



BOARD COMPOSITION AND ENTERPRISE RISK MANAGEMENT IN THE BANKING INDUSTRY IN KENYA

Kahenya Nancy Njeri

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Strathmore University
Nairobi, Kenya**

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Kahenya Nancy Njeri

..... [Signature]

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This Research Proposal has been submitted for examination with my approval as the Supervisor.

..... [Name]

..... [Signature]

..... [Date]

Strathmore Institute of Mathematical Sciences

Strathmore University

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LIST OF ABBREVIATIONS

ERM	Enterprise Risk Management
BOD	Board of Directors
CBK	Central Bank of Kenya
NSE	Nairobi Securities Exchange
SOA	Society of Actuaries
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CMA	Capital Markets Authority
OP	Operating Profits
ROE	Returns on Equity
USA	United States of America
UK	United Kingdom

ABSTRACT

The Kenyan banking sector has experienced a myriad of changes, both negative and positive. Being a developing economy, the sector's efficiency and sustenance is vital to the country's economy. Enterprise Risk Management and Board of Directors' composition are both significant issues ensuring stable economies and avoiding corporate mishaps such as those witnessed in the Eron and Worldcom cases. ERM is measured in terms of financial performance. It is in this light that this study seeks to find the relationship between ERM and board composition in terms of gender, education, and board size. Based on the Shannon's diversity test, the study establishes that the boards of Kenyan listed banks are not diversified in terms of gender and educational backgrounds in boards is quite minimal. The study also finds out that there exists a relationship between board composition and ERM.

Key terms: Kenyan banking sector; ERM; BOD; Board composition; Correlation.

CHAPTER ONE

1. INTRODUCTION

1.1 Background to the study

After the 2008 global financial crisis, a paradigm shift has had to happen in the way financial and non-financial institutions view risk management. Instead of looking at risk management from an individual-based perspective of various risks, a holistic view of risk management is being adopted. This is enterprise risk management (ERM) (Berger, Kick , & Schaeck, 2012). Unlike traditional risk management where individual risk categories are separately managed in risk "silos", ERM enables firms to manage a wide array of risks in an integrated, wholistic manner (Liebenber & Hoyt , 2011). An increasing number of organizations globally have implemented or are considering adopting ERM programs. It is in this new dawn that ERM and board of directors' relationship has also blossomed with organizations such as Ernest & Young (EY) (2015) referring to ERM implementation as the top priority function and trend for board of directors.

This turbulence impacted the core existence of the banking industry with major regulatory reforms being adopted with the aim of enhancing stability and transparency. The Kenyan banking sector has not been of exception where it has seen the Central Bank of Kenya (CBK) put three banks under receivership due to challenges associated with liquidity and mismanagement, among others (Stevies, 2016).

Mínguez-Vera, Campbell, & Antonio (2008) and Berger, Kick , & Schaeck (2012) find that high-profile financial crisis and failures of organizations such as Enron and WorldCom, and subsequent corporate governance reforms have contributed to the increased attention on the role of board of directors in recent years in search of how to improve and reform governance arrangements and risk management. Corporate governance research has devoted tremendous effort to studying the roles of the board of directors in recent years, with the composition of the board of directors raising particular interest (Berger, Kick , & Schaeck, 2012). Reports, such as the Turnbull 1999 Report on Internal Control issued by the Institute of Chartered Accountants of England and Wales (ICAEW) for the board of directors of UK listed companies (McCrae & Balthazor, 2000),

have provided guidelines which incorporate directors' and managers' responsibilities into the areas of corporate risk management and makes the board of directors specifically accountable for developing organization-wide risk management policies and for implementing integrated, inclusive and dynamic risk management strategies (Financial Reporting Council, 2011).

Diversity indices such as the Simpson Index (D), the Jaccard's index, and Smith and Wilson's Index (Magurran, 2003), provide information about community composition. Gender quotas are often seen being advocated for to help improve career outcomes for females and 'break the glass ceiling', and the same goes for educational requirements for boards to improve corporate governance.

1.2 Problem statement

The banking sector and its stability is a key strategic asset for any developing economy, in Kenya particularly, as it is a direct measure of availability of finance and financial services (Muteti, 2014). With this vital role that the banking industry plays, comes high risks in its operations and sustainability. These are increased by technological advancements, high competition, and globalization, leading to increased complexity of the banks' risk profile (Dafikpaku, 2011). This then puts management as a key competence component and board of directors in the perspective of this study. Board members play a vital role during mergers and acquisitions, assessing the overall direction and strategy of any business which includes risk management, hence serves as the backbone of the company given (Kilic, 2015).

The recent financial crisis and the failure of banking system even in the developed countries like the USA has forced the policy makers and researchers to look into the details of these failures and in doing so, enterprise-wide risk management and board of directors' composition have both emerged as trends that are pivotal to the survival of any organization (Yegon, Mouni, & Wanjau, 2014). Waves of change such as increased female appointments and participation in the BOD as a regulatory requirement such as that provided for in the Kenyan constitution, has raised stereotypes and uninformed conclusions. This study aims at giving empirical and reliable conclusion on the BOD size,

gender representation and education background in the banking industry in the context of ERM implementation.

1.3 Research objectives

The broad objective of this study is to deduce the relationship between Board of Directors composition and ERM implementation in the Kenyan listed banks. The specific objectives are:

1. To measure the level of diversity in the BOD of listed banks in Kenya.
2. To determine whether there is a relationship between diversity of BOD and ERM implementation.

1.4 Research hypothesis

The research hypothesis in this study is:

H₀₁: Boards in Kenya's listed banks are diversified.

H₀₂: There is a correlation between board composition and ERM in Kenyan banks.

1.5 Scope of research

The proposed research will focus on publicly trading banks in Kenya due to the ease of accessing the data required. The study will seek to determine how board of directors' size, gender and education background interweave with ERM implementation. The period under consideration will be between 2008 and 2015 for the 10 banks listed on the Nairobi Securities Exchange (NSE). This is because this is the immediate period during and after the financial crisis during which major reforms in corporate governance and risk management took place.

1.6 Significance

The study provides useful information to policy makers and regulators such as the CBK to formulate and enhance policies and programs that will actively stimulate the growth and sustainability of the banking industry in the country and in the process, alleviate issues

such as those seen in Imperial Bank and Chase Bank. The study will also benefit management and shareholders of banks to gain insight on ERM which is a field whose benefits outweighs its costs. It will help companies as their make their board appointments and other upcoming boards as that very important composition is made, and particularly in a volatile economy like that of many African countries, for sustenance and success of these business today. Both ERM and board diversity are emerging issues of research. This study will make contribution to this literature which is limited, to researchers and scholars and in Kenya especially, and in addition it hopes to spike interest in them for further studies in the research gaps that may arise.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Evolution of risk management

The perception that the future rests on more than just a quirk of the gods is a groundbreaking discovery that separated the present-day risk assessment and hedging techniques from decisions guided by superstition, blind faith and instinct (Bernstein, 1996). Risk management is an age-old discipline that can be traced way back to the Babylonian times (McNeil, Frey, & Embrechts, 2005) and it has grown over time in conjunction with other disciplines.

Before the 1970s, corporations used to manage only the downside of risk largely by buying insurance against the various losses associated with accidents (Misiura, 2015). The use of derivatives as an instrument of risk management arose during the 1970s when financial risk became a vital source of uncertainty in the economy (Jorion, 2010). This expanded rapidly during 1980s where companies intensified their financial risk management and tools for handling financial risk were developed. The table adopted below is an analysis of some of the various tools that have marked the foundation of modern risk management over time (Jorion, 2010).

Table 1: Adopted from Jorion Philippe's 2010.

Year	Tool
1938	Macaulay's bond duration
1952	Markowitz's mean-variance framework
1963	Sharpe's one factor beta model
1966	Multiple-factor models
1973	Black Scholes option pricing model
1982	ARCH models
1992	Heath-Jarrow-Morton term structure models
1993	Value at risk
1994	Risk Metrics™
1997	CreditMetrics™

Chronological analysis of support tools in the evolution of modern risk management.

International regulation of risk also began in the 1980s (McNeil, Frey, & Embrechts, 2005). Financial institutions developed internal risk management models and governance of risk management became essential with the introduction of integrated risk management where Chief Risk Officer (CRO) positions emerged (Dickinson, 2001). Historically, companies formally managed risk by solely purchasing insurance policies. This has however changed with gradual growth of this discipline and not only is the downside of risk managed, but also its upside considered and exploited for example value-creating potential of risk into the business as a whole (Lam, 2003). Various factors have contributed to the complexity of the business world and the economic environment leading to the development and evolution of the risk management discipline and its structures. These factors include corporate and financial scandals, increasing market regulations and professionalism, globalization, innovation, information and technological developments, among others (Lam, 2003).

This evolution brought about the ultimate development, ERM in the 1990s. With ERM came the recognition that risk affects organizations in a holistic manner unlike the traditional silos it was previously viewed (Lam, 2003). Increased interest and study in ERM over time has shifted risk management role from specific departments to the whole organization thus becoming one of the core strategies of responding to market changes and improving overall performance. The latest and growing developments have been on the board involvement in the governance of risk of a given organization or company by determining its levels of risk tolerance and risk policies, and overseeing management in the design, implementation and monitoring of the risk management and internal control systems (Corporate Governance Council, 2012; Financial Reporting Council Limited, 2014; Financial Reporting Council, 2005).

2.2 Enterprise risk management

Interest in Enterprise Risk Management (ERM) has continued to grow in recent years with an increasing number of organizations implementing or considering ERM programs such as universities and small businesses, consulting firms have established specialized ERM units, rating agencies have begun to consider ERM in the ratings process, and universities

have developed ERM-related courses and research centers (Gordon, Loeb, & Tseng., 2009).

Unlike traditional risk management where individual risk categories are separately managed in risk "silos", ERM provides a structure that combines all risk management activities into one integrated framework that facilitates the identification interdependencies among various risks (Lam, 2003). Management of various types of risks that an organization is faced with misses the most important aspects of risk management such as the organization's risk appetite and management of emergent risks. Specialists and academicians have argued that ERM benefits firms by decreasing earnings and stock price volatility, reducing external capital costs, increasing capital efficiency, and creating synergies between different risk management activities among them being Hoyt & Liebenberg (2008), Kraus & Lehner (2012), and Golshan & Rasid (2012). According to the Society of Actuaries (SOA), organizations' objectives for pursuing ERM are: competitive advantage, strategic goals, transparency of management, decision making, and stakeholder.

2.2.1 The COSO Integrated ERM framework

In the context of ERM, a framework would aid in its implementation through organizing and structuring an approach that can be measured and repeated (Dafikpaku, 2011). An ERM framework, such as the ISO 31000:2009, Risk Management – Guidelines on Principles and Implementation of Risk Management, ought to identify and analyze risk and then either avoid, reduce, share or accept it.

In 2001, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) embarked on a project, together with PricewaterhouseCoopers (PWC), to develop a readily usable framework that would evaluate and improve their organizations' ERM (COSO , 2004). This was after increased spotlight on risk management that led to the realization that there was a need for a robust framework to effectively and efficiently identify, assess, and manage risk (COSO, 2004). The Enterprise Risk Management–Integrated Framework was thus born in 2004 which is applicable to all industries and encompassing all types of risks.

COSO defines ERM as (COSO, 2004); “Enterprise risk management is a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”

COSO’s ERM framework aligns organizational objectives and risk management components in a three- dimensional matrix, in form of a cube as shown below (COSO , 2004). The vertical columns represent the four organizational objectives categories, the horizontal rows exhibit the components of ERM and finally the various levels of organizational units (COSO, 2004). This indicates that a relationship exists among the various aspects represented.

Figure 1: COSO's ERM-Integrated Framework.



COSO’s three- dimensional cube-matrix aligning organizational objectives and risk management components.

2.3 The Banking sector in Kenya

The Kenyan banking industry comprises of the Central Bank of Kenya (CBK) which has the overall regulatory authority over this industry, commercial banks, non-bank financial institutions, Forex bureaus and microfinance deposit institutions. As at 31 December, 2013, the banking sector comprised 43 commercial banks 14 of which are foreign owned, 1

mortgage finance company, 9 microfinance banks, 7 representative offices of foreign banks, 102 foreign exchange bureaus, 3 money remittance providers and 2 credit reference bureaus (Muteti, 2014). The dominants in the banking sector in Kenya are: Kenya Commercial Bank Limited, Co-operative Bank Limited, Equity Bank Limited, and Standard Chartered Bank Kenya Limited. The primary sources of regulation are the Constitution of Kenya, the Banking Act, the CBK as stated earlier, Microfinance Act, Risk Management Guideline, Prudential Guidelines, and Kenya Deposit Insurance Act; all as per their current year of enactment (Harwood, 2015).

This is one of the industries in the Kenyan economy that has undergone a lot of change and growth. Banks have expanded through increase in the number of branches, with others such as Equity Bank Limited going regional, and venturing into more business such as the insurance industry. With technology, so has “mobile banking” been birthed. This has increased accessibility and made it easy for people to utilize banking services.

2.3.1 Risks that face the banking industry

Increased complexity in the dynamics of the financial market, business environment, and increased regulatory requirements for banks have made it harder to design the right course of action for continued success since risks have continued to emerge and evolve. Risk is the probability of deviation of results from the expected and it may be positively or negatively. In their book, *Practical Risk Management*, Erik Banks and Richard Dunn came up with the ten questions a board or the CEO ought to be able to answer of which this study finds quite relevant in the holistic risk management (Banks & Dunn, 2003). These questions cover the top 10 specific risks that the board should be accountable of in the journey towards creating transparency and enhancing simplicity at the same time thus bringing in the marriage between ERM and the board (Banks & Dunn, 2003).

There are five main types of risks that face financial institutions and banks especially. Credit risk is the probability that a debtor or issuer of a financial instrument whether an individual, a company, or a country will default in repaying the principal and other investment-related cash flows per the terms specified in a credit agreement (Muteti, 2014). The development of the derivatives markets is bound to increase the scope of credit risk which affects a bank’s liquidity position in the event of its occurrence,

Interest rate risk is an expensive risk whereby it increases the vulnerability of a company to interest rate changes in terms of corporate debt and especially short-term debt (Muteti, 2014). Foreign exchange risk is variations caused by currency value changes to a bank that especially handles international business. Capital management risk is the risk associated with capital requirement which is a regulation provided by the Basel Accords the financial institutions (Muteti, 2014). Lastly, liquidity risk which is the risk associated with a bank's ability to efficiently accommodate the redemption of deposits and other liabilities, and to cover funding increases in the loan and investment portfolio (Muteti, 2014).

2.4 Corporate Governance and ERM: The role of the board

The focus on corporate governance has generally provided more than enough room for changes in corporate risk management whereby Companies with poor corporate governance practices have equally poor risk management skills, and the converse being also true (Lam, 2003). Regulatory and industrial initiatives such as the Turnbull Report, United Kingdom, and the Dey Report, Canada, have enhanced and increased the importance of corporate governance (Lam, 2003). COSO's framework highlights four areas that the board's contribution is core in implementation of ERM and they are: understanding and formulating the organisation's risk philosophy and appetite, review of the portfolios of risks, appraisal of these risks, and oversight of key risk exposures.

Corporate governance has progressively gained importance in Kenya due to several reasons among them being corporate failure and poor performance of public and private companies (Jerry Goodstein, 1994). It is believed that the first corporate governance framework in Kenya was in 1999 by the Center for Corporate Governance Kenya which developed a framework that was voluntary for companies to adopt. This framework was then taken up by the Capital Markets Authority (CMA) in 2000 as draft corporate governance practices for listed companies in Kenya. CMA later made it mandatory for listed companies to adopt those corporate governance practices that mainly tackled issues to do with the board such as board composition, role of audit committee (Jerry Goodstein, 1994). The banking industry in Kenya is highly regulated where the Central Bank of Kenya specifies the corporate governance practices to be adopted by all commercial banks operating in Kenya.

Corporate governance is an important component of ERM as it provides for the top-down management of risk by ensuring that the board of directors and management have established the appropriate risk management processes and control measures across the organization (McCrae & Balthazor, 2000). The purpose of ERM is to create, protect, and enhance shareholder value by managing the uncertainties associated with achieving the organization's objectives and so is the main responsibility of the board bringing in their utmost significance and relationship in this study (Financial Reporting Council, 2005).

Most of the corporate governance principles such as those under the reports stated above clearly show that directors are directly responsible for initiating the foundations of a systematic approach to corporate risk management and risk-based approaches to internal control (Lam, 2003; McCrae & Balthazor, 2000). Several aspects of ERM are, such as setting the risk appetite and establishing the organization's culture, are closely allied to the work of the board. ERM frameworks recognize that the ultimate responsibility of risk management lies with the board of governors and top management especially, then trickles down to the entire organization (Berger, Kick , & Schaeck, 2012). An organization with a good ERM framework has its BOD fully involved in their risk management process.

2.4.1 Responsibilities of the board

A proper risk process demands accountability hence assigning various respective responsibilities and enforcing them creates culpability. According to Banks & Dunn, (2003), the ultimate risk management responsibility for a given organization rests with the CEO and the board of directors. This scrapes off any opportunity for ignorance and ensures clarity. It is important for the top senior management levels to get the process right and keep it right (Lam, 2003). Failure to drive responsibility from the very top of an organization undermines the entire process as the rest of the team will not take it with the seriousness it deserves. Various reports, such as the Turnbull Report (2005), have laid down principles and policies that clearly outline the roles and responsibilities of every stakeholder in risk management with an insistent focus on the part board members ought to play in this (Financial Reporting Council, 2011). The reports outline the role played by the board in the implementation of a successful ERM framework (Banks & Dunn, 2003; Lam, 2003; McCrae & Balthazor, 2000; Financial Reporting Council, 2011).

2.5 Board composition and board diversity

In order for a given board to carry out its roles and responsibilities efficiently and effectively, its composition should be carefully and strategically drawn. Various factors put forward by Ekadah & Mboya (2009), Pfeffer (1992), Jerry Goodstein (1994), and Mahadeo, Soobaroyen, & Hanuman(2012) include the size, educational qualification, age, and gender among others depending on the organization size, industry, publicly trading, etc., as among those vital aspects that ought to be at the nerve center of a board construction. It is in this respect that diversity comes into play in the members of the board of directors and in the context of this study, board diversity in terms of size, gender and educational qualifications in relation to implementation of ERM.

Board diversity can indirectly or directly benefit an organization by either significantly constraining a group's efforts to take decisive action (Jerry Goodstein, 1994), especially the board's efforts to initiate strategic change in times of environmental turbulence, or by contributing to a more thorough decision-making process through provision of different experiences that enable a more extensive analysis of issues at hand (Berger, Kick , & Schaeck, 2012). Heterogeneity and homogeneity in a board of directors each have a two-fold effect on their roles and responsibilities.

2.5.1 Board size

Researchers have indicated to several ways in which board size enhances the organizational and governance functions of the board. Large boards have shown to have a positive influence by increasing the pool of expertise and resources for the organization (Pfeffer, 1992) and also, they may enhance corporate governance by reducing CEO domination and making it more difficult for the CEO to build a broad consensus within the board to take actions that might not be in shareholder interests. On the other hand, increased size can significantly inhibit the board's ability to initiate strategic actions as well as encounter several barriers in reaching a consensus on important decisions such as less cohesion that comes with larger group decision making and decreased levels of motivation and satisfaction due to the lack of participation (Jerry Goodstein, 1994).

Research has shown that larger boards are less likely to become involved in strategic decision making, are more difficult to coordinate due to the large number of potential

interactions among group members, and the nature of decisions made by board of directors are pertinent to be more unfavorably affected by large group dynamics (Jerry Goodstein, 1994). Deregulation and governance in the banking industry generally support the shrinkage of the board size and increase in outside representation on boards of directors resulting in less free-riding and promote more rapid decision making, factors that are of relevance in a deregulated environment (Lehn, 1997).

2.5.2 Board composition and gender

Gender is disputably the most longstanding and debated element of board composition with several studies under its belt which explain the competitive benefits that can be enjoyed by firms employing women on boards of directors (Mínguez-Vera, Campbell, & Antonio, 2008) among other benefits.

The disparity between women and men regarding prevalence in top management positions still prompts debate and study as to the extent of systematic bias against female managers and professionals as they seek positions of increasing authority and responsibility (Philpot, 2007). Whether women possess unique skills, expertise and experience that lead to their appointment to some committees and not others are an empirical question and evidence exists that women's characteristics and corporate behavior are evaluated differently from men's (Jago, 1982).

Arguments for greater female boardroom representation can be split into two categories; ethical and economic. Ethical category argues that it is immoral for women to be excluded from corporate boards on the grounds of gender and that firms should increase gender diversity to achieve a more equitable outcome for society (Mínguez-Vera, Campbell, & Antonio, 2008). Greater female representation should be regarded not as a means to an end but as a desirable end in itself. Economic arguments are based on the proposition that firms which fail to select the most able candidates for the board of directors damage their financial performance (Mínguez-Vera, Campbell, & Antonio, 2008).

There are also arguments that greater gender diversity may serve to reduce firm performance. A number of research suggests that homogeneous groups are more cooperative and experience fewer emotional conflicts. Greater gender diversity among board members generates more opinions and critical questions, and as a result more

conflicts, decision-making will be more time consuming and less effective ((Lau, 1998; Mínguez-Vera, Campbell, & Antonio, 2008).

A study carried out on UK corporate boards recorded results that the highest rates of female directors are associated with sectors associated with a close proximity to final consumers, i.e. retailing, banking, the media and utilities, whereas producer-oriented sectors such as resources, engineering and business services that are characterized by isolation from final consumers and male-dominated workforces, have significantly fewer female directors (Mínguez-Vera, Campbell, & Antonio, 2008).

Findings show that women tend to serve on better performing boards with evidence shown in the Catalyst 2004 reports on 353 Fortune 500 companies in the United States over the period of 1996-2000. It was found that companies with the highest representation of women on their top management teams had a 35% better return on equity and 34% better total return to shareholders than those companies with the lowest female representation (Mínguez-Vera, Campbell, & Antonio, 2008) Attracting more women to serve on company boards requires that they have the educational opportunities and skills necessary to compete with male counterparts.

2.5.3 Board diversity and education

Many directors engage in occupations and activities that have little in common with their original professional or academic studies which could be explained by the fact that most corporate governance codes encourage the creation of board committees with specific strategic-led mandates, such as audit control and human resource, which implies that the board of directors should be drawn from a number of professional or educational backgrounds (Mahadeo, Soobaroyen, & Hanuman, 2012). There is little evidence however of the relevance of occupational and the educational background of board members in the short-term performance of an organization whilst a negative correlation to long term performance manifests according to (Murray, 1989).

With the increasing complexity in business environment, a wide array of knowledge and occupations is important as boards need to tackle with the multiple dimensions of a business' decision, e.g. financial, human resource, legal, and ethical, environmental. Greater diversity in educational and functional background leads to better decision-making

and provides the potential for faster and in-depth assessments of the implications of decisions at the board level and address any information asymmetry issues between the board and senior management.

The underlying factor that led to the collapse of Rolls Royce in the 1970s (Argenti, 1976) was the fact that the board was dominated by engineers with little concern for the financial implications of the company's fated research and development activities and there was very little representation of accounting and finance backgrounds on the board. However, the oil industry is a special case where a homogeneous board dominated by engineering-educated directors would perform better (Mahadeo, Soobaroyen, & Hanuman, 2012).

CHAPTER THREE

3. METHODOLOGY

3.1 Research design

This is a correlational study as it is seeking to analyze the relationship between board composition and ERM. The rapidly changing economic environment due to globalization of business and deregulation has made it significant for businesses to change their way of running business in order to fit in the new environment and enhance their sustainability. The search for the link between leadership in relation to the BOD and ERM in order to optimize their exploitation, is thus very relevant. This relationship is analyzed over an eight-year period from 2008 to 2015. This period serves as a rich source for this analysis since the effects of the changes and recommendations adopted, such as increased participation of the BOD in corporate governance, after the financial crisis are be immediately felt.

Regression is applied in this study as it is a popular method with researchers in this field (e.g. Hoyt & Liebenberg (2008), Golshan & Rasid (2012), Wachudi & Mboya (2012), Scherbina, Afanasieva, & Lapina, (2013), (Keasey & Kevin, (2008)) . Diagnostic tests are carried out on the panel data in order to determine which panel model to use between pooling, fixed effects and random effects (Altuntas, Berry-Stölzle, & Hoyt, 2011). The specification test is also carried to establish whether to use the random effects model and the fixed effects model.

3.2 Population and sampling

The population used in this study was from the banking industry, Kenyan banks that are listed at the Nairobi Securities Exchange (NSE). This is because publicly trading companies have their data and information available to the public as required by regulations such as the CBK prudential guidelines . This is done for the period between 2008 and 2015. There were a total of 10 banks but 4 banks were however eliminated from the population as they had incomplete data for the time period under consideration.

3.3 Data collection methods and variables

The data used for this study were obtained from secondary sources. Secondary sources incorporated financial and board composition data from financial statements of these banks. This was because this data is available and easily accessible from the Capital Markets Authority (CMA) and the respective company websites. ERM is measured in terms of financial performance of the listed banks. The study uses return on equity (ROE) and operating income (OI) as its performance ratios.

The size of board of directors of the various banks is manually taken down for from these companies' financial reports. Diversity in term of education is characterized in terms of the different types of functional backgrounds presented in each company's board. This is categorized in five bands where a company is assigned a band of 1 where only one educational background is present and a maximum of 5 where all backgrounds are present. These bands comprise of educational backgrounds in: business; engineering; finance and economics; law and political sciences; and accounting.

The variables used in this study

Variable	Definition
ROE	Return on equity which is net income divided by net assets.
OP	Operating profits which is net income from continuing operations.
Board number	The total number of individuals in the BOD.
Gender	This is represented by the number of female directors in the BOD.
Education	The occupational expertise present in the BOD as shown by the number of educational backgrounds present.

Table 2: Variables used in the study. A description of the variables used as indices for ERM in the study.

3.4 Measuring variables

3.4.1 Measuring board diversity

Species richness which is the number of species in a community or region will be measured in terms of heterogeneity and evenness. In this context, species will refer to board of

directors. Diversity in terms of gender will be analyzed using a diversity index as applied also by Hagendorff & Keasey (2012) who used the Herfindahl-type index and Hillman, Cannella, & Paetzold (2000). The Shannon's diversity index (1948) (Magurran, 2003) that will be used to calculate gender diversity is given by:

Equation i

$$H = - \sum_{i=1}^N p_i \ln p_i$$

Where;

H - Shannon's diversity index,

N - total number of individuals in the community, which is the board of directors in this case, and

p_i - proportion of N made up in the i^{th} individual.

For evenness, Shannon's equitability (E_H) is applied where a value between 0 and 1 is assumed with 1 being complete evenness.

Equation ii

$$E_H = H/H_{max} = H/\ln N$$

3.4.2 Measuring ERM

ERM creates value in a firm as evidenced by the extensive research undertaken by Kraus & Lehner (2012) hence the study measures ERM in terms of financial performance of the listed banks, a method applied by Yegon, Mouni, & Wanjau (2014). With the major aim of this study in mind, numerous research done on board diversity are in relation to firms' performance as seen in empirical study by Ekadah & Mboya (2009) and Kilic (2015). The study thus adopts Return on Equity (ROE) and Operating Income (OP) as measures of ERM and this is additionally supported by the methods adopted by Hoyt & Liebenberg (2008) and Scherbina, Afanasieva, & Lapina (2013).

Equation iii

$$ERM = f(ROE, OP)$$

3.4.3 Control variables

Financial theory suggests that the dependent variable is influenced by more than one independent variable. The logarithm of operating income was used for reliability of the results. As for the number of women in gender diversity, the proportion of women to the total number of board members was used. Dummy variables were used in addition for the board size where small, medium and large boards were grouped in order to deduce results in even a more reliable way.

3.5 Model specification

A panel model is adopted for the analysis of the relationship between ERM and board composition of listed banks in Kenya.

Equation iv

$$Y_{it} = B_{yxt}X_{it} + B_{yzt}Z_i + \lambda_t\eta_i + \varepsilon_{it}$$

Where;

$$i=1 \dots N; t=1 \dots T$$

Y_{it} – the value of the dependent variable, ERM;

X_{it} - the vector of time varying covariates;

B_{yxt} - the row vector of coefficients;

Z_i – the vector of time invariant covariates;

B_{yzt} - the row vector of coefficients;

λ_t - coefficient of the latent time-invariant variable;

η_i – a scalar of other time-invariant variables, and

ε_{it} - the error term or random disturbance.

CHAPTER FOUR

4. DATA ANALYSIS

4.1 Introduction

The analysis was done on the panel data of 10 Kenyan banks that are listed in the Nairobi Securities Exchange (NSE) on 48 observations divided in 6 groups. This number however reduced to 6 due to unavailability and unreliability of data from some of the banks. The independent variable in the model is board of directors' composition in terms of board size, educational qualifications going under the term education bands, and the number of women in each board to meet the gender aspect. The dependent variable is ERM which in this study was measured in terms of performance ratios in return on equity (ROE) and operating profit (OP). The control variables are the logarithm of OP; proportion of women; and large, medium and small to categorize the board size. This is then regressed to analyze the results.

4.2 Shannon's diversity test

The Shannon's diversity test was carried out on gender and education aspects of boards. The equitability aspect of the index assumes a value between 0 and 1. The lower the value the more the diversity and the converse is also true. Diversity based on gender scored an average of 0.8 and education 0.6. these are both considerably high values hence low level of diversity in accordance to Shannon's diversity index. When rounded off to the number, a diversity of 1 is achieved all through.

Company	Education Diversity	Gender Diversity
Diamond Trust Bank Kenya Limited	0.595	0.880
Housing Finance	0.406	0.750
Standard Chartered Bank	0.604	0.644
Equity Group Holdings	0.570	0.708
Cooperative Bank	0.661	0.761
NIC Bank Limited	0.564	0.880

Table 3: This table shows the Shannon's diversity index in terms of gender, number of women in the BOD, and education, in terms of number of education backgrounds found in the board.

4.3 Diagnostic tests

One important decision when using a panel data approach regards which type of panel model to use: pooling, fixed effects and random effects. The Random Effects estimator is consistent and asymptotically normally distributed under fulfilled assumptions of model linearity, independence, strict exogeneity, no autocorrelation, unrelated effects and constant variance of the individual specific effect.

The Fixed effects estimator is unbiased under assumptions of model linearity, independence, strict exogeneity and no perfect collinearity in small samples. Assuming no serial correlation and normally distributed idiosyncratic errors, it is normally distributed in small samples. The pooled OLS estimators are unbiased under fulfilled assumptions of model linearity, independence, strict exogeneity and unrelated effects in small samples. Additionally, assuming and normally distributed idiosyncratic and individual specific errors, it is normally distributed in small samples.

We use the F-Test to investigate the presence of pooling versus fixed effects, the Breusch-Pagan Lagrange Multiplier (LM) Test to investigate the presence of pooling versus random effects and Hausman Test to investigate the presence of random effects versus fixed effects.

4.3.1 F-Test: pooled vs fixed effects

Under a pooled regression, it is held that the fixed effects are zero, this is the null hypothesis. This hypothesis is tested by an F test, which is based on loss of goodness-of-fit. If the null hypothesis of the F-test is rejected, a fixed effect model is favored over OLS. This was ran on the two models and they both had p-values of 0 hence fixed effects model were favored.

4.3.2 Pooled vs Random Effects: The Breusch-Pagan Lagrange Multiplier (LM) test

We use the LM test to decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across entities is zero, i.e. no panel effect. If the null hypothesis of the LM test is rejected, a random effect model is

better than the pooled OLS. When run on the two models, ROE had a z-value of 0.233 and 0.000 for OP. ROE thus was in favor of pooled effects whereas OP was in favor of random effects. Fixed effects are adopted when against pooled effects hence ROE took up the fixed effects model. As for OP, the Hausman test was carried out to decide between fixed and random effects.

4.3.3 Hausman test

We conduct the Hausman test when both hypotheses of the F-test and LM test are all rejected. We run both the Fixed Effects Model and the Random Effects Model and implement the Hausman test to choose which model gives consistent estimates. Hausman tests the null hypothesis that the extra orthogonality conditions imposed by the random effects estimator are valid, therefore that the Random Effects model provides consistent estimates. The fixed effects estimator, which does not impose those conditions, is consistent regardless of the independence of the individual effects. The fixed effects estimates are inefficient if that assumption of independence is warranted. The random effects estimator is efficient under the assumption of independence, but inconsistent otherwise. A z-value of 0.0545 was recorded for OP and the difference in coefficients were not systematic hence random effects model adopted.

4.4 Relationship between ERM and board composition

Board size, gender representation, and educational qualification are seen to influence the board composition since their p-values are less than 5%. The chi squared test that F-test values are consecutively zero showing that the models are significant. R^2 of 0.132 indicates that ROE accounts for 13% of the total variance in the relationship between ERM and BOD composition. A coefficient of 0.054 means that for every unit increase in ROE, there is a 0.054 unit increase in the size of the board is predicted, holding all other variables constant. The values for medium board are omitted because of collinearity. There is little effect of board composition on ROE but size of the board has the highest effect.

Variable	Coefficient	P> t
Small board	0.004	0.891
Medium board	-	-

Large board	0.054	0.075
Proportion of women	-0.174	0.342
Education bands	-0.024	0.304
Probability > F	0.0025	
Average R-squared	0.132	

Table 4: Fixed effects model results for the regression of board composition and the ERM variable, ROE. The coefficient indicates the volatility between the two whereas t-values indicates the level of significance of the variables.

OP is observed to influence the board composition as the p-values are less than 5%. The chi square test is simultaneously zero showing that the model is significant. R-Squared is the proportion of variance in the dependent variable which can be explained by the variables. An R^2 of 0.440 means that this model accounts for 44% of the total variance in BOD composition on ERM implementation. A coefficient of 3.809 means that proportion of women has 3.809 effect to ERM in terms of OP. In addition, at the p-value of this coefficient is significant hence it can be concluded that women representation has the highest effect as compared to the other variables.

Variable	Coefficient	P> z
Small board	-0.374	0.088
Medium board	-	-
Large board	0.194	0.390
Proportion of women	3.809	0.005
Education bands	-0.099	0.565
Probability > χ^2	0.000	
Average R-squared	0.440	

Table 5: Random effects model results for the regression of OP and BOD composition. The coefficient indicates the volatility between the two and the t-value indicates the level of significance.

CHAPTER FIVE

5. Conclusion and Recommendations

The banking industry is a pillar of the financial industry and the economy at large. It is an industry associated with high risk and for this, decisions that are made should take into consideration various aspects that they are intertwined with (Berger, Kick, & Schaeck, 2012). It is for this that enterprise risk management (ERM) and its implementation ought to be taken with utmost seriousness. This is especially important for the Kenyan economy which is a developing one as have developed economies have with others such as the United States making it a mandatory requirement.

From the data analysis done above, the study found that boards in the Kenyan listed banks are not diversified in terms of gender despite measures such as the gender quota share being enforced. Women representation in boards is very minimal as the majority of boards having two female directors and a maximum of 4. Diversification in terms of education is also low though it is better with most boards having a minimum of 3 out of 5 educational backgrounds present.

The board size is the component that made the highest contribution towards ERM implementation in the banks. This may be because there's a legal requirement of the minimum number that should make up a board. Educational qualification made an average but still vital contribution to the study's quest. This is because most board members are appointed based on their experience and economic value and not necessarily their educational qualifications, a factor which is considered in lower management. Women proportion was observed to not affect operating profits but not return on equity which may be explained by the small sample of the study.

This research recommends that further studies be done on this topic since this is an issue that will be of more than considerable relevance if it has not already especially in Kenya. More studies also need to be done on the level of ERM implementation in the banking industry and in addition offer customized guidelines on how to go about this in connection to corporate governance in an economy like the Kenyan economy.

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Appendices

Appendix 1: Fixed effects model results for the regression of board composition and the ERM variable, ROE. The coefficient indicates the volatility between the two whereas t-values indicates the level of significance of the variables.

Variable	Coefficient	P> t
Education bands	-0.037	0.083
Board number	0.013	0.022
Proportion of women	-0.225	0.209
Probability > F	0.0014	
Average R-squared	0.132	

Table 6: ROE fixed effects model results.

Appendix 2: Random effects model results for the regression of OP and BOD composition. The coefficient indicates the volatility between the two and the t-value indicates the level of significance.

Variable	Coefficient	P> z
Education bands	0.002	0.990
Board number	0.086	0.059
Proportion of women	3.526	0.014
Probability > chi ²	0.000	
Average R-squared	0.434	

Table 7: Hausman random effects model results on OP.