markets. All these markets have different exposure to macro shock;

whereas developing banking structures worry about capital adequacy for growth, developed markets banks risk to banking structure relates to over lending and how it leaves them vulnerable and weak to handle liquidity shocks.

Grossman (1993), Hassan and Dwyer, and Shoenmaker (1996) were among the first scholars to try and analyse systemic risk in banks using the autoregressive model. The Auto regressive model was based on regressing data from one particular period of failures to another period to see if there was a correlation of risk between different time periods. The data was extrapolated on a clustered time series of 1875 to 1914 and from 1915 to the late 90s taking into account the different macro environment of every time sequence. The result of the regression was that there was some level of correlation of quarterly failure among banks; where 1% increase in bank failures in one quarter led to a 0.26% increase of bank failures in the next quarter. Hassan and Dwyer refined the Autoregressive approach by using the probit analysis to provide more evidence of the inter-temporal failures in banking's. They broaden their scope by matching market crisis with the region of occurrence. Though the data analysed showed some level of correlation, this methodology was flawed since it failed to factor the different macro shock dynamics that affect banks at different time sequence hence it will be wrong to relate one market crisis of one time period to the next when the variables relating to these two periods were far from correlating.

Fouque and Langsam (2013) approached the concept of systemic risk by analysing the spread of the risk by using the contagion index. Their methodology focused on understanding the crisis spill over by analysing the role of balance sheet size and network structure of 1200 Brazilian banks through a one year period from 2007 to 2008. They

used these two variables to understand the systemic risk that Brazilian banks were exposed to during the 2008 Global recession. By extrapolating their methodology to a wide pool of data set these two scholars were able to cluster systemic risk efficiently. According to their findings, a bank size with respect to its balance sheet was not enough for it to be considered systemically important hence posing high financial risk to the sector. A bank size ought to go hand in hand with its level of market interconnectedness within the financial sector. From their research they concluded that; it only takes one institution with a high level of market interconnectedness alongside a big balance sheet to cripple the entire Brazilian financial sector. Relating the Brazilian financial sector to the 2008 financial sector, Fouque and Langsam (2016) noted that: While the network structure involving banks interconnectedness may affect the global level of systemic risk like what was experienced in the 2008 crisis that started in the USA and still was able to affect the Brazilian financial sector. This structure does not provide metric or indicator for localising the source of systemic risk within the network.

Empirical evidence from analysing the Brazilian sector also showed that systemic risk cannot be analysed solely by looking at the internal structures of the banking industry, Macroeconomic fundamentals play a huge role in amplifying contagion risk so when analysing systemic shock its prudent to also factor the prevailing macro environment of the financial sector at the time. Kaufman (1994) using the bank of Illinois supported this theory that “core institutions” which are systemically important can pose high systemic risk in the financial sector especially when faced with macro shock. At the time of bailing the bank of Illinois, the United States congress had estimated that if allowed to go under the bank of Illinois would have caused insolvency to 27 banks while 56 banks would

have lost 50% of their core capital. While this theory helps in showing the risk of having big institutions in the financial sector it doesn't really show the actual occurrence of systemic risk.

2.4.2 Regional Studies

Majority of African Banking sectors are reliant on domestic deposits and lending and are insulated from foreign finances. Financial sectors in Sub-Saharan Africa are prone to systemic risk although the level of interconnectedness within the financial sector is not yet deeply entrenched. For instance, South Africa experienced a bank crisis between the period 2002 and 2003. The bank of Saambou collapsed in February 2002 triggering failure of a series of bank runs that resulted to the collapse of the fifth largest bank. By the end of 2003, 22 banks had collapsed due to a liquidity crisis that emerged from the collapse of Saambou bank.

2.4.3 Local Studies

In Kenya, banks such as Continental Credit Finance Limited and Continental Bank of Kenya limited collapsed in 1986. In 1987, Capital finance Limited and other banks also collapsed. All the collapsed banks came together to form Consolidated Bank in 1989. A further 13 banks collapsed in 1993 with an additional 5 collapsing between 1996 and 1999. In the year 1999, Trust bank collapsed due to insider lending to shareholders and directors.

Though, the severity of systemic risk and financial contagion hasn't been experienced in the Kenya banking sector as it has been observed in other major economies. The few times the country's banking sector has faced the risk it has created a confusion like none

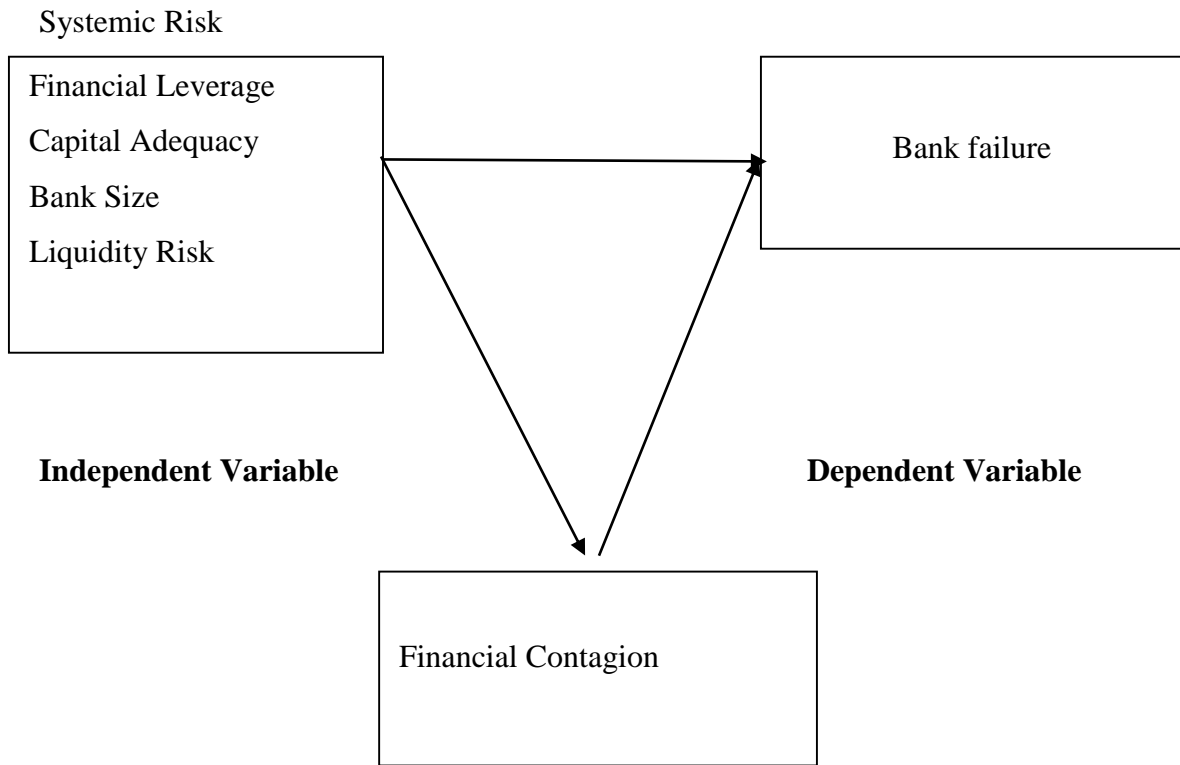
before, leaving the sector very exposed as it was recently observed by the 2015 collapse of Chase bank and the 1989 fail of more than 37 banks due to poor banking policies and regulatory structures, (Kithinji and Waweru 2007; Ngugi 2001).

Gathaiya (2007) focused his studies on the determinants that resulted to the collapse of banking institutions in Kenya in the year 2015 to 2016. The study concluded that the determinants to bank collapse included weak risk management practises, lack of proper internal controls, poor oversight from regulatory bodies, insider lending, weak corporate governance, political and executive corruption and ineffective laws.

2.5 Conceptual Framework

According to Borg (2005), a conceptual framework is a representation of the relationship between variables in a study. For this research, the dependent variable was Bank failures which were triggered by systemic risks arising from; too big to fail, over leveraging and moral hazard concepts and financial contagion aided through interconnectedness and dependency. There exists a direct relationship between bank failures, systemic risk and financial contagion in the sense that; for a bank failure to occur there must be a systemic risk that has been propagated through financial contagion.

Figure 2.1: Conceptual Framework



Source: Researcher (2019)

2.6 Summary of the Literature Review

Table 2.1: Summary of Literature Review

Author	Form of Study	Methodology	Findings	Knowledge gap
Fouque and Langsam (2016)	Understanding crisis spill over among the Brazilian banks	Contagion index	Bank structures along with its network of interconnectedness tend to factor a lot in enhancing systemic risk	The study failed to adjust the contagious index to macroeconomic fundamentals as well as factoring the market relevance
Dee Bandt and Hartmann (2000)	Study of the vulnerability in the USA banking sector	Fragility Hypothesis	The USA banking sector was vulnerable to shocks due to inadequate capital reserves to shore them up in the event of liquidity shock in the market	The fragility hypothesis failed to capture different market dynamics and the different global market clusters where there is developed market, emerging markets and developing markets.
Grossman (1993) Hassan and Dwyer and Shoenmaker (1996)	Study of Systemic risk in banks focussing on different periods of bank failures	Autoregressive model	There was a level of correlation of quarterly failure among banks where 1% increase in bank failures in one quarter led to a 0.26% increase.	The methodology failed to factor the different macro shock dynamics that affect banks at different time sequence hence it would be wrong to relate one market crisis of one time period to the next when the variables relating to these two periods were far from correlating.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter elaborates the methodology employed to investigate the impact of systemic risk and financial contagion in Kenyan banking sector for 30 years from the years 1988 to 2018. The chapter expounds the research design, population, data collection and analysis methods.

3.2 Research Design

The study adopted a descriptive research design. Descriptive research depicts the exact state of events as at the time of reference. According to Zikmund (2003), the researcher has no control over the variables and can only capture the situation as it is or was. The study chose a quantitative descriptive research design because the events of bank failures being investigated for systemic risk and contagion already happened in the past. The study focus was creating a picture of bank failures through financial ratios and from which the study was able to segment bank failures into time period of occurrence. The study further incorporated correlation analysis as a tool in trying to analyse if there was repetition of risk factors that contributed to bank failures across different time periods.

3.3 Population and Sampling

Mugenda and Mugenda (2003) describe Population as a whole group of individuals, objects having common discernible characteristics. Sekeran and Bougie (2011) opines that population refers to the whole set of groups of people, situations or things of interest that the researcher is investigating.

The target population of the study was all the commercial banks licensed and operating in Kenya from 1988 to 2018. According to Zikmund et al (2010), a sample is a subset from the whole population. Kothari (2004) notes, that sampling design deals with the technique of selecting items to be studied and analysed for a particular study. Kombo and Tromp (2009) describe a sample as a chosen representative unit selected from the target population. For this study, we focus on all the commercial bank failures that happened from 1988 to 2018 clustered into five year periods.

3.4 Data collection

The research was based on Secondary data extracted from financial statements of the licensed commercial banks from the annual Central Bank Supervision reports from the year 1988 to 2018 for all the variables. Secondary data was used because it represented an accurate state of affairs at each period of investigation. Secondary research is described by Dawson (2009) as collecting data from already documented and archived studies by other researchers in the area of interest. Data collected from the financial statements included Solvency ratio, liquidity ratio, portfolio structures and NPLs. A secondary data collection form (appendix 3) was used to summarise data for each period.

3.5 Data Analysis

This part talks about the techniques that were employed to analyse data and test variables. Financial ratios computed using excel spread sheet in order to get study variables. The technique used to collect data was time series analysis.

Data was grouped into three different time periods with a five year range, from which factors that contributed to bank failures were isolated. The data segmentation aimed to establish if the bank failures in these time periods had any link with systemic risk.

It should be noted though that there exist no formula that can isolate what systemic risk is individually, so the study attempted to showcase the occurrence of systemic risk through isolation of bank failures in a particular time period from which all the risk that contributed to the failures at that time was analysed. This enabled the study to create a group of risk factors that summed up systemic risk which in turn led to bank failures.

The bank ratios used to isolate bank failures were; Liquidity ratios i.e liquidity risk and capital Adequacy, Solvency ratios i.e financial leverage and performance ratios i.e operating efficiency. These ratios enabled the study to isolate different risk that made up systemic risk in the Kenyan Banking sector. From the ratios correlation analysis was used to link triggers of bank failures in the different time periods.

Lack of data made it hard to analyse each variable through regression analysis but the overall factors that made up systemic risk was analysed through a regression equation

Where:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \epsilon$$

Y = bank failure

α = y intercept of the regression equation

$\beta_1, \beta_2, \beta_3, \beta_4$, =are the respective coefficients of the independent variable and control variable

X1 = financial leverage given by total debts to total assets

X2 = capital adequacy given by equity to total assets

X3 = liquidity risk given by total current assets to current liabilities

X4= risk correlation of bank failures across time

E is the error term.

Systemic risk= (β_1X_1 , β_2X_2 , β_3X_3)

Financial contagion = (β_4X_4)

Hence, Bank failures = systemic risk + financial contagion

The study employed the use of financial ratios and correlation analysis is analysing the data. The regression equation was only used as a representation of the overall risk factors and financial contagion that led to bank failures. The data obtained was not enough to regress the variables within the limits and specification of regression analysis.

3.5.1 Measurement of Study Variables

The study adopted bank failure as dependent variable. Financial leverage, Management efficiency, Liquidity Risk, Capital Adequacy, Asset portfolio concentration and interconnectedness and dependency constituted the explanatory variables for the study.

Table 3.1: Measurement of Study Variables

Variable	Measure	Adapted from
Bank Size	Impact of Bank size on bank performance	Smirlock (1985)
Financial Leverage	Total debt to Total Assets	Gatsi et al., (2013)
Liquidity Risk	Total Current Assets to Total Current Liabilities	Ogilo & Mugenyah (2015)
Capital Adequacy	Total Equity to Total Assets	Yirgu (2017)

3.5.2 Model specification and diagnostic tests

Baltagi (1995) notes that panel data is used to factor time effects and also to control for individual heterogeneity. To determine the outcome of the effects of the financial risk on the performance of commercial banks in Kenya, the study applied both long run and short run panel models. The data analysed was from a 30 year period starting in 1988 stretching to 2018 with a 5 year intermediate level. From the data it was observed that; the assumption for long run model was that, the previous period performance did not affect the present period performance while the short run model is based on the assumption that immediate previous performance influences present period performance. The long run and short run model for the study objective is:

The intent of the study was to find out the impact of systemic risk and financial contagion in the banking sector in Kenya. The study assumed the independent variable and the dependent variable have a general linear relationship where;

$$\text{Bank failures} = A \text{ systemic risk} + B \text{ financial contagion}$$

The dependent variable A was further analysed using financial ratios to determine banks strengths with regards to balance sheet leverage structures and how covered banks were in regards to capital cover to shore them up in the event liquidity and credit shock in the market.

$$\text{Capital adequacy} = \text{Equity} / \text{Total Assets}$$

$$\text{Financial Leverage} = \text{Total debt} / \text{Total Assets}$$

$$\text{Liquidity risk} = \text{Current Assets} / \text{Current Liabilities}$$

$$\text{Operating Efficiency} = \text{Total Operating Expenses} / \text{Total Income}$$

Variable b was analysed using the banking stock share performance at the NSE, where it was observed how banks stock performance traded after there was negative news especially one about the collapse of a bank.

$$P_n = \frac{p_2 - p_1}{p_1}$$

P_n is the total share price, with p_2 representing the end of day share price, while p_1 represents the previous day share price.

These tests were done to establish the reactions of banks with regard to different market shocks so as to determine how exposed banks were in the event of a financial shock that could threaten the collapse of the banking sector.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This Chapter analyses data collected from the CBK Bank annual Supervision Reports for licensed and operating Commercial Banks in Kenya from the year 1988 to 2018 to investigate the relationship between systemic risk and bank failures.

The study analysed commercial banks financial data for a period of 30 years starting from 1988 stretching to 2018 with a 5 year short term segmentation period. Regression analysis was used to analyse banks failures within short term time periods while correlation analysis was used to establish whether past risk of bank failures led to present time bank failures.

The study focussed on three segmented five year periods where bank failures were experienced in the Kenyan Banking Sector. The segmented periods were bank failures between 1988 to 1994, 2000 to 2006 and 2011 to 2016.

4.2 Descriptive Statistics

Analysis of bank failures was done with respect to the prevailing macro-economic environment while taking into account the Solvency and Liquidity ratios of the banking industry of the time. The study focussed only on the failed licensed commercial Banks in Kenya from the year 1988 to 2018. It was imperative to subject these failures into different time periods in order to precisely analyse if systemic risk had any part in the failures of these banks.

From Table 4.1 below, it is clear that across time Asset cover was the lowest ratio metric that most banks scored poorly followed by liquidity and then capital cover. This representation within our idiosyncratic assessment of each time period of bank failures, where poor asset cover was the first trigger of financial risk and then followed by the inability to keep afloat as shown with the low liquidity among banks. Half of the Kenyan banks across different time periods did not have appropriate asset cover and this explains why they could not absorb market shocks brought about by loan default. Liquidity ratio was also low making banks hard pressed to finance their short term cash flow needs hence a shock from liquidity strain was in line to affect nearly half of banks during the captured time periods. Kenyan banks though scored well in terms of capital assets but these could be due to the illiquid assets like land and buildings that they had at the time.

Correlation analysis was deployed to see if there was any pattern of risk that was repeated through past and present time periods.

Table 4.1: Descriptive statistics

	Capital Adequacy	Asset Cover	Liquidity Ratio
Good	59%	40.3%	56.7%
Fair	5.9%	22%	24%
Marginal	15.2%	6.7%	11%
Unsatisfactory	19.7%	11%	3%
Valid (Failed Banks)	N		

Source: Researcher (2019)

4.3 Correlation Analysis

Correlation analysis was deployed to see if there was any pattern of risk that was repeated through past and present time periods.

4.4 Bank Failures and Measures

Analysis of bank failures was done with respect to the prevailing macro-economic environment while taking into account the Solvency and Liquidity ratios of the banking industry of the time.

Over the past 30 years the banking sector has witnessed the fall of more than 28 banks and 15 non-financial institutions that were not necessarily categorized as banks i.e. credit firms. However the study focussed only on the failed licensed commercial Banks in Kenya from the year 1988 to 2018. It was imperative to subject these failures into different time periods in order to precisely analyse if systemic risk had any part in the failures of these banks. Segregation of data into time period cluster was also meant to respect the different regulatory policies of different regimes and the macro policy with regard to change of interest rate that was implemented by Central Bank at different times.

The segmentation involved analysing bank failures within a specific time period of occurrence from which Banking ratios were used to assess the healthy nature of banks' balance sheet whereas correlation analysis was deployed to see if there was any pattern of risk that was repeated through past and present time periods and lastly the macro-economic environment was used to gauge the overall economic status of the country at the time and analyse of changes of interest rate had an impact in triggering systemic shocks.

4.4.1 Bank Failures from 1988 to 1994

From the clustered bank failures time periods, 1988 stretching to 1994 represented the worst banking environment of the country. This period saw the collapse of 13 banking institutions with one bank Pan African bank closed by CBK as a result of continuing breach of the banking regulations.

Capital adequacy findings as shown below in table 4.3 are; 23% of the total 46 banks had strong capital cover. The remaining percentage was split in between marginal capital cover at 36% and 41% of the banking population having unsatisfactory capital cover.

Table 4.3: Capital Adequacy

Performance Indicator	Capital Adequacy No. of Banks	Percentage
Strong	11	23
Fair	0	0
Marginal	17	36
Unsatisfactory	18	41
Total	46	

Source: Researcher Findings (2019)

Table 4.4 below shows the findings on asset quality. The asset ratio which measures the quality of assets of banks was very poor for the whole industry with only 30% of the total 46 banks considered to have quality assets with sustainable core capital cover. A huge population of up to 49% had a very poor asset quality with 21% considered to have fair asset quality.

Table 4.4: Asset Quality

Performance Indicator	Asset Quality No. of Banks	Percentage
Strong	13	30
Fair	10	21
Marginal	0	0
Unsatisfactory	23	49
Total	46	

Source: Researcher Findings (2019)

Table 4.5 below shows the findings on liquidity ratios. 59% of the banks had strong liquidity while 9% had fair, 7% had marginal and 9% had below standard liquidity. Whereas the liquidity ratio was above the industry standard of 25% at 59%, it's worth noting that this ratio was skewed upwards by the huge outliers of ratios from banks like Barclays bank, Standard Chartered and Stanbic bank at the time.

Table 4.5: Liquidity Ratio

Performance Indicator	Liquidity No. of Banks	Percentage
Strong	27	59
Fair	3	9
Marginal	2	7
Unsatisfactory	3	9
Total	46	

Source: Researcher Findings (2019)

These banking ratios indicate that 1988 to 1994 was a time bomb of failure waiting to happen. The average performance of all the ratios with respect to healthy banks was 34% of the total banking population of 46 while 45% were rated unsatisfactory.

Table 4.6: Overall rating of Banks

Performance Indicator	No. of Banks	Percentage
Strong	16	34
Fair	4	10
Marginal	5	11
Unsatisfactory	21	45
Total	46	

Source: Researcher Findings (2019)

From the ratio assessment it was evident that more than half of the banking population were operating below par: hence it wasn't a surprise that 18 banks failed during this time period. Low capital cover and poor asset quality meant that half of the banks at the time couldn't weather any macro shock. Further, long term sustainability of these banks was in jeopardy because with poor asset quality it meant that they couldn't finance their operations and that they were limited to how much they could borrow or lend hence their survival was very much in doubt.

Weak balance sheet, Cash flow crunch and Exposure to short term liquidity shocks compounded to systemic risk resulting to this massive failure, though the overall shock was triggered by exposure to poor loan advancement practises. Half of the banks couldn't

weather the storm when counterparty risk emanated hence the failure of close to 18 banks and the closure of one by CBK.

4.4.2 Bank Failures from 2000 to 2006

This period marked a reduction of bank failures and also saw an increase of banking ratios that meant that banks were better prepared for macro shocks. But all these could be attributed to the change of political regime hence to substantiate what was systemic risk with regards to the failure of the 6 banks in this era was very hard.

Table 4.7: Asset Quality, Capital Cover, Liquidity Ratio and Overall rating of banks

Asset Quality	Percentage	Capital Cover	Percentage	Liquidity Ratio	Percentage	Overall Rating of Banks	Percentage
Good	54	Good	64	Good	55	Good	64
Fair	18	Fair	9.8	Fair	29	Fair	29
Marginal	12	Marginal	7.8	Marginal	16	Marginal	7
Unsatisfactory	10	Unsatisfactory	18	Unsatisfactory	0	Unsatisfactory	0

Source: Research Findings (2019)

Total number of banks was 45.

There was huge improvement of the banking ratios from the period of bank failures in the 1990s to the failures witnessed in early 2000. The average performance of banking ratios during this time stood at around 54% a 20% increase from the previous decade; these meant that banks were best to handle macro shocks from both credit risk and counterparty risk and that banks were in a position to withstand liquidity pressures that were brought about by over exposure to bad loans.

4.4.3 Bank Failures from 2011-2016

Table 4.8: Asset Quality, Capital Cover, Liquidity Ratio and Overall rating of banks

Asset Quality	Percentage	Capital Cover	Percentage	Liquidity Ratio	Percentage	Overall Rating Banks	of	Percentage
Good	54	Good	90	Good	56	Good	72	
Fair	38	Fair	8	Fair	34	Fair	24	
Marginal	8	Marginal	2	Marginal	10	Marginal	4	
Unsatisfactory	0	Unsatisfactory	0	Unsatisfactory	0	Unsatisfactory	0	

Source: Researcher Finding (2019)

Total Banks were 42.

Bank failures during this era represented a huge gate way from the past banking failures in the country. The country not only had a very solid and stable banking ratios but the economy was enjoying a robust growth hence the collapse of these three banks namely Chase bank, Dubai bank and Imperial bank was an unexpected market scenario.

90% of the total 41 banks had satisfactory capital cover to mean that they were in a position to absorb any credit shocks from the market. The market had an average of 56% liquidity cover which was 31% above the standard of 25% to mean that short term cash flow pressures could be easily managed and the non-performing loans were at all-time low at an average of 15% which marked a 10% decrease from the past decade. The asset quality was not all that bad also since only 5 banks which had marginal asset quality and for the five banks none of the collapsed banks were among them. Perhaps the most baffling of the credit and solvency ratios analysed was that none of the three banks had

either of their ratios at minimum level actually all the three banks had ratios which were considered acceptable compared to the industry average limits.

From the ratio assessments, all the banks at the time had clean bill of health and there was no reason that could have warranted the collapse of the three banks in the immediate future. But further scrutiny exposed these banks to fundamental flaws; the high level of exposure to individual and institution loans coupled with counterparty risks which triggered a liquidity strain in these banks operation. At one time, Dubai bank had loaned out 45 billion to one individual contrary to CBK banking act that placed a minimum cap of 25% of total capital lending to one single individual and institution. The same issues of exposure to high lending was paramount at imperial bank as well as chase bank and counterparty risk left the banks very exposed hence when they were first placed in receivership then sold it was to contain the situation from further spreading to the entire industry.

As soon as Dubai bank and Imperial bank were put under receivership in quick succession, the news spread fast and a bank run was triggered that left Tier 2 and Tier 3 banks exposed to high liquidity pressures. The situation wasn't helped by the increase in banks overnight lending to an average high of 25% especially to Tier 2 and Tier 3 bank: this hoarding of cash by Tier 1 banks made impossible for tier 2 and tier 3 banks to weather the short term cash crunch pressures and it wasn't long until Chase bank succumbed to a massive bank run on its deposits. These three banks that collapsed had one factor correlating them which was over exposure to lending to a single individual or investor and this was the link that triggered their fall.

Most Scholar have attempted to attach non-performing loans as the main reason as to why the three banks failed. Some scholars have gone to the extent of trying to use NPLs as the systemic trigger for the collapse of these three banks. The average NPLs for these banks were 18% to mean that the bank still had room to weather any short term liquidity crunch that might have been brought about by these NPLs. The Major shock from the assessed data was the heavy and huge exposure of these banks to individual and institution lending where a few group of people had a huge loan portfolio of these banks hence their exposure to counterparty risk arising from these was high. Whereas NPLs was among the factors for the collapse of these banks it wasn't the main systemic trigger, the first trigger was the high exposure of these banks then from which counterparty risk led to high level of NPLs that eventually led to the collapse of these banks.

4.5 Correlation Risk Assessment

It wasn't enough to map bank failures to their banking ratios and analyse the systemic risk trigger from these ratios. It was imperative to also look at how risks were correlated between these banks and how it related to different time periods. From correlation analysis we were able to determine the pipeline through which risk was spread from bank A to bank B. Through correlation analysis we were able to segment bank failures in the country into two factors namely portfolio bank structure and time correlation of risk.

4.5.1 Banks Portfolio Structure

This section analysed how banks structured their investments with respect to the available resource structure. The acceptable international standard with respect to bank investment their assets are as shown below in table 4.9.

Table 4.9: Banks Portfolio Structure

Asset Description	Percentage Allocation
Loans	65%
Government Securities	20%
Cash	10%
Other Assets	5%

Source: CBK (2015)

The correlation assessment of banking risk in the 90s showed that 70% of the 55% banks at the time had nearly the same balance sheet structure with 40% taking the loan advancement, 21% investment in government securities and 21% other investments. This data showed a divergence from acceptable international standards which left most banks open to short term liquidity pressures as well as very weak balance sheets.

25% deviation from the acceptable investment structure meant that banks in the 90s were not able to meet their short term liquidity pressure as well as manage their operations. Loans provide banks with not only profit but it's from loans that banks generate the cash flow required to manage their operations

A mixture of low cash flow and over exposure to other investment left banks at that time short in not only financing their operations but exposed in terms of macro shocks from credit risk in the long term. The reason banks are capped from over investing on investments that don't yield short term maturity is to protect investors money as well protect banks from risks from maturity returns. From the 18 banks that fell in the 90s

none of these banks had adequate cash cover and were operating from a position of borrowing in short term and lending expensive in the long term.

Mismatch of investments structured was only isolated in the 90s era as these portfolio structure dint have any relevance to the fall of banks in the 2000 millennia. This can be attributed to the stiff regulations that were implemented by the new political regime that was geared in bringing confidence in the banking sector.

4.5.2 Correlation of Risk Across time

By segmenting bank failures to specific time period, it was easier to analyse the forms of systemic risk and also it provided a platform through which we could compare different time periods of bank failures and analyse if there was repetition of relevant risk across different times.

Whereas most studies done on Kenya banking failures have pointed NPLs as the key factor to failures of Kenyan banks. This study has been able to dispel that notion by correctly matching bank failures to their relevant shocks at the time and the same was regressed across time to see if there was any correlation of the risks: and from the regression analysis, NPLs was not positive across time but when observed using another variable it did test positive. This meant that NPLs was a relevant variable only when attached to another relevant variable which was over exposure of advancing more than 25% of loan portfolio to a single investor or institution.

In the period 1988 stretching to 1994, there was a total of 26 banks that either collapsed or were closed by the CBK. The average NPLs at the time was around 25% to mean that banks still had around 75% of cash flow to use in managing their day to day operations as

well as weathering existing liquidity pressures. The issue wasn't NPLs as such but the level of exposure these banks had to a single investor or institution; when 45% of banks loan portfolio is controlled by less than three individual or investors then it means the bank exposure to counterparty risk is high and from which the case of NPLs will arise. From the 26% banks that fell, it's amazing to note that 90% of these banks were heavily exposed to advancing loans to a single investor or institution. Their failure was from the little room they had to manoeuvre in case of short term liquidity shocks especially if the single investor is faced with counter party risk. This means the banks will be short of cash flow to levels of 35% to 55% whenever counter party risk arises with the single investor or institution.

A bank without cash flow means it has already failed or is in the road to failing. The whole wheel that keeps the banking industry moving is borrowing to lend so when a bank can't borrow due to weak balance sheet and can't lend due to low levels of cash flow then the said bank is working towards an eminent collapse.

High concentration of loan levels to single investors meant that banks were exposed to credit risk and counterparty risk both in the long term and short term; these high level of loan concentration also meant that banks had very minimal room of manoeuvre in the event of shocks and their case was compounded further when their assets meant that they couldn't borrow in the short term to plunge the cash flow deficits.

Loan concentration was the only positive risk that tested positive across all the banks that failed in both short term and long term assessments. The response rate from this risk was an amazing 90% across all time periods of bank failures.

Using a margin scale of 1- 10, when 3 out 10 investors face counter party risk hence exposing them to failure to meet their loan obligations it means that the bank still has 7 other of the remaining investors from which they can draw their cash flow from. But when these 3 out of 10 investors control over 60% of the bank's loan portfolio like what was witnessed in all the segmented time periods of bank failure; it means that the banks will be short of cash flow to out manoeuvre its short cash obligation hence it will be open to liquidity risk as well as change of interest rate risk and with this it won't take long before the said pressure makes the bank collapse especially if its balance sheet is deemed weak to borrow from other banks.

Non-performing loans is no the monster to bank failures as what has been previous analysed as a cause of bank failures in the country. From the loan exposure we get counter party risk which then creates the overall systemic risk and this is triggered by failure of just one high level of loan concentrated investor from failing to meet their obligation. Without high loan concentration then NPLs is not relevant, it's only relevant when it's assessed with loan concentration as a variable and then it can be seen as a trigger to systemic risk.

Using the same margin scale to express why NPLs on their own don't count; if 3 out of the 10 investors a banks lends to fail to honour their obligation and it happens that this 3 control like 10% of the bank's loan portfolio then the said bank has 7 out of 10 investors from which it can draw 90% of its cash flow from. Access of 70% of the banks 90% loan portfolio is enough cash flow for the banks to absorb any liquidity strains.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter encompasses summary of the findings, conclusions derived from the study, researcher recommendations to the banking sector and stakeholders, limitations of the study and highlights possible areas for future research.

5.2 Summary of Findings

The study aimed to find the connection of systemic risk and bank failures in the country. The data analysed was banking data stretching from a period of 30 years back starting from 1988 up to 2018. The data which was analysed was collected from Central Bank, Bank Supervision annual reports. To achieve this analysis, bank failures were clustered into time periods of occurrence using a 5 year framework in order to better classify risks and capture the occurrence of systemic risk. The segmented periods were only those that experienced bank failure and these were between 1988 to 1994, 2000 to 2006 and 2011 to 2016.

Through regression analysis and bank performance ratios, the study was able to bring out the relationship between systemic risk and bank failures across different time periods with an exception of 2000- 2006 time periods. The fall of these banks namely charterhouse bank was a collection of fraudulent transactions, change of political regimes; hence it was difficult to link systemic risk during this era since the fall of this bank didn't have any contagion effect to the others. Even though the non-performing loans of the industry were averaging at an average of 28.5% it was very hard to find a link between

these and the fall of the six banks. This period was analysed with respect to change of political regime in the country hence the fall of the other banks i.e. Prudential bank, Reliance bank, Fortune Finance bank, Trust bank and Euro bank was simply all about the government trying to clean the mess of the old political regime hence systemic shock wasn't relevant in any case during this period of bank collapse. The isolation of banking failure across time periods helped in the assessment of the impact of change in macroeconomic fundamentals notably interest rates: this helped in analysing the extent to which change of interest rate could aide or triggered systemic risk that eventually led to bank failures.

Loan concentration was the only positive risk that tested positive across all the banks that failed in both short term and long term assessments. The response rate from this risk was an amazing 90% across all time periods of bank failures. . From the loan exposure we get counter party risk which then creates the overall systemic risk and this is triggered by failure of just one high level of loan concentrated investor from failing to meet their obligation. Without high loan concentration then NPLs is not relevant, it's only relevant when it's assessed with loan concentration as a variable and then it can be seen as a trigger to systemic risk.

5.3 Conclusions

From the analysis it was evident that it's hard to pinpoint systemic risk to one specific risk like liquidity risk, credit risk etc.: this conclusion was in line with previous works done by other scholars. From the data analysis it was observed that systemic risk is a collection of macro shock that tend to affect an entire financial system by the fall or collapse of one institution in the entire sector. What can be considered systemic risk in

one country is not necessarily systemic risk to another; it was further observed that what makes systemic risk a challenging macro shock to mitigate is how it spreads from one bank to the next bank using the network of bank structure and interdependence. From the data analysed about banking failures as a product of systemic risk and financial contagion it was observed that during the 30 year period; what constituted to systemic risk was high loan concentration, poor corporate governance and under capitalization whereas financial contagion was propagated by portfolio concentration.

The study concludes that systemic risk and financial contagion has been the cause of 70% of the total 26 banking failures in the country for the last 30 years. The only problem with this type of risk unlike other major risk like Liquidity risk, Credit risk and Market risk; there exist no appropriate methodology that can be used to mitigate such risk and when it occurs it's usually after a build-up of so many factors in the past. In the case of the most current banking failure of 2016, this risk was triggered after years of both Chase bank, Imperial bank and Dubai bank advancing huge some of their loan portfolio to single investors hence when the change of interest rate made borrowing expensive it triggered a series of defaults that led to their collapse.

5.4 Recommendations

A lot of changes have been introduced to mitigate shocks that can collapse the entire banking sector through systemic risk example include the newly adopted IFRS 9 and the Basel Accord III. But a lot ought to be done to further ensure there is minimal failure of banks in the country. The study recommend that the 25% minimum cap that was placed to limit how much banks should lend to a single individual should be further lowered to around 15%. This will go a long way to rein in to the bad corporate behaviour of insider

loans to single investors that leave banks open to systemic shocks. Further there should a cap limit to how much banks in different Tiers can lend, this will rein in the behaviour of small banks over exposing their lending portfolios.

The study further recommends that all lenders to diversify their loan portfolios in order to mitigate on concentration risks that may fuel financial contagion in the event of a macro shock.

The study also recommends that the bank regulators and stake holders to ensure that high standards of corporate governance and accurate timely financial reports are maintained in order to eliminate moral hazard related risks.

5.5 Limitations of the Study

The study was not able to match contagion with respect to share performance as earlier detailed in the methodology the reason being that; its only 12 banks that trade in the NSE bourse and out the 12 banks that trade 60% are Tier one bank. This meant the data collected wouldn't have been representative of the total population hence this strategy was scraped due insufficient data pool.

Since the study analysed data using a long term time period, it was hard to get accurate reports and bank financials of the 80s and early 90s hence the study had to be adjusted and the mean average of the ratios were used to make sense of the existence of systemic risk in Kenyan banking sector. Due to the limited time scope of the research, the study was not able to further scrutinize the effect of each bank failures to the wide scope of the banking sector especially bank failures in the 90s

The study was not able to use regression analysis as intended due to the fact that CBK standards for bank analysis is the use of financial ratios and the data available at the time was not adequate for the study to use regression analysis within the laid assumptions of regression analysis. An attempt to analyse the Independent variable through regression would have resulted in Multicollinearity and the whole study wouldn't have passed the ANOVA test hence the F-test wouldn't have been significant. The regression equation used in the study was as a form of descriptive statistics just to express in equation terms how bank failures was a factor of both systemic risk and financial contagion.

5.6 Suggestions for Further Research

Further studies can be done on the effect of each bank failures to the wider scope of the banking sector. This research will try to compare the effect and magnitude of bank failures in the banking sector in the 90s and in the 2000s hence increasing more knowledge on this area of study.

Further research can be undertaken to determine the impact of the mergers and acquisitions and the expansion of banks to other territories outside of Kenya on the stability of the Kenyan Banking sector. This research will provide more insights to the regulators on the complex risks that may emerge out of the expanded and highly interdependent and interlinked local, regional and global banking sector.

Finally, further research should be undertaken to investigate the extent to which portfolio concentration is entrenched in the Kenyan Banking Sector in order to provide insight to the regulators and stakeholders to mitigate inherent risks.

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APPENDICES

Appendix 1: Commercial Banks of Kenya

- 1) Kenya commercial bank ltd
- 2) Standard chartered bank ltd
- 3) Barclays bank of Kenya ltd
- 4) Co-operative bank of Kenya ltd
- 5) CFC Stanbic bank ltd
- 6) Equity bank ltd
- 7) Bank of India ltd
- 8) Bank of Baroda ltd
- 9) Commercial Bank of Africa Ltd
- 10) Prime bank ltd
- 11) National bank of Kenya ltd
- 12) Citi bank N.A.
- 13) Bank of Africa ltd
- 14) NIC bank ltd
- 15) Guaranty Trust bank ltd
- 16) I & M Bank ltd
- 17) Diamond trust ltd
- 18) Family bank ltd
- 19) Housing finance corporation ltd
- 20) Eco bank ltd
- 21) Habib bank ltd
- 22) Oriental commercial bank ltd

- 23) Habib A.G.Ziruch ltd
- 24) Middle east bank ltd
- 25) Consolidated bank of Kenya ltd
- 26) Credit bank ltd
- 27) Trans-National bank ltd
- 28) African Banking corporation ltd
- 29) Giro commercial bank ltd
- 30) Equatorial bank ltd
- 31) Paramount universal bank ltd
- 32) Jamii Bora bank ltd
- 33) Victoria commercial bank ltd
- 34) Guardian Bank ltd
- 35) Development bank of Kenya ltd
- 36) Fidelity commercial bank ltd
- 37) K-Rep bank ltd
- 38) Gulf African bank ltd
- 39) First community bank ltd
- 40) UBA Kenya bank ltd.
- 41) Chase bank ltd (under receivership)
- 42) Imperial bank ltd(under receivership 13th October 2015)
- 43) Dubai bank ltd (under liquidation)
- 44) Charterhouse bank ltd (under statutory management)

Source bank supervision report CBK (2015)

Appendix 2: List of Liquidated Banks in Kenya

	Name of Institution	Liquidation Date
1	Post Bank Credit	March 1990
2	Inter-Africa Credit & Finance Limited	31 st January 1993
3	International Finance Limited	16 th April 1993
4	Central Finance Limited	19 th May 1993
5	Trade Bank Limited	18 th August 1993
6	Trade Finance Limited	18 th August 1993
7	Middle Africa Finance Limited	20 th August 1993
8	Diners Finance Limited	20 th August 1993
9	Nairobi Finance Limited	20 th August 1993
10	Allied Credit Limited	20 th August 1993
11	Pan-African Bank Limited	18 th August 1994
12	Pan- African Credit & Finance Limited	18 th August 1994
13	Thabiti Finance Limited	19 th December 1994
14	Meridien Biao Bank Limited	15 th April 1996
15	Heritage Bank Limited	13 th September 1996
16	Kenya Finance Bank Limited	29 th October 1996
17	Ari Bank Corporation Limited	5 th December 1997
18	Prudential Bank Limited	5 th May 2000
19	Reliance Bank Limited	12 th September 2000
20	Fortune Finance Limited	14 th September 2000
21	Trust Bank Limited	15 th August 2001
22	Euro Bank Limited	21 st February 2003
23	Prudential Building Society	18 th January 2005
24	Daima Bank Limited	13 th June 2005
25	Charter House Bank	23 rd June 2006
26	Dubai Bank	24 th August 2015
27	Imperial bank	13 th October 2015
28	Chase Bank	7 th April 2016

Source: Kenya Bankers Association

Appendix 3: Secondary Data Collection Form

Bank Failure Period 	
Liquidity Risk	
Bank Size	
Leveraging	
Capital Adequacy	

Appendix 4: Total Asset- Secondary Raw Data, Profit, Return on equity, NPL ratio and Market Risk

<https://www.centralbank.go.ke/reports/bank-supervision-and-banking-sector-reports/>