

**Determinants Influencing the Likelihood of Risk Management Strategies
Adoption by Pension Schemes in Kenya**

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DECLARATION

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

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DEDICATION

To my brother Mr. Samuel K. Aiyabei, who sacrificed a lot for my education.

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This accomplishment has been the fruit of a long journey, during which I have incurred debts to a wide range of people who made my dream a reality. It is with God that I can do all things, thus my first thanks is to the almighty God my creator who has enabled me to come this far in my studies and giving me peace of mind, Grace and good health in preparing this thesis. Glory and honour almighty God.

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ABBREVIATIONS AND ACRONYMS

BOT	Board of Trustees
CBA	Cost Benefits Analysis
CBK	Central Bank of Kenya
COSO	Committee of Sponsoring Organization of the Tread way Commission
CRO	Chief Risk Officer
DB	Defined Benefits
DC	Defined Contributions
ERM	Enterprise Risk Management
EWRM	Entity Wide Risk Management
IOPS	International Organization of Pensions Supervisors
ISO	International organization of Standardization
NCLR	National Council for Law Reporting
NSSF	National Social Security Fund
KRBA	Kenya Retirement Benefits Authority
KRA	Kenya Revenue Authority
OECD	Organization of European Community for Development
PSPS	Public Service Public Scheme
RMS	Risk Management Strategies
RoK	Republic of Kenya
SPSS	Statistical Package for Social Sciences
USD	United States of America Dollars
UK	United Kingdom

ABSTRACT

Pension schemes play a fundamental role in an economy as the driving stimulant of savings, liquidity and robustness of capital markets. The current value of assets in the Kenya pension sector is about 17% of the Kenya's Gross Domestic Product (GDP). The pensions sector provides employment directly, mobilizes savings for investment, reduces dependency and reduces poverty index by offering retirement income to the aging population. The Kenyan constitution promulgated in the year 2010 has made pensions provision and choice as part of the citizens' fundamental rights. It is thus imperative that the pensions sector not only focuses on ways of maximizing returns but also focus on pensions risks management. This study sought to explore the determinants influencing the Likelihood of adopting risk management strategies by pension's schemes in Kenya. The guiding objectives of this study were to find out the influence of Board of trustees composition, pension scheme size, regulatory framework, portfolio structure and administration structure of the pension schemes on the Likelihood of adoption of risk management strategies. The study design was descriptive survey. The target population was one thousand two hundred and sixteen (1,216) occupational pensions schemes registered with the Kenya Retirement Benefits Authority and stratified random sampling was used to select 192 representative sample of the population. Data was collected using observation, personal interviews and questionnaires and analyzed using Logistic Regression Model. The study findings showed that all the five variables had significant influence on enhancing the Likelihood of adoption of risk management, with the structure of pension administration found to be the major driver in influencing the Likelihood of adopting risk management.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

This study sought to explore the determinants of adopting risk management strategies by the Pensions Schemes in Kenya. Pension Schemes are big investors which play a central role in ensuring the effectiveness, liquidity and robustness of capital markets around the world (Clark, Morril & Allen, 2010). Pension funds play an important part in provision of adequate income in retirement. They are also important players in the wider economy, given their large asset and liability bases thus it is in the public interest that they be managed efficiently and effectively, as well as in the interest of their beneficiaries and sponsors (Kemp & Patel, 2011).

Risk management of pensions scheme are viewed as part of the firm's financing policy and thus increase an economies investment value through its effect on investment policy, contracting costs, and the firm's tax liabilities (Myers, 2008). This study aimed at shading light on enhancement of risk management in the pension sector which is a crucial sector of the Kenyan economy given that the value of assets constitute about 17% of GDP.

1.1.1 Global pension schemes perspective

According to the Global Pensions Assets Report (GPAR), pension assets value for 13 leading pension markets in the world at the end of the year 2011 were 27,509 billion USD representing a 3.9% rise of the asset value from the year 2010 (GPAR, 2012). The three largest world pension markets in ascending order are the United States of America (16,080 billion USD), Japan (3,363 billion USD) and UK (2,394 billion USD) with each of the countries posting assets growth rates of 5.9%, 2% and 5% respectively from the year 2010 to

the year 2011 and together these three countries control 80% of the assets of the top 13 world pension markets (GPAR, 2012).

A Towers Watson (TW) pension's study report showed that the ratio of Global Pension Assets to Gross Domestic Product (GDP) declined from 75.5% in the year 2010 to 72.3% at the end of 2011 down from the peak of 78.9% in 2007 and on contribution to GDP the Netherlands had the highest percentage of pension assets contribution to GDP (88.8%) followed by USA (82.7%), Switzerland (78.1%), Malaysia (75%), UK (73%), South Africa (70%), and Canada (69%) (TW, 2011) from the year 2001 to 2011 (10 years), pension assets ratio to GDP grew the most in the United Kingdom at 25% growth rate and Hong Kong at 15% growth (TW, 2011). The growth of assets and risk levels varies from the Defined Benefits Scheme (DB) and the Defined Contribution Schemes (DC), with assets growth of 7.9% and 4.6% respectively for the 10 years period 2001 to 2011 (GPAR, 2012). The DC pensions assets at the end of year 2011 was 43.1% of the total pension assets compared to 42.8% in 2006 and 38.3% in 2001 showing an established trend of the growth of the DC schemes assets due to the investment risk responsibility for pension funds being shifted from the sponsor to the members of the pensions schemes (GPAR, 2012).

According to Pensions Fraud Risk Survey Report (PFRS) fraud in pension schemes rose from 12% to 19% in USA between June 2010 and June 2012 representing 55% increase within two years and that fewer than four-in-five trustee boards (79%) considered risk management in their governance, falling from 85% in 2011 (PFRS, 2012). The National Fraud Authority UK report (NFA) reported that a whopping 16.6 million pounds was lost due to poor risk strategies and in the UK between April 2011 and March 2012 (NFA, 2012). According to statistics available from the Ethical Investment Research Services (EIRIS), the year 2010

pension scandal in the UK led to debt of Great Britain Pounds (GBP) of four (4) billion and a GBP 441 million loss in its pension funds (EIRIS, 2012).

In the United States of America, the pension landscape is in a state of transition and the population is exposed to retirement risk and the global financial crisis of 2008 worsened the matters as with the extent to which pension schemes were exposed to risks, the public pension funds lost between 5 USD and 10 USD billion because of the financial crash which was particularly serious for older workers, who have less time to build up savings again, and have more trouble finding a new job (Stewart, 2010). The pension fund nominal returns in 37 selected OECD and non OECD countries following the 2008 financial crisis was on average negative fifteen point four percent (-15.4%) with big economies such as Ireland, Hong Kong and United States posting the worst relative returns at -35%, -30%, -23% respectively (Stewart 2010).

According to Eckles, Hoyt and Miller (2010), risk management does not only reduce earnings and cash flow volatilities, but also facilitates investors and regulators to evaluate and monitor firm performance and solvency risk. The 2008 financial crisis highlights that risk management is not only important to corporations but also to regulators and in the global economy as a whole. The topic of risk management has steadily moved up the agenda of both government and industry, to a level where it is more important than ever before (Lam, 2011). Pension Schemes development has run parallel with the evolution of regulatory frameworks for corporate governance in response to a series of well publicized corporate scandals and failures across the world (Collier & Ampomah, 2008). In the UK, Governance reforms in the financial sector such as the Sarbanes-Oxley Act in the US, the Basel II Capital Accord and the revised Combined Code of the year 2003 have minimized the risk of future major

corporate failures via tighter regulation of internal control systems (Collier & Ampomah, 2008).

In a study by the International Monetary Fund (IMF), pensions were found to be of high priority on the policy agenda in many developed countries and, increasingly, in developing countries also as a reflection that the demographic changes posts challenges for pension systems, whether pay-as-you-go or funded and modest adjustments to existing pension systems to manage risks and promote sustainability (IMF, 2009). According to Holzmann, Hinz and Dorfman (2012), the importance of pension systems to the economic stability of nations and the security of their aging population have increasingly been recognized by nations of the world at all levels of development and that the need to strengthen pension funds as driven by; the pressure of global aging, the erosion of family dependency, weakness in governance and administration of existing pension systems.

Pension schemes with weak sponsors and large deficits are more exposed risks particularly if the sponsor has significant influence over the affairs of the trustees (Kemp & Patel, 2011). A case was pointed out by Hatchett, Bowie and Forrester (2010) that pensions scheme risk in UK, in which a sponsor had a market capitalization of eighteen million GBP and the deficit in the scheme of GBP of 436 million with it being proposed that the scheme take over 90% of the company's shares led to the following issues; (a) Could the trustees have cut their losses earlier if they had adopted more effective risk management and not allowed the current situation to develop in the first place? (b) Is it practical to manage such a scheme as a significantly underfunded mutual, or does it need to address its financial position more comprehensively by cutting benefits if this option is available (Hatchett, Bowie & Forrester, 2010).

In Africa the major risk in the pensions fund are those of compulsory contributions and governance (Asher, 2007). Compulsory contribution is worse for the informal sector since it is enormously expensive and creates further inequality by acting as an additional tax on the financial and administrative resources of the poor (Asher, 2007). On the issue of governance, Barbone, Islam and Sanchez (2010) note that it is the first order of business for retirement reform in sub-Sahara due to inefficiency and corruption of many government structures and thus specifically having issue in pension arrangements. Statistics from Nation Master Report (NMR), shows that Africa makes up almost a quarter of the world's land surface, has one eighth of the world's people but is only 4% in economic terms on a purchasing power parity basis (NMR, 2010).

African economies are relatively small and often dependent on a single commodity, financial implying activities are volatile, and subject to periodic bouts of currency fluctuations and high inflation hence providing one explanation for extensive government intervention in the economy, with its consequential result being risk of corruption (Asher, 2007). Economic instability is also invariably linked to political risks (political volatility), which are common in African countries, and undermines the security that might be offered by a pension system. Pension provision in terms of coverage in Africa is higher in North Africa where it exceeds 80% of the workforce in Tunisia and Egypt (Barbone, Islam & Sanchez, 2010). According to Hatchett, Bowie and Forrester (2010), three countries in Africa (Mauritius, Botswana & Namibia) have universal pension schemes. Stewart (2010) argues that more than 40% of Africans over 64 years of age are still obliged to work and are not guaranteed of retirement income.

1.1.2 Pension Schemes in Kenya

Pension scheme risk management is significant area as recent regulatory changes have led to significant shift of risk in terms of scheme conversions employees in Kenya. The Kenyan government has instructed that all pensions' schemes sponsored by public service organizations to convert to defined contribution scheme from 1st July 2011 (RoK, 2010), so that the investment risk shifts from the sponsoring company to the members. Given this background, and the increasing impact of pensions on the business strategies of firms, it is natural to expect many risk management techniques used or available for use in the wider business and financial arena to be applicable to pension funds, this includes techniques associated with enterprise risk management. According to International Organization of Pension Supervisors (IOP), the coverage in terms of pension provision in Kenya less than 15% of the working population which is much lower than the leading countries such as Netherlands (80%), Australia 84% and Sweden 90% (IOPS, 2010). Kenya pension benefits provision in terms of coverage was ranked number 6 in Africa after Lesotho, Mauritius, Botswana, South Africa, Morocco (Ambrogio & Elisabetta, 2010).

Kenya's GDP as at the end of year 2011 was about 35 billion United States Dollars (USD) and the pension assets was about 5.9 billion USD, a 17% ratio to GDP (RoK, 2012). According to the Kenyan Retirement Benefits Authority (KRBA), there are five broad categories of pension's schemes in Kenya namely; the Civil Service Scheme, the National Social Security Fund (NSSF), Occupational schemes and Individual pension schemes. In the year 2011, there were, 1,288 registered retirement benefits schemes, 17 fund managers, 10 custodians, and 25 registered administrators as shown in Table 1 (KRBA, 2011).

Table 1.1: Number of Schemes, Fund Managers, Custodians and Administrators

	Dec -07	June -08	Dec -08	June -09	Dec-10	Dec-11
Retirement Benefit Schemes	1,279	1,280	1,285	1,266	1,284	1,288
Registered Fund Managers	13	16	16	17	17	17
Registered Custodians	5	6	6	10	10	10
Registered Administrators	13	23	23	24	22	25

Source: KRBA, 2011

According to the National Council for Law Reporting (NCLR), the provision and management of retirement benefits for public service employees in Kenya is governed under the Pensions Act enacted in 1942 to provide for the grant and regulating of pensions, gratuities and other allowances in respect of the public service of officers under the Government of Kenya (RoK, 2009). The PSPS is not funded and operates on a defined benefits pay as you go basis. The Scheme provides a pension of 2.5% of final basic salary for each year of service on retirement from service at 55.

According to the Centre for Governance and Development (CGD) the greatest challenge facing the NSSF has been its bad investment profile characterized by lack of diversity such that 42% of the total assets of the fund are held in real property as compared to 9% of the total assets of other occupational schemes in Kenya, and there recommended 30% (CGD, 2009). An additional 7% are invested in bank deposits with 16 financial banking institutions of which 10 have since collapsed, thus, locking up 4.6% of the total fund assets. In the year 2002, the fund lost Kenya Shillings 256 million in the Euro Bank scandal due the fact that the Board of Trustees of the fund, who makes investment decisions, has no comparative advantage in fund management and is vulnerable to political interference (CGD, 2009).

1.1.3 Risk management practices of pensions schemes in Kenya

One of the risks facing pension schemes are poor record keeping has also been a major undoing of the pension scheme, the result has been an unallocated suspense account of approximately seven billion Kenya Shillings (RoK, 2010). As a strategy to mitigate this risk, KRBA (2011) the pension administration regulations were developed and made mandatory for pensions schemes to comply. The NSSF was ranked number one in membership constitute 67% of the membership with membership of 850,000 followed by the civil service pension scheme which has 22% of the membership. Occupational and individual Retirement Benefits Schemes have 10.4% and 0.6% of membership respectively. The Kenyan pension provision and management scheme was transformed in 1997 with an enactment of the Retirement Benefit Act legislation which established a specialized agency, the Retirement Benefits Authority (KRBA) with the core functions of advising the government on pension matters and supervises the pension schemes in Kenya (RoK, 2009).

Kenyan pension funds face a number of risks that may put in doubt their sustainability in paying adequate promised retirement benefits to their members and attainment of the economic pillar under the Kenya's long-term strategic plan vision 2030 which envisions Nairobi to be the financial sector hub in Africa (KRBA, 2011). The pensions industry is a key driver of mobilization and channeling resources for investment through the Capital Markets and thus influences the financial sector which constitutes the banking sector, capital markets sector and insurance sector (RoK, 2009). According to the Central Bank of Kenya Report (CBK), the Retirement Benefits Authority implemented a risk based supervision model which measures the level of compliance to the regulations by the registered pension's schemes by use of an interrogative questionnaire (CBK, 2011).

1.2. Statement of the problem

According to the Global Competitive Index (2012), Kenya was ranked number 102 out of 142 (102/142) in the year ended 2011 which was a four point improvement from position 106 out of 139 in 2010 in economic performance and embracing of risk management. At position 102/142, Kenya was in the tenth position among the 32 African countries covered by the Global Competitive Index Survey (GCI) behind; Tunisia number 40/142, South Africa number 50/142, Rwanda number 70/142, Namibia 83/142, Algeria 87/142, Egypt number 94/142 and Gambia number 99/142. In spite of Kenya's relatively good ranking in Africa, Kenya's coverage on provision of pensions is about 15% of the working population even though Kenya established the Retirement Benefits Act one and half decades ago (RoK, 2011). The Kenya Retirement Benefits industry has largely been stagnant for the last five years in terms of pensions schemes registered with the regulator from the information available in the background of this study.

In the year 2011, fourteen (14) pension schemes were wound up and another six (6) were put under interim administration as at June 2011 (KRBA, 2011). Pension Schemes in Kenya are exposed to market risk, operational risk, governance risk, sponsor insolvency risk and counterparty fraud risk (KRBA, 2011). The risks in the pensions industry in Kenya are on the rise as evidenced by the suing of the heads of Kenya Railway Retirement Benefits scheme for misappropriating pension scheme funds and appointment of an interim administrator and put the trustees of Pyrethrum Board of Kenya pension trustees to account for the inability to pay retirees benefits (RoK, 2011; RoK, 2012). The thesis of this study was premised on determinants influencing the likelihood of adopting risk management strategies to stem the tide of losses, fraud and ultimate collapse of occupational schemes in Kenya.

Empirical studies find pension risk management adoption and governance lapses across the world. Yermo and Severinson (2010) document the ineffectiveness of the pension risk management strategies in Hungary in enforcing stakeholder's rights, Clapman (2007) show evidence of the lapses on the drivers for adoption of risk management in USA, Ambachtsheer, Capelle and Lum (2007) document the risk management adoption challenges in Australia, Canada, New Zealand, UK and USA. Dias (2006) points out the adoption of risk management problem in Brazil and Daud, Yazid and Hussin (2010b) found the problem of Enterprise Risk Management strategy adoption in Malaysia. While the studies address the prevalence of risk management gaps in developed countries, there exist a gap on the drivers influencing adoption of risk management strategies in a developing country. This study aims at filling this gap in existing literature by addressing the determinants influencing the Likelihood of adoption of risk management strategies by the pension schemes in Kenya.

1.3. Research objectives

1.3.1 General objective

The study sought to explore the determinants influencing the Likelihood of adopting risk management strategies by pension schemes in Kenya.

1.3.2 Specific objectives

- i. To examine if composition of board of trustees influences the chances of adopting risk management strategies by pension schemes in Kenya.
- ii. To establish how pension scheme size effect on the probability of adopting risk management strategies by pension schemes in Kenya.
- iii. To analyze the influence of the regulatory framework on the likelihood of adopting risk management strategies by pension schemes in Kenya.

- iv. To assess the influence of schemes' asset portfolio on the likelihood of adopting risk management strategies by pension schemes in Kenya.
- v. To find out the influence of pension schemes administrative structure on the possibility of adopting risk management strategies by pension schemes in Kenya

1.4. Research Hypotheses

The study sought to test the following hypotheses:

- i. H₀: The composition of board of trustees does not influences the chances of adopting risk management strategies by pension schemes in Kenya.
- ii. H₀: Pension scheme size does not affect the probability of adopting risk management strategies by pension schemes in Kenya.
- iii. H₀: The regulatory framework does not influence the likelihood of adopting risk management strategies by pension schemes in Kenya.
- iv. H₀: Portfolio structure does not influence the likelihood of adopting risk management strategies by pension schemes in Kenya.
- v. H₀: Pension schemes administration structure does not influence the likelihood of adopting risk management strategies by pension schemes in Kenya

1.5. Justification of the study

Pension schemes that adopt risk management strategic practices such as Enterprise Risk management (ERM) are able to better understand the aggregate risk inherent in different business activities and provide them with a more objective basis for resource allocation, thus improving capital efficiency and return on equity (Meulbroek, 2002). Organizations with a wide range of investment opportunities are likely to benefit from being able to select investments based on a more accurate risk-adjusted rate than was available under the

traditional risk management approach (Meulbroek, 2002). A further source of value from adoption of risk management programs arises due to improved information about the pension's scheme risk profile without which regulators and other stakeholder are more likely to have difficulty in assessing the financial strength and risk profile of a pension scheme that is highly financially and operationally complex. Risk Management enables these financially opaque firms to better inform outsiders of their risk profile and also serves as a signal of their commitment to risk management. By improving risk management disclosure, risk management is likely to reduce the expected costs of regulatory scrutiny and external capital (Hoyt & Lieberberg, 2009). This study will explore the determinants influencing Likelihood of adopting risk management strategies in the pension sector, which in turn work towards the growth of the sector.

The outputs from successful risk management adoption include compliance, assurance and enhanced decision-making. The results provide benefits by way of improvements in the efficiency of operations, effectiveness of tactics (change projects) and the efficacy of the strategy of the organization. On the determinants of adoption of risk management sought to fill the gaps phenomenon of risk management in the pension's scheme sector, the findings of the study provides useful guidance to pension schemes in mitigating risks and enhance sustainability and confidence with members. The study also may guide the government and in particular the Retirement Benefits Authority to evaluate the risks based on the Risk Based Supervision model. The finding opens up increased understanding on the interplay between capital markets regulation and the dealing with institutional pension investors in the capital markets. Research scholars may also gain from both the theoretical and empirical findings on the risk management adoption by the pension's schemes in Kenya which can form a basis of replication in other countries.

1.6. Scope of the study

The drivers of adopting risk management strategies in the pension sector, specifically the occupational pension schemes registered by the Kenya Retirement Benefits Authority (KRBA) was the focus of this study, in line with the research objectives enumerated in section 1.3. Occupational pension schemes are particularly interesting as they differ from public corporations because they are immune from mechanisms such as takeovers as is the case with corporate entities. Pension funds are also a unique sector since the ultimate beneficiaries are ‘locked up’ such that they cannot exit from a fund due to poor performance. The study will not cover other social security benefits provisions such as the National Social Security Fund, National Hospital Insurance Fund, Public service pension’s schemes and Individual Pensions schemes. These categories of pension provision could not be included because of economic and logistical resource constrain.

1.7. Limitations

The major constraints that were encountered in this study were restrains and confidentiality from the potential respondents to the questionnaire for self-edification. The bureaucracy in the pension scheme sector could have led the respondents’ hence subjectivity. Pension’s regulations being a relatively new phenomenon in Kenya, the respondents may fear to respond in areas where they are not meeting regulatory requirements if the construe this research as collection of data to be shared with the regulator. To overcome these potential limitations, this study established contacts and use an introductory letter give confidence to the respondents. The respondents were also given the option of not indicating their name.

1.8. Outline of the thesis

The dissertation is organized into five chapters. The second chapter consists of a review of relevant literature to the research problem. The third chapter focuses on the research design covering data collection, sampling and analytical tools. Discussion about the implementation of the data collection instruments, the conduct of factor analysis to reduce the number of explanatory variables in the logistic regression analysis, and the different tests included in the study are provided. Descriptive statistics from the survey on Kenyan occupational pension schemes along with the empirical results of the analyses are presented in the fourth chapter. The last chapter provides a summary and the conclusions of the study as well as some suggestions for further research.

1.9. Definition of terms

Pension Scheme: According to the Retirement Benefits Act a pension plan or a pension scheme or pension fund also known as the retirement benefits scheme, is defined as a scheme or arrangement under which persons are entitled to members or eligible persons are entitled to receive payments upon retirement, death or termination of service (KRBA, 2010).

Risk: Lam (2011) defines risk as multiple perceptions in daily business operations. Risk is defined as the probability of an undesirable outcome, there being five types of such outcomes, namely poor system quality, cost overruns, missed deadlines, user dissatisfaction and discontinuation of the project (Besson, 1999).

Operational risk: According to Basel Committee on Bank Supervision (BCBS) report operational risk is the chance of loss resulting from inadequate or failed internal processes, people or systems or from external events (BCBS, 2011). Operational risk in the context of

pensions is more related to internal problems, such as employee fraud, leadership, segregation of duties, information risk and product flaws (Stewart, 2010).

Risk Management: It is the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustained benefit within each activity and across the portfolio of all activities. Li and Liu (2002) define strategic risk management as the uncertainty of loss of a whole organization and the loss may be profit or non-profit.

Strategic Risk Management: Strategic Risk Management is a process for identifying, assessing and managing risks and uncertainties, affected by internal and external events or scenarios, that could inhibit an organization's ability to achieve its strategy and strategic objectives with the ultimate goal of creating and protecting shareholder and stakeholder value (Li & Liu, 2002)

Adoption: Adoption is seen as the first or minimal level of behavioral utilization (Rogers, 2003). Adoption of risk management has been defined by Stewart (2010) as the use of risk management options for the betterment of an organization.

Occupational pension schemes: An arrangement (other than accident or permanent health insurance) organized by an employer (or on behalf of a group of employers) to provide benefits for employees on their retirement and for their dependent's on their death (Stewart, 2010). Occupational pension schemes are trust based form of work place pension schemes that are organized or sponsored by the companies or organizations for which people work (Blake, 2003).

Defined Benefits Scheme: A pension in which the rules of the scheme specify the rate of benefits to be paid (Stewart, 2010).

Defined Contribution Scheme: A pension scheme in which the benefits will be dependent on contributions and growth of the fund after allowing for the fund managers costs. It is also known as a money purchase pension (KRBA, 2011).

Active Member: Active members are current employees who are building up an entitlement to a pension from an occupational pension scheme (Thomas, Pettigrew, Candy & Hulusi, 2000)

Enterprise Risk Management (ERM): ERM is as a process, affected by management and other personnel as strategy in 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, 2010).

Variable: A variable has been defined as any entity that can take different values whether quantitative or qualitative (Trochim, 2002). A variable takes specific values called attributes, example gender variable has two attributes; male and female. A variable analysis on agreement for example may take four attributes; strongly agree, Agree, Disagree and Strongly Disagrees in related research (Trochim, 2002).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to set the relevant theoretical frame and empirical literature review for the study empirical work. This chapter is organized as follows; it covers the theoretical literature and empirical literature review on the adoption of risk management by pension's schemes. It also examines the relationship between the dependent variable and independent variables which are developed into a conceptual framework. The final section covers identification knowledge gaps and areas recommended for further study.

A systematic review of past literature is a critical process of any academic research (Webstar & Watson, 2002). According to Hart (2010), literature review is an objective, thorough summaries and critical analysis of available relevant research and non-research information on the field being studied. Gall, Borg and Gall (2008) argue that the literature review is important in delimiting the research problem, seeking new lines of inquiry, avoiding fruitless approaches, gaining methodological insights, identifying recommendations for further research and seeking support for grounded theory. Randolph (2009) argues that writing a literature review provides a framework for relating new findings to previous findings. Literature on the relationship between variables in this study will be discussed in two broad categories namely; theoretical review and empirical study.

2.2 Theoretical framework

This section offers the theoretical foundation of the study with an aim of determining the existing theories that could explain the drivers of adopting risk management strategies by pension schemes. Blumberg, Cooper and Schindler (2011) defines a theory as a set of

interrelated concepts, definitions, prepositions that have been put forth to explain or predict a scenario. Bull (2009) notes that a theory is a set of constructs, prepositions and definitions of an organized view of phenomena by pointing the relationships among variables with purpose of explaining the phenomena. A theory is a scheme of the relations subsisting between the parts of a systematic whole with summary of hypothesis or group of hypotheses that has been supported with repeated testing and is valid as long as there is no evidence to dispute it (Helmenstine, 2012). The main essence of theory is to provide an explanation to both an observed phenomena and a tentative reality (Kerlinger & Lee, 2000).

Theoretical literature review is a concrete examination of the amount of theory that has accumulated in regard to an issue, concept, or phenomena and is necessary in order to help establish what theories already exist, the relationships between them, to what degree the existing theories have been investigated, and to develop new hypotheses to be tested (Kennedy, 2007). Theoretical literature has been defined as a lens that provides a researcher a view the world (Blumberg, Cooper & Schindler, 2011).

This study hangers its variables on six theories namely: (i) Agency Theory which is linked with the Board of Trustees composition and the administration structure of a pension scheme ii) Stakeholders Theory and the cost benefits theory together used to explain the regulatory requirements (iii) Portfolio theory as it relates to pension schemes assets portfolio, iv) Contingency theory and linkage on pension scheme size, (v) Corporate risk management theory as it relates to pension schemes adoption of risks.

2.2.1 Board of Trustees Composition

Agency Theory

According to Brown Governance Report (BG) the agency theory was formulated in by Adam Smith in the 1700's, categorizing the various groups into Principals (owners) are people with a knack for accumulating capital, while Agents (management) are people with a surplus of ideas to effectively use that capital (BG, 2004). The agency theory problem is that, agents often have ideas to use capital that lies outside the intent (purpose) of the principals and governance exists to address this agency problem (BG, 2004). Eisenhardt (2009) argued that agency theory is directed at the agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work. Eisenhardt (2009) suggests that agency theory is concerned with resolving two risks that can occur in agency relationships the first is the agency problem that arises when the desires or goals of the principal and agent conflict and the difficulty for the principal to verify what the agent is actually doing, the second is the problem of risk sharing that arises when the principal and agent have different attitudes towards risk.

The agency theory linkages can be depicted showing relationships between the Principals, Governors and Agents whereby; Governor's act as an intermediary (boards in corporations), voice of the agents to the principals and as the principal's representative (steward, trustee, fiduciary) with the agents ensuring capital is directed to the right purpose and the governors also act as the, articulating their ideas for uses of capital and making an accounting of the use of capital back to the principals (BG, 2004). Principals select and put in place the governors (board of directors, trustees) and also select and put in place the auditors (external, independent body that tests and reports on the integrity of financial reporting and controls). The governors (intermediary entity or board) therefore have four core responsibilities, which

comprise leadership, Stewardship, Monitoring and reporting. These relationships are as shown in Figure 2.1.

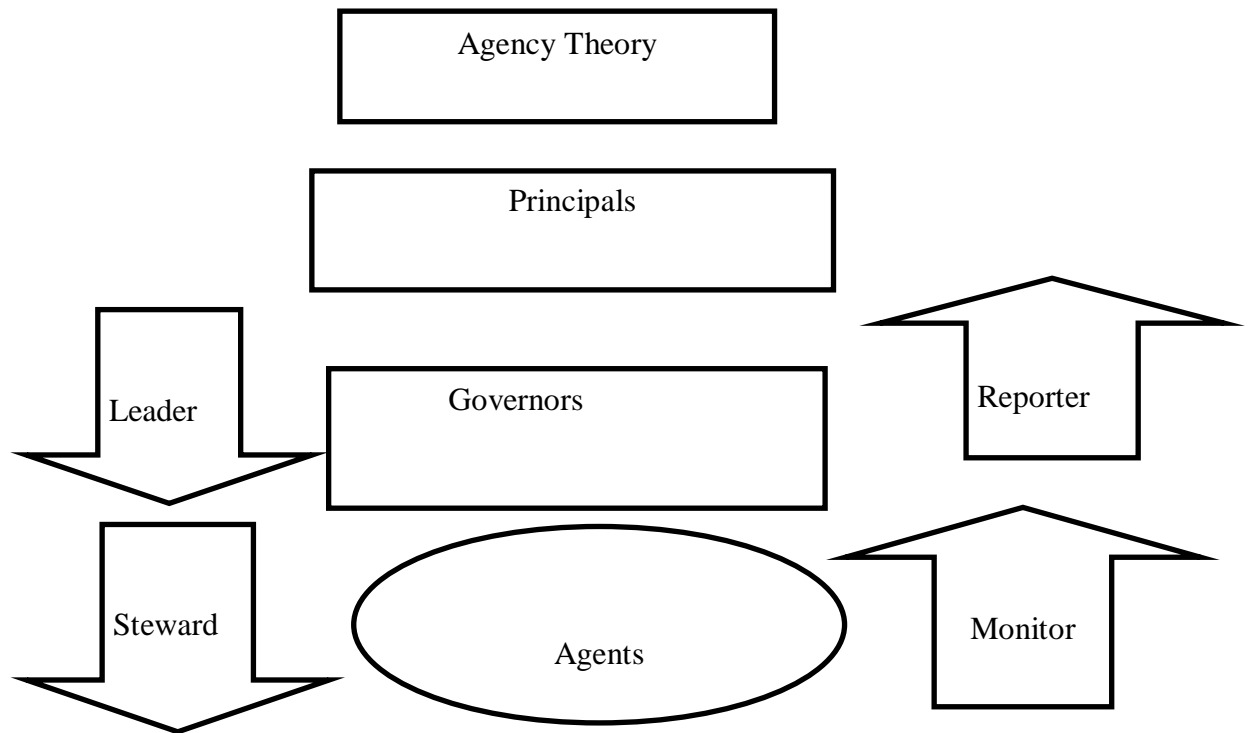


Figure 2.1: Agency Theory Model
Source: Brown Governance (2004)

In any real-world principal-agent relationship will involve some combination of internal and external control for an employee working under a piece-rate compensation scheme, the external incentives are largely sufficient to guarantee compliance with the principal's aims, but in a fiduciary relations external incentives tend to be extremely weak, and so principals depend very heavily upon moral constraint on the part of the agent to secure compliance (Heath & Norman, 2004).

Models on the role of Trustees in Managing Risk

According to the International Organization for Standardization (ISO), the Board plays a significant role in risk management framework the component of the ISO 31000

framework is mandate and commitment by the Board and this is followed by design of framework, implement risk management, monitor and review framework (Leitch, 2010). A framework model developed by Leitch (2010) is as shown in Figure 2.2

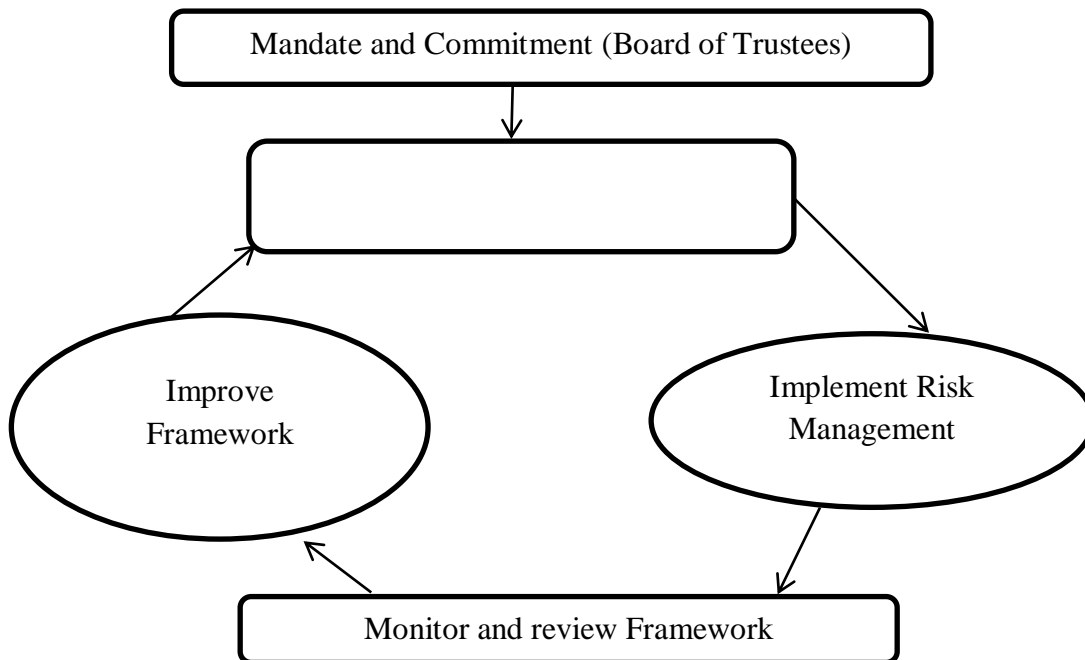


Figure 2.2: Framework for Managing Risk

Source: Leitch, (2010).

Relevance to the Research Problem

Agency theory has been used to analyze risk management by Hess & Impavido, 2003; Keasey, Short, & Wright 2005 who pointed out the trustees mix in terms of qualification and representation positively affects the implementation of risk policies. The trust form of pension funds in Kenya implies that the members of a scheme can be associated with the shareholders of a company and the controllers of an occupational pension fund, are the trustees. The sponsor also has control by exercising significant control over the pension trust

by retaining powers to amend the trust deed and replace trustees; control is therefore jointly exercised by the trustees and the employer; taken together they can be compared to the management of a company (Nocker, 2000)

The operational structures of pension schemes are akin to agency theory relationship, the members of a pension's scheme make periodic contributions to a pool where the funds are owned in trust by a board of trustees (KRBA, 2011). The Trustees in turn delegates the operational of the pension's schemes to Fund Managers, Administrators and Custodians. In line with the agency theory the Board of Trustees are the Governors while the Fund Managers, Administrators and Custodian are the Agents and the members are the principals. Pension schemes stakeholders are the government, Trustees, Pension fund. The regulations of the Kenya Retirement Benefits Act provides trustees discretion in decision making which is expected to be on best interest of members, this indicates the problem in principal-agent relationship in that trustees may make decision that favours their interests.

Clark and Urwin (2007) notes that pension scheme members may not have adequate knowledge and understanding to query the actions of the trustees thus opening up a chance for agency risk. The agency theory and its relevance to pension's schemes risk management thus points at the Board of trustees and the administrator as the key players in occupational pension schemes provision. The foregoing instigated the questions, what is the influence of the Board of Trustees composition on the adoption of risk management strategies? The hypothesis that was the subject of investigation, measure and test in this study was as follows.

***Hypothesis:** The board of trustee's composition does not influences the likelihood of adoption of risk management strategies by pension schemes*

2.2.2 Pension Scheme size

Organizational contingency theory

The contingency theory and approach to organizational structure based on size was pioneered by Burns and Stalker (1961) who distinguished between the mechanistic structure in which organizational roles were tightly defined by superiors who had the monopoly of organizational knowledge, and the organization structure in which organizational roles were loosely defined by mutual discussion between with employees. According to Galbraith (1973), contingency theory has two basic underlying assumptions: First there is no one best way to organize and secondly any way of organizing is not equally effective. Ayman (2002), advanced a theory of structural differentiation by asserting that as an organization grows in size so it structures itself more elaborately into increasingly numerous sub-units, such as more divisions, more sections per division and more levels in the hierarchy and so on. He also argued that organizational growth leads to greater economies of scale with the proportion of employees who are managers or support staff declining.

According to Fisher (1995) the assumption underlying contingency theory is that no single type of organizational size and structure is equally applicable to all organizations rather, organizational effectiveness is dependent on a fit or match between the type of technology, environmental volatility, the size of the organization, the features of the organizational structure and its information system. These studies postulated that organizational structure was contingent on contextual factors such as technology, dimensions of task environment and organizational size. The size of an organization could explain many characteristics of its structure (Fisher, 1995).

Pension funds are structured in its establishment and operations, with the regulator of the scheme advising government on the developments of the industry and ensuring that the

regulations and legal acts set are adhered to. The Trustees are responsible for pension schemes and delegate the day to day activities to scheme's Administrator or principal officer. The structure and the leadership approach in specific pension schemes are contingent upon the size of the scheme and this may impact on the scheme performance. This instigated the question does the size of a pensions funds influence the Likelihood of adoption of risk management strategies in Kenya? The second hypothesis that was a subject of investigation, measure and test was as follows.

Hypothesis: The size of pension scheme does not influences the Likelihood adoption of risk management strategies by pension schemes

2.2.3 Regulatory framework

Stakeholders theory

Freeman (1984) defined stakeholders as any group or individuals who can be affected by the achievement of objectives or actions of a firm and suggested that firms should identify their direct and indirect persons or groups that are affected. Freeman modeled the concept of stakeholders as those impacting on the firm and who the firm affects. The focus of stakeholder theory is articulated in two core questions; first, it asks, what is the purpose of the firm? Second, stakeholder theory asks, what responsibility does management have to stakeholders?.

Brenner and Cochran (1991) study points out that stakeholder theory of the firm has two purposes: to describe how organizations operate and to help predict organizational behavior. They contrasted this theory, with other theories of the firm, but they did not ask whether the various theories cited have comparable purposes. Stakeholder theory has been used to describe the nature of the firm (Brenner & Cochran, 1991), to describe the way managers

think about managing (Brenner & Molander, 1977), to describe how board members think about the interests of corporate constituencies and to describe how some corporations are actually managed (Clarkson, 1991; Halal, 1990; Kreiner and Bhambri, 1991). Donaldson and Preston (1995) developed a stakeholder model with the firm lying in the hub as shown in Figure 2.3, the arrows between the firm and its stakeholder constituents run in both directions and all stakeholder relationships are depicted in the same size and shape and are equidistant from the black box of the firm in the center.

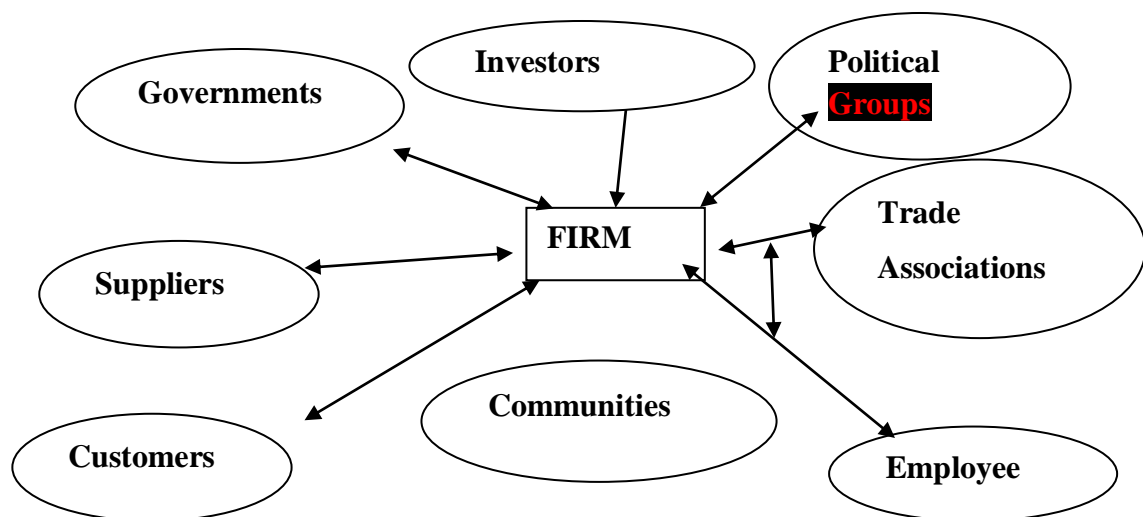


Figure 2.3: The Stakeholder's Model

Source: Donaldson and Preston, 1995

Fassin (2008) calls for a revision of the Freeman's Model by putting senior management at the Centre of the hub of the model and not the firm arguing that management is the driver of decision making not the firm. Fassin (2008) further proposes that the Board of Directors should be depicted as a stakeholder. Rowley (1997) proposes a stakeholders network model arguing that a stakeholder of one firm can also be a stakeholder of the other firms which has

their specific network of stakeholders giving rise to a web network model as shown in Figure 2.3.

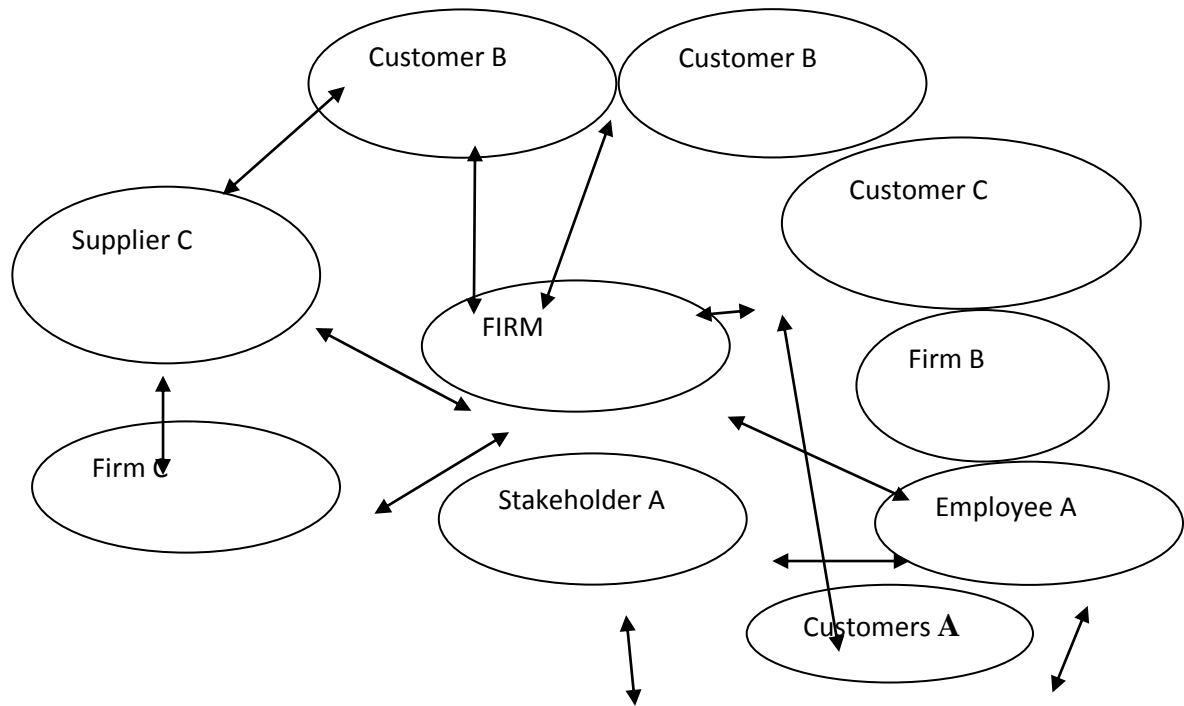


Figure 2.4: The network model of stakeholder theory

Source: Rowley (1997)

According to Brenner and Cochran (1991) that stakeholder theory of the firm has two purposes: to describe how organizations operate and to help predict organizational behavior. They contrasted this theory, with other theories of the firm, but they did not ask whether the various theories cited have comparable purposes.

Relevance to the Research problem

From the stakeholder theory, it is recognized that an entities impact other entities and in turn impacts on other entities in the environment directly or indirectly. The major role of stakeholders such as employers, administrators, fund managers, custodian and government together with its regulatory arms in pension funds risk management cannot be understated.

Therefore it can be argued that regulatory environment is necessary to bring order and sanity among the various stakeholders.

Cost benefit theory of regulation

The Cost Benefit Analysis (CBA) theoretical framework was established in 1958 with the publication of work by economists who methodologically used neoclassical welfare economics in relation to CBA (Mishan & Quah, 2007). Nocker (2000) argues that regulation can be seen as a form of taxation. He refers to a common form of regulation which requires a regulated company to provide certain products or services to some customers at below cost, to be paid for by higher than market prices elsewhere. Nocker's view of regulation could be applied to any regulatory policy which creates winners and losers.

In the pension's schemes regulations and risk management, the CBA theory was applied by Bhojraj and Sengupta (2010), in their study of the pension's miss-selling scandal in the UK between 1988 and 1994. The scandal was that a new regulatory regime of consumer protection did not prevent retail pension providers from persuading individuals to opt out of their occupation pension schemes into inferior personal pension schemes. These authors to some extent anticipated the problems with the UK regime of consumer protection in financial services. The lessons of regulatory failure must therefore be used to address not just questions about the implementation of a regime, or indeed just about its design, but also about whether or not regulation is a sensible policy option for competitive market and risk management (Bhojraj & Sengupta, 2010). The stakeholder theory and the CBA theory posits that there is need to address the question of the influence of regulatory environment on the adoption of risk management. The third research hypothesis that was investigated, measured and tested in this study is as follows:

Hypothesis: Regulatory framework does not influences the Likelihood of adopting risk management strategies by pension schemes

2.2.4 Portfolio structure

Portfolio theory

Markowitz (1952) is referred as the father of modern portfolio theory, which he formulated the as a choice of the mean and variance of a portfolio of assets arising from a mix of various assets leads to a reduction of risks and thus the more the number of investment options the easier it is to adopt risk management strategies. The fundamental theorem of mean variance portfolio theory is based on holding constant variance, maximizes expected return, and holding constant expected return minimizes variance. These two principles led to the formulation of an efficient frontier from which the investor could choose his or her preferred portfolio, depending on individual risk return preferences (Bodie, Markus and Kane 2009).

Markowitz's theory is referred as Modern Portfolio Theory, a theory of investment which attempts to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets (Omisore, Yusuf, & Christopher, 2012). Most companies seek higher returns from asset mix that includes equities and thus assume some risks, but through asset allocation across various investment classes the risks are minimized (Pozen, 2004). Pozen further argues that in defined benefits pension schemes portfolio arrangements by inexperienced trustees may hamper the success of pension schemes (Pozen, 2004). The portfolio model and minimization of risk has been mathematically modeled as

$$\textit{Total Risk} = \textit{Diversifiable Risk} + \textit{Market Risk (un-diversifiable risks)}.$$

In the 1970's portfolio theories were introduced in the field of strategic management and marketing and different portfolio models were developed as strategic tools to address the complex nature of enterprises which were cutting across nations with multiple products (Wind & Mahajan, 1981).

Pension funds should find a balance between continuously adapting their policy based on short term developments and sticking too long to their long term policy; considering risk component, Investment component, Governance component and monitoring component (Krammer, 2007). Strategic risk management model for pension schemes portfolio investments developed by Ortec finance limited links the risk components. Strategic risk management model developed by Krammer (2007) is as shown in figure 2.5.

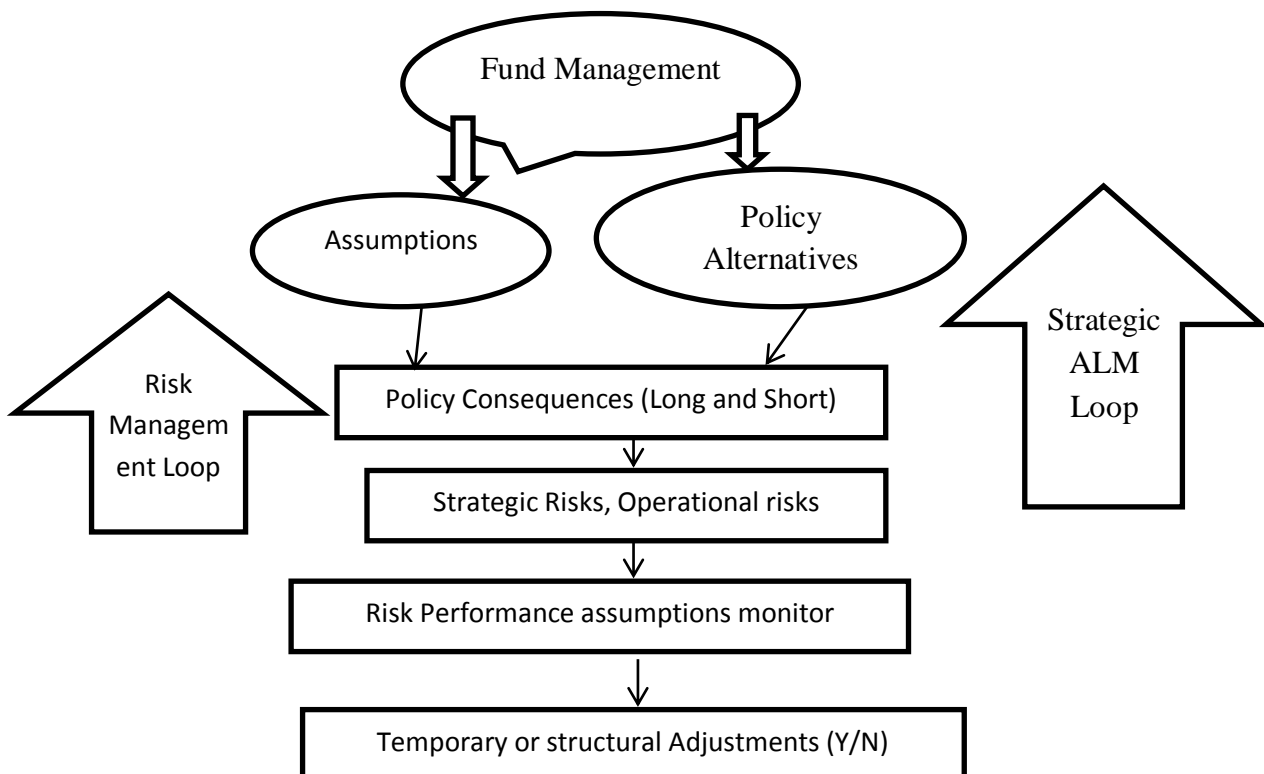


Figure 2.5: Model of Strategic Risk Management
Source: Krammer (2007).

Relevance to the research problem

Risk management in a pension scheme set up whereby the objective was to offer a decent replacement income presupposes that investment decision makers should consider return on investment which should not only cover inflation but the level of risk exposure is minimized. The portfolio theory provides a good basis for evaluating the selection and allocation of assets so that it can minimize risks. Portfolio construction of the scheme assets can be successful only if the risk level of assets is considered. This theoretical review instigated the research hypothesis that was investigated and tested in this study as follows:

***Hypothesis:** Portfolio structure does not influence the likelihood of adopting risk management strategies by pension schemes*

2.2.5 Pensions administration structure

Systems theory

A system has been described as a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process (Krammer, 2007). Systems theory approaches a system as a whole while appreciating the mutual interdependency of the parts and thus fits to administration and management (Krammer, 2007). In regard to applications in studies of perception, systems theory can model complex intrapersonal, interpersonal, intergroup, and human/nature interactions without reducing perceptual phenomena to the level of individual stimuli (Weber, 2007).

Rosenzweig, Kast and Johnson (2008) notes that a business organization is a man-made system which has a dynamic interplay with its environment, customers, competitors, labor organizations, suppliers, government, and many other agencies. He argues that business

organization is a system of interrelated parts working in conjunction with each other in order to accomplish a number of goals, both those of the organization and those of individual participants.

According to Schaefer (1998), Dunlop is credited as the pioneer of systems theory in application of social science based on the Dunlop's model of input output. The input output model developed by Dunlop is as shown in Figure 2.4 below:

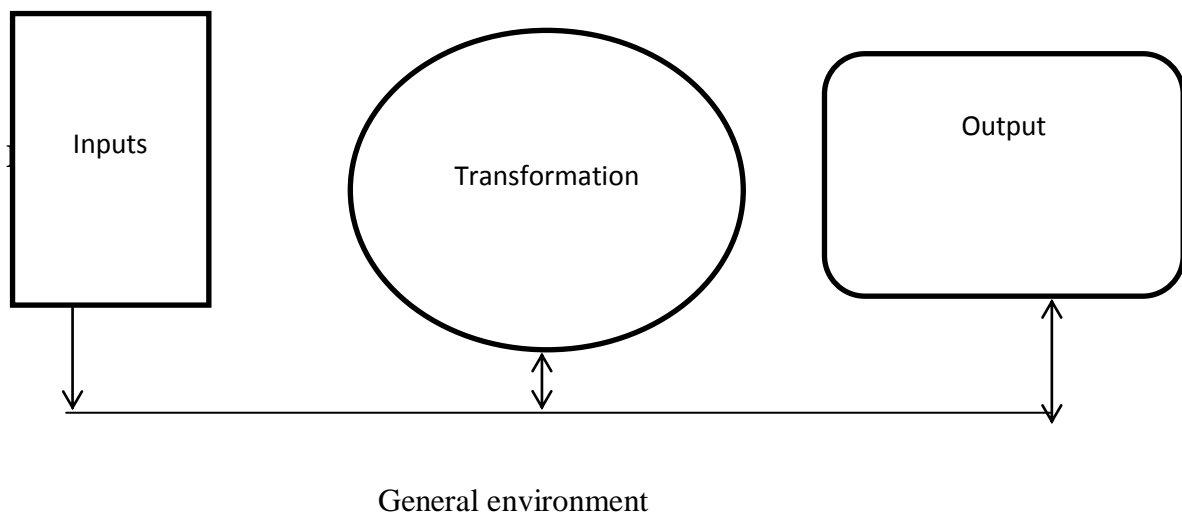


Figure 2.6: Dunlops Systems Model

Source: Schaefer (1998).

Systems theory has been used in analysis of risk management by Stewart (2010) taking the governance perspective of pension schemes in OECD countries. Given the structure of pension schemes operations; having a regulator, trustees, and service providers, sponsor and members, this theory fits with the analysis of adoption of risk management strategies by the pension schemes.

***Hypothesis:** The structure of pension's administration does not influences the likelihood of adopting risk management strategies by pension schemes in Kenya*

2.2.6 Risk Management

Corporate Risk Management Theory

There are two dominant views on adoption one by Tornatzky and Fleischer (1990) which holds that Adoption can be seen as having or not having an innovation and another view that it can be seen as using the innovation versus not having it (Rogers, 1995). Adoption is according to Rogers, "... a decision to make full use of an innovation as the best course of action available and rejection is a decision not to adopt an innovation." (Rogers, 1995). According to this view the line between adoption and use of the innovation is thin or non-existent. Rogers argues, that the adoption process is the process through which a decision-making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and finally to confirmation of this decision. In this course of events the adoption process is considered to be merely a mental exercise until implementation takes place. In this dissertation the core understanding of the term adoption is "having versus not having" (Tornatzky and Fleischer, 1990) rather than "not having versus using" (Rogers, 1995).

Theorists have constructed two classes of explanations for managers' choices of risk management activities on behalf of their firms; One class of explanations focuses on risk management as a means to maximize shareholder value, and the second focuses on risk management as a means to maximize managers' private utility (Tufano, 1996). Ross (2005), notes that the market perfection as a rationale for risk management makes risk management irrelevant because shareholders can replicate at their level any strategy adopted by the firm.

Smith and Stulz, (1985) claims that risk management can reduce either the overinvestment or underinvestment costs resulting from the non observability of managerial actions. The effectiveness of such policy is, in general, inversely related to the volatility of the cash flows

generated by the firm. This negative relation in Smith and Stulz (1985) implies that firms will manage risk to decrease cash flow volatility because it reduces one of the costs related to managerial discretion in presence of information asymmetry for shareholders. Nance, Smith and Smithson (1993) notes that market imperfections such as taxes, financial distress costs, and investment opportunities are advanced in the literature to explain why firms manage risks.

According to the international Organization of Standardization (ISO) the risk management process has been presented as a list of co-ordinated activities consisting of; recognition of risks, ranking of risks, responding to risks, tolerate, treat, transfer, terminate, resourcing controls, reaction planning, reporting and monitoring risk performance reviewing the risk management framework (ISO, 2009). The risk Management Process has been modeled as shown in Figure 2.7.

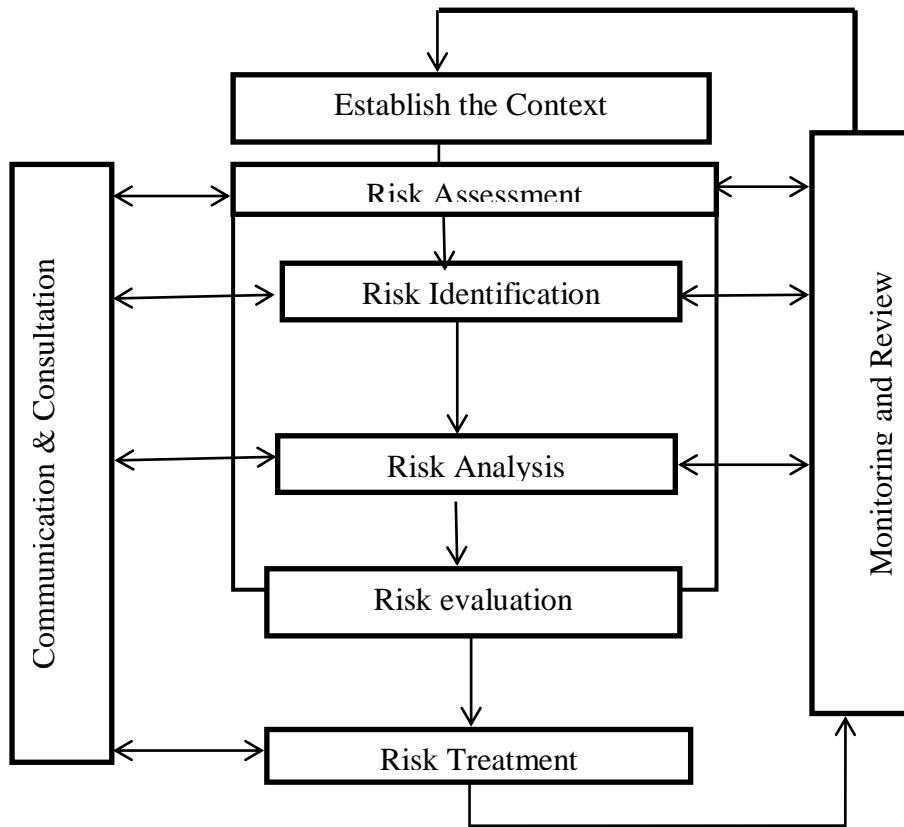


Figure 2.7: Risk Management Process

Source: ISO – 3100 (2009)

According to Krammer (2007) , an organization has a number of goals and objectives it can pursue, thus can ultimately decide on those that best meet stakeholder preferences for growth, return, safety, sustainability and its willingness to accept risk. The objectives, in turn, may be pursued using a number of alternative strategies as shown in Figure 2.8.

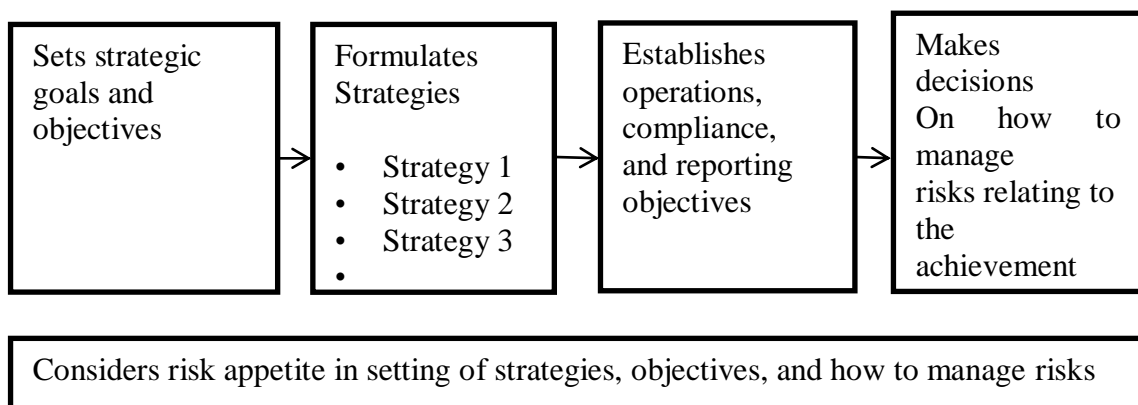


Figure 2.8: Interrelationship of strategy, management decisions, and risk appetite

Relevance to the Problem

In a seminal paper on occupational pensions, Blinder (1983) found that with no uncertainty, no taxes, and perfect capital markets, pensions are perfect substitutes for cash wages. McCarthy (2005) generalizes this result and shows that in complete capital markets (which have uncertainty), the same result obtains. Governance and risk management challenges are often reported in the corporate sector. Pension funds are akin to the corporate firm; with the Board of trustees (governors) being at level of Board of Directors of a corporate entity while the members are equivalent to the shareholders.

2.3 Conceptual Framework

Ramey and Reichel (1997) define a conceptual framework as a collection of interrelated ideas and principles arising from enquiry of relevant literature and used to structure a graphical presentation showing systematic relations. Guba and Lincoln (1989) argue that conceptual frame is a diagrammatic tool of research used to clearly understand and communicate a field of study. Myers (2009), suggest that a conceptual framework explain graphically the general constructs of the variables to be studied and the relationships amongst them. From the reviewed literature in this study, the independent variables that were investigated on how they influence adoption of risk management strategies are; Board of Trustees Composition, Size of pensions scheme, Portfolio structure, regulatory requirements and pension's schemes Administration. This study conceptualized framework derived from theoretical review of variables is as shown in Figure 2.9 on page 36

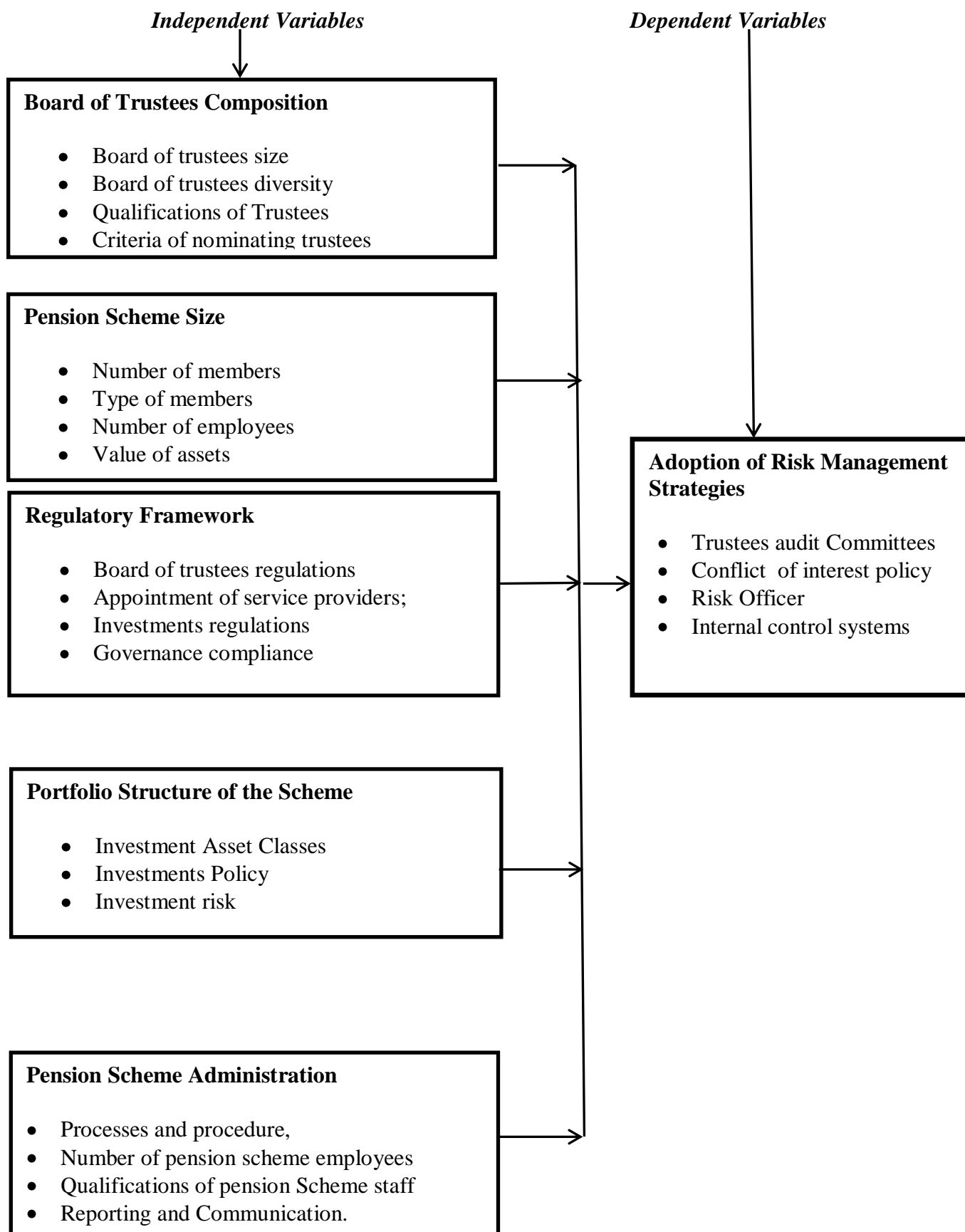


Figure 2.9: Conceptual Model

2.4 Critical review of literature

2.4.1 Board of trustees composition

Board composition as the concept of diversity relating to the varied board of trustees combination of attributes, characteristics and expertise contributed by individual board members in relation to board process and decision making (Walt & Ingley, 2008). Rose (2005) argues that there is no commonly agreed upon definition of what board composition covers. Board composition can be defined in many different ways, yet most common is the discussion of scheme outsider and scheme insider representation on board reflecting the issue of board independence (Hoyt, 2012). According to Law debenture report (LDR) how trustees manage risk is a cornerstone of good governance; it is about an attitude of mind and a way of thinking and acting (LDR, 2008). The most effective and sustainable approach to dealing with risk is one which is practical, which becomes integrated with routine activity and which is seen to result in useful and worthwhile improvements in the way a scheme is run (LDR, 2008).

The primary functions of the supervisory board are advising and controlling, or monitoring and thus the corporate governance framework should ensure the strategic guidance of a scheme to meet this and the trustee's accountability to the company and the shareholders (Stewart, 2010). The question of optimal board structure is in so far that it is able to fulfill its roles efficiently and effectively remains unanswered.

The Kenyan Retirement Benefits Act of 1997, provides that the duties of the trustees shall include: Administering the scheme in accordance with the provisions of the Retirement Benefits Act, and scheme rules; keeping all proper books and records of account in respect to income, expenditure, liabilities and assets of the scheme fund; computing and preparing statements of payments of benefits to members; liaising with the Authority, sponsors,

members, manager, custodian and any other professional engaged by the scheme; collecting, keeping and updating retirement benefits data of each member including maintenance of individual membership records and bank account details of the members for the purpose of payment of benefits; updating the sponsor at least quarterly during the financial year on all matter regarding the scheme (KRBA, 2011).

Board of Trustees Diversity

The OECD principles on corporate entities provides that at least half of the board's members need to be independent, which in essence means no close or personal ties to the company, and it should be of appropriate size in relation to the organization's complexity while ensuring a certain degree of diversity among the board members regarding their backgrounds, areas of expertise, and experience among many others (Stewart, 2010). Carver (2002) argues that a stakeholder's oriented approach uses boards of trustees in their stewardship role due to moral obligations as a justification for board diversity. Gregoric, Oxelheim, Randøy and Thomsen (2009) in their study of Nordic firms between 2001-2007 find that diversity along the measures of gender, qualification of trustees, nationality and age dispersion has a positive impact on firm performance and risk management strategies with respect to firm value return on assets, risk management and growth.

Britain's Cadbury Report (1992) calls on boards to take responsibility for the governance of their firms and should at least have three independent directors in the Board (Cardbury Report, 1992). Canada's Dey Report (CDR) recommends that boards need to explicitly assume responsibility for governance, including, leadership, stewardship, risk management and information (CDR, 1994). The US Sarbanes-Oxley (2007) Report by US exchanges (US-SOR) mandated board audit committees to constitute Boards to consist primarily independent (outside) directors (US-SOR, 2007).

Sponsor and Members' nominated Trustees: Sponsor's and member trustees ratio in a board of trustees are prescribed by the Kenyan Retirement Benefit Act (KRBA) provides that for a DB scheme, the number of member elected trustees should be at least one third of the total trustee (KRBA, 2011). For a defined contribution scheme the Act provides that 50% of trustees to be nominated by members. Members often elect from the active members (those in employments) or from the pensioners. The Sponsor's two-third trustee can be drawn from employees or independent appointed. Cocco and Volpin (2007) find that insider trustees (those that are also a part of the management of the company) tend to act in the interest of the plan sponsors, not necessarily in the interest of plan members. Kakabadse and Kakabadse (2005) argues that lay trustees display similar characteristics in as professional trustees and are capable of handling pension plan decisions.

Gordon and Roe (2004) see the embodiment of worker-elected representatives on a board as an important part of corporate governance. Bhagat and Black (2008) counter this argument through their finding that the ratio of outside directors on board is unrelated or even negatively correlated with firm value, measured by Tobin's q in their respective studies. Rosenstein and Wyatt (1997) as well as Klein (1998) argue that insiders can provide relevant inside information and demonstrate commitment and conclude that insider representation on board appears to increase firm value. Bhorjraj and Sengupta (2010) document those firms with strong outside directors (independent directors) lower firm risk. On the Board composition, evidence on the relation between board composition and risk management adoption are mixed. The importance of board independence is rooted in the separation of ownership and control (the agency issue), which arises due to dispersed ownership that lacks strength compared to the management of the firm (Hoyt, 2012). The presence of outside directors or trustees is directly linked to discrete tasks, including the hiring and firing of the Chief Executive Officer (Weisbach, 1988)

Gender Mix of the Board of trustees: Gender the Kenyan constitution 2010 (RoK, 2010) provides that each public office should have at least one-third of the members from either gender. Generally speaking, the presence of women in corporate board rooms remains relatively weak (Daily, 2009). The potential benefits of female board presence in relation to firm performance have been at the core of the debate and academic research and independent studies have yielded mixed results (Muhammad, 2011). Gordon and Roe (2004) offer insights on how employee representation affects firm decision making and financial performance. Their study is one of a few quantitative studies in this area. Rose (2007) concludes from his theoretical work the hypothesis that a higher degree of women represented in corporate boards impacts risk management and financial performance positively. His empirical work fails to find a significant link between female board representation and firm performance as measured by Tobin's q (Rose, 2005).

Age of Trustee: The age structure of the trustees has been found to have an influence on the performance and embracing of risk management with younger employee willing to take aggressive options and the older being conservative and diligent on risk management (Kostyuk & Koveraga, 2006).

Board of Trustees Size

Board of trustee's size refers to the number of board members that are governing a pension scheme in accordance with the trust of the scheme (Muhammad, 2011). On the size of Board of Trustees, Song and Cummins (2008) argues that larger boards could be less efficient and less effective due to coordination problems arising because of its size and that the smaller boards operate more efficiently. Evidence related to firm value, as measured by Tobin's q, demonstrate that smaller boards are associated with higher firm value and efficient risk

management, because smaller groups are more cohesive and hence can fulfill their monitoring role better (Song and Cummins, 2008).

Number of Trustees: The Kenyan Retirement Benefits Act of 1997 provides that a trustees Board should have a maximum of nine (9) trustees and a minimum of three trustees (KRBA, 2010). The ranges of six provide room for various sizes of trustee's numbers from one scheme to another. Hoyt and Liebenberg (2009) argue that larger firms are more likely to engage in risk management due to their relatively high complexity, the fact that they face a wider array of risks, and their financial ability to bear the administrative cost of risk management adoption. Pension Management Institute (PMI) developed a model of the effect of board of composition on risk management. The identified attributes of the board incorporated in the model are board structure as explained by board size, outside representation, committee structure, trustees' skills and board process as represented by effort, norms and Cohesiveness (PMI, 2010).

Qualifications of the trustees

In Kenya under the Retirement Benefits Act, there are no minimum qualifications for one to be a trustee. However, the Act was amended in the year 2010 to requirement pensions scheme to train and certify at least one member of the board on the Trustees training certification course offered by the Retirement Benefits Authority and the Association of Retirement Benefits Schemes (ARBS). It is thus uncommon to find trustees elected by members on the basis of union activism and not on knowledge of pension scheme governance (Kiragu, 2010).

The present study investigates the influence that the Board Composition has on adoption of risk management. From the reviewed literature, this study hypothesis is that that the Board of

trustee's composition of a pension scheme is positively linked to the adoption of risk management by pension schemes.

Board of trustees risk tolerance and appetite

According to the Committee of Sponsoring Organizations of the Treadway Commission (COSO), risk appetite is the amount of risk, on a broad level, an entity is willing to accept in pursuit of value; it reflects the entity's risk management philosophy, and in turn influences the entity's culture and operating style, guides resource allocation, assists the organization in aligning infrastructure necessary to effectively respond to and monitor risks (COSO, 2010).

Risk appetite is not developed in isolation from other factors. An organization should consider its capacity to take on extra risk in seeking its objectives. It should also consider its existing risk profile, not as a determinant of risk appetite but as an indication of the risks it currently addresses. An overview of the considerations affecting risk appetite is shown in

Figure 2.10

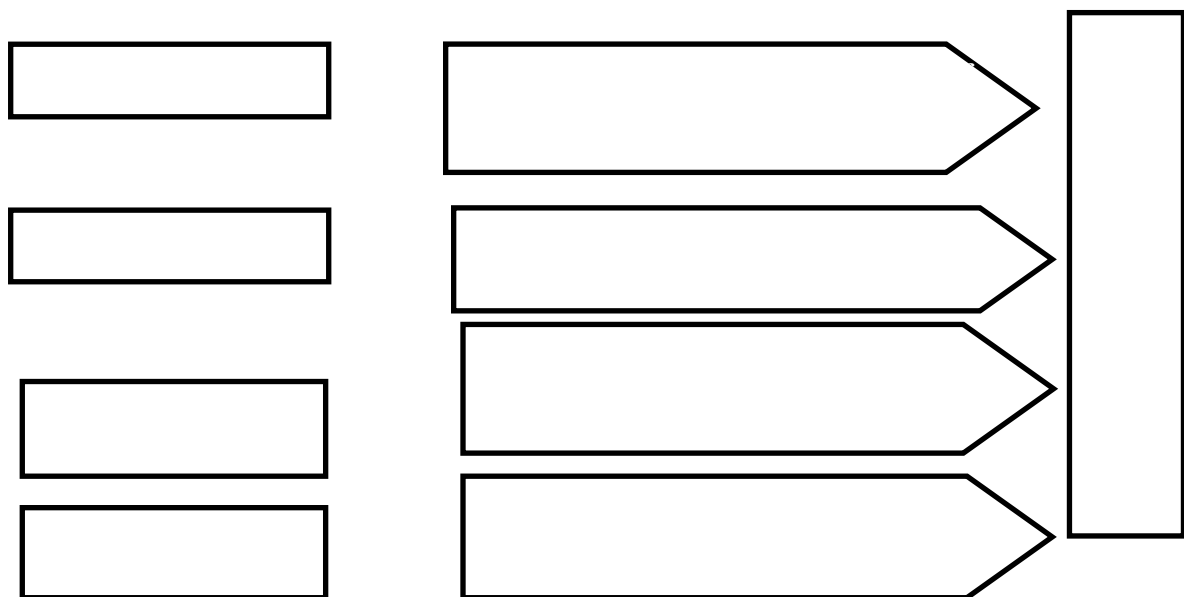


Figure 2.10: Risk appetite determination model

Source: Davis (2001)

2.4.2 Size of Pension Schemes

Value of Assets

Pension scheme size can be defined in terms of asset value, number of members and coverage (KRBA, 2010). A study by Ahire and Dreyfus, (2000), suggests that size of a pension scheme is positively related with higher process quality and risk management. This is in agreement with Schaefer (1998) study that concluded that managers of larger firms in terms of asset value exert higher levels of effort in managing risks, noting that incentive contracting is an important motivation for managers generating performance, therefore, it affects a firm's processes as a whole. A study by Hoyt (2012) found out that larger firm are more likely to implement integrated risk management concepts than smaller firms. The Kenyan Retirement Benefits Authority categorizes schemes as per value of assets for the purpose of levy payment based on size of Scheme Fund as indicated in latest Audited Accounts (Kenya Shillings) as follows: Up to 500 million, More than 500 million but not exceeding 1,000 million, More than 1,000 million but not exceeding 5,000 and More than 5,000 million (KRBA, 2012).

Number of members

Different studies (Bhagat & Black, 2008; Bhojraj & Sengupta, 2010) distinguish between large and small pension funds by using the number of members as a measure of size. The level of operation activities in a pension scheme is dependent on the number of member of the scheme which implies that the operation risk is higher. Towers Pensions Survey (TW) classifies sizes of schemes in term of number of member's large scheme being those with over 2000 members, Medium Size between 1000 -1999 members and small schemes below 1000 members (TW, 2011).

Members Type

According to the International Organization of Pensions Supervisors (IOPs) pension scheme members can be retirees, in service members or beneficiaries each having different levels of risk appetite. The average age of each of the category also plays a significant role in administration and investments of pension scheme (Stewart, 2010). This study investigates the influence that the pension scheme size has on adoption of risk management. From the reviewed literature, this study hypothesis is that that the size of pension schemes is positively associated with the adoption of risk management by pension schemes.

2.4.3 Regulatory Framework

Regulatory risk management systems can be broken down into four broad categories management Oversight and Culture, Strategy and Risk Assessment, Control Systems and Information, Reporting and Communication (Stewart, 2010). Management and oversight are regulations regarding to Board of trustees while strategy and risk assessment encompasses investment regulations, and appointment of advisors. The Regulatory body in Kenya, the Retirement Benefits Authority, was established in 1997 after the enactment of the Retirement Benefits Act Cap 197 of 1997 (KRBA, 2010).

Pension funds are subject to various regulations, although the structure of such regulations differs across countries (Paganch & Warr; 2007). Hu (2005) argues in favour of pension fund regulations in order to reduce risk, noting that Pension funds are a quite different kind of assets which are collected and managed for the purpose of availing retirement provisions for millions of retirees thus explicitly or implicitly, governments always stand behind the overall social security systems. Market failure is another argument explaining why national authorities seek to regulate pension fund industry (Davis 2001). Market failure is an

economic phenomenon where the free market mechanism cannot solve the economic problems in an efficient matter, thereby justifying the step-in of the government (Hu, 2005).

Some industries are more regulated than the others, therefore firms operating in intensive-regulated industries are more likely to adopt risk management and they have been at the forefront of specific risk management structure such as ERM implementation, examples of these regulated industries are financial firms and energy firms (Pagach & Warr, 2007). Various rules and regulation in different countries such as Sarbanes Oxley Act and Australia or New Zealand 4,360 standard have acted as an external pressure for firms to adopt risk management (Beasley, Clune & Hermanson, 2008). Additionally, Liebenberg and Hoyt (2007) found out that firms based in United Kingdom and Canada are more likely to adopt risk management programs than firms headquartered in the US.

Investment Regulations and Risk Management

Pension fund investment regulations forms are basically specifying holding limits by asset class, concentration of ownership, issuer, and security which guides implementation level of risk management (Srinivas, Whitehouse & Yermo, 2000). Although they have different restriction setting criteria, they all share one purpose, which is risk minimization given a certain level of return (Hu, 2005). Gallo (2009) notes that one of the main objectives of Risk Based Supervision (RBS) is crucial for aligning investment regulations in the banking, insurance and pensions so as ensure that institutions adopt sound risk management procedures and hold appropriate levels of capital. Pension supervisors face challenges that are in many aspects similar to those faced by banks and insurance supervisors.

In Australia, the regulations require trustees to submit a formal business plan including risk management strategy to Australian Pension Regulatory Authority (APRA), which must

specifically address all the risks faced by the trustees and the fund, including: governance-related risk (definition, delegation and segregation of responsibilities, outsourcing, fraud); operational risk (information systems and records, strategy); investment-related risk (market, credit or liquidity); and risk mitigation through insurance (APRA, 2011).

Board of Trustees Regulations

The size of the board of trustees is recognized in the regulations in line with the challenges of large pension boards such as: cost of a large Board, large board takes long to make a decision (Hess & Impavido, 2003). Small boards can make better and quicker decisions since the effectiveness of the board depends on the working methods and voting procedures (Yermo & Severinson, 2010). The regulation on the maximum board members in Singapore is seven while in New Zealand twenty and Morocco are nine respectively thirty seven in India, eleven in Japan, twenty in Korea and France and eight in the Philippines (Impavido, 2003). The regulations as per the Retirement Benefits Act in Kenya provides for a maximum of nine (9) trustees for a pension scheme, whereby for a DB scheme member nominated trustees should be at least a third while for DC scheme member to sponsor trustees should be on a 50:50 basis (KRBA, 2011).

Appointment of Service Provider's Regulations:

Trustees of a pension scheme are mandated to; collection of contributions, administer member accounts, investment management, retirement products provision and custody of the pension assets. The regulatory provision in many countries allows for outsourcing to external service providers (Beasley, Clune, & Hermanson, 2008).

According to the Kenyan Retirement Benefits Act, the service providers of a pension's scheme must be approved registered with the Retirement benefits Authority, regulatory

provisions under the Retirement Benefits Act, 1997 has been developed for fund managers, administrators and custodians to pension funds (KRBA, 2012). By regulating the service providers, the regulator aims at ensuring that services offered members fairly and in accordance with law.

2.4.4 Portfolio Structure of the Scheme

Portfolio structure of a scheme refers to the mix of investments that a pension scheme puts in place as a way of diversification, Pagach and Warr (2007). Portfolio diversification increases the complexity of a firm and, hence, more diversified firms should be more likely to benefit from risk management adoption (Song & Cummins 2008). The extant literature has suggested that diversification holds special potential value as a risk management mechanism (Song & Cummins 2008; Elango, & Pope, 2008).

Portfolio structure drives the impact of losses that are either location- or business-specific yet, as a cost, this strategy augments the level of risk complexity that the company faces (Wagner 2010). According to Kenya Financial Stability Report (KFSR) the Kenyan pension industry the portfolio diversification as at 31st December 2011 was; government securities (Treasury bills and bonds), quoted securities and immovable property accounted for the largest share at Ksh.146 billion (34 percent), Ksh.93 billion (21 percent), and Ksh.88 billion (20 percent), respectively, while the assets in the form of guaranteed funds' investments amounted to Kenya shillings 48 billion (CBK, 2011).

Interest Bearing Assets

Interest Bearing assets are fixed income investments which the investor earns periodic interest and the principal is paid back at maturity. Ross (2005) defines interest bearing assets as predetermined earnings that can be paid to an investor. Interest bearing assets can further

be classified as: Fixed Deposits, Corporate Bonds, Government Bonds, Treasury Bills and Commercial Paper.

Equity

Equity is an investor's claim to assets of a company (Ross, 2005). There are two types of equity investments namely Quoted equity and unquoted equity. Quoted equities are shares that are traded at a stock exchange and offers liquidity to the investor. Unquoted equity refers to the fact that the holder of the shares cannot trade the shares in a stock exchange. Unlike interest bearing assets, Equity provides a fixed source of finance to the company.

Property

Another class of investments to pension schemes is immovable assets represented by property, which includes land and buildings (Greenfield, 1997). Property provides a good option for pension schemes' asset diversification since its performance is often inversely related with equity (Suwetwattanakul, Tariki & Georges, 2010). The gains from property are in the form of rental income and capital appreciation.

Offshore

Offshore investment refers to investment of a pension scheme assets in another country. The investment could be in form of an equity fund or fixed interest asset. Offshore investments are susceptible to foreign exchange risks but are not affected by the country of origin sovereign risks directly (Gordon & Roe, 2004). This study investigates the influence that the portfolio structure has on adoption of risk management. From the reviewed literature, this study hypothesis is that that the portfolio structure of a pension schemes is positively associated with the adoption of risk management by pension schemes.

2.4.5 Pension Scheme Administration

A pension scheme administration is a function of a scheme administrator. Administrator of a scheme is defined by the United Kingdom Pensions Regulator (UK Regulator) a natural person or corporate entity appointed by the trustees of a pensions scheme to; ensure employer and employee contributions are collected, ensure member records are kept up to date so as to protect members' interests in accordance with the trust deed and rules, Ensure pensions are computed accurately and paid correctly, employ advisors to ensure to assist in fulfilling trustee duties people, attend trustees meetings and advise on scheme operation (UK Regulator, 2011). An administrator plays a fundamental role in a scheme in risk management since they offer members records and contributions to other service providers to a scheme. Getting the administration correct is central to any pension arrangement otherwise member benefits will be placed at risk where records or data have not been properly maintained (Yermo, 2000), According to Canadian Pension Supervisory Authorities (CAPSA), pension scheme administrator should provide for the establishment of an internal control framework, commensurate with the plan's circumstances, that addresses the pension plan's risks (CAPSA, 2012). Responsibility and accountability for administration in trust-based pension schemes lies with the trustees who can choose to delegate responsibility for administration but they retain ultimate accountability. Trustees need to ensure that what they have delegated is being delivered.

Franzen, (2010), notes that good scheme records, core function of the administrator, are critical for risk management because the success of a number of very important events during the life of a pension scheme such as transferring members between schemes, Investing member funds, De-risking of investments, Winding-up of schemes and actuarial valuation all depends on administrators record. Any of these events can be made onerous and costly if

your scheme's records are inaccurate or incomplete. The Retirement Benefits Act defines administrator of a scheme as a person appointed by trustees to administer a scheme in accordance with the terms and conditions of service specified in the instrument of appointment (KRBA, 2011). The Retirement Benefits (Administrators) Regulations, 2007 defines the role of an administrator as follows: i) Liaise with the trustees, the Authority, Kenya Revenue Authority, and the scheme service providers; ii) offer advisory and training services to the trustees, members and the Sponsor; iii) avail the required data of the scheme to the service providers iv) compute and pay benefits to the members and their beneficiaries v) prepare the scheme budgets, cash flows and liquidity requirements; vi) offer secretarial services to the Board of Trustees vii) advise the trustees to ensure that the manager is investing the scheme funds in compliance with the provisions of the Act.

Types of Pension Schemes Administration

Pension boards that lack administrative functional competencies should outsource those functions subject within the legal regulations (Ambachtsheer, Capelle, & Lum (2007). Two types of pension schemes administration have been identified in literature; In-house administration and outsourced administration.

In-house Pension Scheme Administration: According to the Kenya Retirement Benefits (Administrators) Regulations, 2007 a pension scheme is referred to in-house if it is administered by persons who may be employees of the scheme or the sponsor (KRBA, 2011). In-house administration may be of the form whereby the administration personnel are all employees of the sponsor and the administration is run as a department or section of the scheme's sponsor's arrangement. In-house administration can be of the form whereby the trustees recruit a natural person as administrator and also employ other administrative staff.

Outsourced Administration: According to the Retirement Benefits (Administrators) Regulations, 2007 and outsourced administrator a company incorporated under the Companies Act which is empowered under written law, memorandum of association or any other instrument constituting it or defining its powers to carry out administration services. The administrator under this arrangement relies on sponsor data and information and thus the sponsor may have dedicated personnel to offer co-ordination often referred to principal officer (Halim, Miller, & Dupont, 2010).

Benefits and risks of outsourcing: Outsourced administration S promotes ease of risk management by a pension scheme, some advantages offered arising are: Higher level of flexibility, with less restriction from the rules existing in the company; Increased responsiveness to customers' needs; Providing special services to the customers through outsourcing without the need to hire special skill workers; Reduction of capital investment and labor; Access to the innovations and developments of more specialized pensions providers; Reduction of cost technology sharing and benefits of economies of scale (Friedman & Miles, 2002).

Risk of Outsourcing Pensions Administration: Some of the risks associated with outsourcing are: Lack of control on the quality of the product/service provided by the members of pension scheme; Low level of attention to member's needs; No motivation to offer enhance support to staff and sponsor (Franzen, 2010),.

Qualification of administrator

The qualifications and skills of an in-house administrator (natural person) is prescribed under the Retirement Benefits (Administrators) Regulations, 2007 that; a natural person rendering administration services shall be academically and professionally qualified in matters relating

to insurance, law, accounting, actuarial science, economics, banking, finance, investment of scheme funds or has more than five years' experience in matters relating directly to pensions and administration of schemes (KRBA, 2011).

Computer Systems Support

According to Michele and Gibbs (2008), computer Systems that supports are the programs designed to support attainments of given objective by use of computers. The key role of administration is accurate record keeping and determination of benefits and thus computer systems should be applied. According to the Pensions Management Institute (PMI) a pension's administration system is a mandatory requirement in the modern day pension's management (PMI, 2010). Administration of pensions should have a systems that effectively and efficiently perform; Benefits Administration support; Accounting function; Member. This study investigates the influence that the pension scheme administration has on adoption of risk management.

2.4.6 Adoption of risk management strategies

A pension scheme is said to be adopting risk management strategies if it has a plan of action of attending to risks such as having a frame work of defining risks, analysis and predetermined probable course of actions to attend to risks if they arise (Ambrogio & Elisabetta, 2010). Risks of pension Schemes in Kenya are have been categorized into market risk, operational risk, governance risk, sponsor insolvency risk and counterparty fraud risk (KRBA, 2012). Studies have suggested that pension scheme can come up with strategies to mitigate the risks which may include; coming up with business continuity plan, employing a chief risk officer, outsourcing risk management to a consultant, having a board committee dealing with risks and coming up with a risk registers (Beasley, Clune, & Hermanson, 2008).

According to the Association of Insurance and Risk Managers (AIRM), drivers of risk management as modeled in figure 2.12 in an organization can determine the overall exposure to the particular type of risk under consideration based on Financial risk, Marketing place risk, reputational risk and infrastructure risk all falling into internal and external factors categories that give rise to risks (AIRM, 2010).

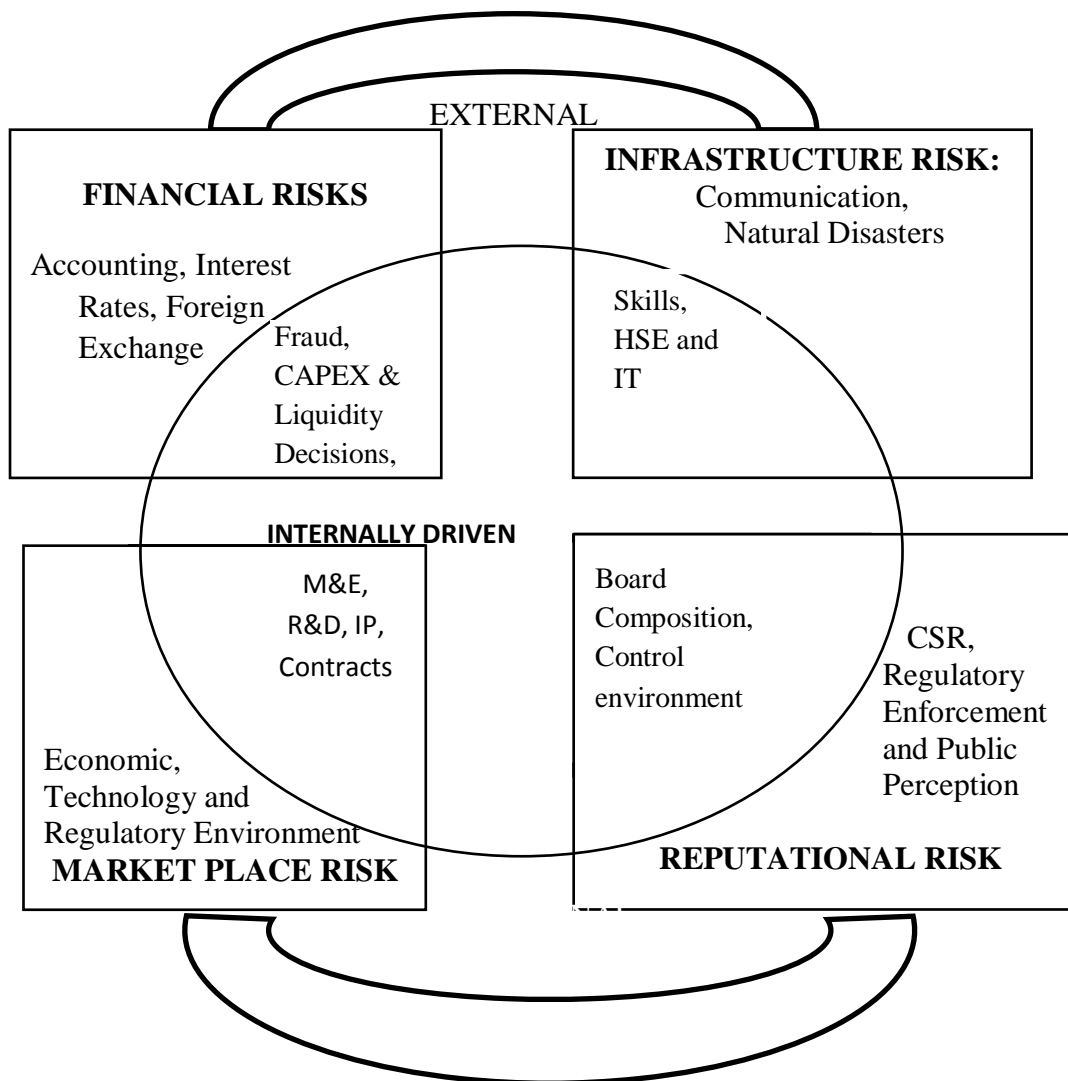


Figure 2.12: Model of risk management drivers. Source AIRM, (2010)

2.5 Empirical Literature Review

This section, details empirical literature of past studies in line with the identified variables in the conceptual model Figure 2.9, page 37. The purpose of empirical literature review was to identify gaps that this study would focus as an addition to the body of knowledge.

Board of Trustees Composition

Harper (2008) undertook a study on Board of Trustee Composition and Investment Performance of US Public Pension Plans. The study examined the relationship between the composition of the board of trustees of a pension plan and several facets of performance. The basic research question for the study was the impact of board composition on fund performance. Specifically the research questions arising from the objectives were does board composition, especially the impact of outside independent trustees; affect the investment performance of the fund by increasing fund return? Does board composition affect the target asset allocation of the fund (and the appropriate benchmark)?. To what extent are investment and risk management decisions driven by board composition and the overall funding level of the plan.

Using a sample of US public sponsored pension plans, a longitudinal survey using data from 71 pension plans from fiscal years 2001 – 2005 was collected by use of mail questionnaires. To test the impact of board governance structure and composition on investment performance, simultaneous panel estimation methods was used. The findings showed that, there is no relationship between board composition and characteristics and investment performance as measured by the excess return of the fund. From the findings, the study recommended that there is a need to examine the impact of board composition on the risk management practices.

A study by Kostyuk and Koverga (2006) on the main tradeoffs on Board size and composition examined the influence of board size and composition on risk management decisions. The purpose of the research was to find the factors influencing size and composition of the supervisory boards in particular reference to Ukraine transition economy. The methodology of the research was comprised of first, use of questionnaires delivered to Heads of Supervisory Boards and Deputy-Heads of Supervisory Boards of 240 companies. At the second stage of research, observation was used where 50 companies whose directors had provided questionnaires completed were observed. The sample is on the research of 50 largest companies in Ukraine for a period of research 17 years that is from 1998 to 2005.

The research found that there is strong dependence of the size of supervisory boards in Ukraine on the degree of concentration of corporate ownership and origin of the controlling shareholder. Size of the company has a very conditional influence on the board size. Professional skills diversification as a fact that could contribute to the efficient work of the supervisory board is still very weakly developed in Ukraine. Particularly this concerns such expertise as auditing, finance, executive compensation. Only 24 per cent of members of supervisory boards have a five and more year experience as supervisory board members. Members had the strong links with the company in the past as executives. Thus, about 74 per cent of members of the supervisory boards in Ukraine worked as executives of the same company at least during a year for the last ten years. This makes the negative impact on the independence of the members of the supervisory boards.

Pension Scheme Size and Adoption of Risk Management

Golshan and Rahid (2009) undertook an empirical Analysis study of Malaysian public listed companies on the determinants of Enterprise Risk Management (ERM) adoption. The aim of the paper was to gain insights to the influential factors that impulse risk management

adoption among firms. The study design was exploratory seeking to identify the determinants for adopting risk management. The objectives of the study were find out the influence of; a size in implement risk management, complexity of firms to adoption of risk management, a firm's sector influence on adoption risk management, audit firm on adoption of risk management and the firms having a composition of the Board with independent directors

The researcher used content analysis of the 993 Malaysian quoted companies by searching various terms that are an indication of adoption of risk management. The first level sample was a total of 284 (consisting of 142 risk management adopters and 142 non risk management adopters). Simple random sampling was used to select 90 the (sample of the study) companies out of the 284. Secondary Data was collection from published reports. The findings of the researchers were that the presence of big four auditors and the pressure of regulations are the major drivers of adoption of risk management.

Hoyt and Liebenberg (2006) research on the determinants of risk management adoption among the insurance companies had the following key research objectives: To investigate the determinants of risk management among the insurance companies, To find out the degree of influence of pension scheme size in adoption of risk management of the insurance companies and the influence of ownership structure on adoption of risk management by insurance companies. The authors took a sample of 275 United States insurance companies for the period 1995 to 2004. This study objective was to determine factors for insurance companies to practice Risk Management and to estimate the relationship between Risk Management and firm value.

The study used financial reports, newswires, and other media for evidence of Risk Management activities. Using Probit Regression, the study employed five independent variables: size; percentage of institutional ownership; international diversification dummy;

industrial diversification dummy; and life insurance dummy. Adoption of risk management noted as dummy 1 = user, 0 = else was the independent variables. The results of the study indicated that size, institutional ownership and international diversification were significant in determining risk management adoption. The study found out that the size of insurance company as measured by asset value plays a significant role in adoption of risk management strategy. The study also concluded that the adoption of risk management has a strong relationship with the academic of board, size of the insurance and age of the owners of the Company.

As an improvement to the study by Hoyt and Liebenberg (2006), Pagach and Warr (2007) undertook an empirical investigation of the characteristics of firms adopting risk management by use of larger sample of risk management adopters, more variables and different model to test the data. Their sample size was 145 against a population 1,245 banks and utilities companies. The results of their study indicated that increased in leverage at 10 percent will increase 7.8 percent for companies to hire Chief Risk Officer (CRO).

Regulatory requirement and adoption of risk management

KPMG International Survey study on Driving Enterprise-Wide Risk Management (KPMG) sought to determine why and how U.S. companies are actually implementing risk management within their operations and business lines (KPMG, 2006). The key survey objectives were to determine the factors driving risk management efforts and Companies' risk assessment, management and communication activities. The study data collection method was the use of e-mail questionnaire and interview guide. A Sample of 265 executives against a population of over hundreds of thousands of executives who have responsibility for, or influence over, strategic decisions on risk management in their companies were selected based on a stratified random sampling method. The findings of the study were that the drivers

to adopting risk management include: First, organization desire to reduce potential financial losses (68 percent); second the organization desire to improve business performance (64 percent); Third, due to the regulatory compliance requirements (58 percent) and the organization desire to increase risk accountability at 53% (KPMG, 2006). From the findings, the authors recommended that that further study need to be undertaken of the drivers of risk with use of more variables such as in in a different financial sector.

McNulty, Florackis and Ormrod (2012) study of Board structure and process on corporate governance and risk focused on boards of directors and risk, undertaken against the backdrop of the financial crisis of 2008. The study set out to understand the conditions and arrangements through which boards may exercise responsibilities for risk. Specifically, the objectives of the study were to: ascertain the board structures and processes in place before the 2008/2009 crisis and relate board arrangements to their companies', financial and business risks as evidenced by company data over the period 2007–9, identify board structures and processes that are important to boards' exercising responsibility for risk. The study was conducted over a period of 12 months commencing March 2010 the study is based on a unique set of qualitative and quantitative data for a large sample of UK-listed companies. These data was collected through a survey of company chairs, secondary data about boards and companies' risk, and interviews with directors, both executive and non-executive, in late 2010 and early 2011.

In the study, measures of board structure were constructed using secondary data with variables being: board composition, board committee and director characteristics. Measures of board process were based on a questionnaire survey about board working and effectiveness. The study used a combined quantitative (regressions) and qualitative (survey and semi-structured interviews) methods to shed light on the inner workings of boards and

how these relate to risk management. The findings results were: First, in testing the formal structures of boards, financial risk-taking was lower in boards that were smaller in size, that is, fewer than eight directors. The proportion of non-executive directors and the existence of risk committees were not found to have any significant effect on corporate risk.

Second, in examining the impact of director characteristics, financial risk-taking was lower where the board tenure of executive directors was significantly greater than that of non-executives. Also, there was some evidence of higher financial risk-taking in companies where executive director remuneration was significantly greater than that of non-executives. *Third*, in analyzing board behaviour financial risk-taking was lower where non-executive directors had high effort norms (as evidenced by the conduct of board meetings; preparation for board meetings and the frequency of dialogue between executives and non-executives) and where board processes were characterized by a healthy degree of cognitive conflict, that is, differences of opinion over key company issues and board tasks. The study recommended a study to be carried out on the linkage between board structure and risk adoption after the financial crisis and examines whether corporate governance variables to do with board structure and process have significant explanatory power.

Price-Water-House Coopers (PWC) examined the Adoption of Risk Management practices among 26 Finnish companies (PWC, 2004). The aim at of the survey was to provide an independent and objective perspective on the maturity of the risk management process and function in Finland, outlining how much progress companies have made in ERM implementation. The key objectives of the study survey were to identify; current focus areas in corporate risk management, Current and planned risk management related functions in companies, current and planned risk management processes at the enterprise level. Initially sample of the study was 43 of the 60 largest companies in Finland (excluding financial

institutions and insurance companies). The study survey interviews were completed by 26 of the 60 largest companies in Finland. The methodology used was personal interview with senior personnel, based on a questionnaire. The participating companies selected the most appropriate person(s) to complete the survey, in most cases, interviews were conducted with the Chief Risk Officer (CRO), CFO or equivalent. The results of the survey were; firms in Finland are motivated to implement risk management because of; First, over 96% of the users want to adopt good business practice; more than 81% due to corporate governance pressure; 42% stated it gives them a competitive advantage; and More than 30% comes from regulatory pressure and also investment community pressure (PWC, 2004).

Kleffner, Lee, and McGannon (2010) investigated the effect of corporate governance on the use of enterprise risk management. Kleffner, Lee and McGannon, (2010) study specifically focused on public listed companies in Canada. The sample size of their study was 389 and the respondents were 336. The study collected data by using response to a mail survey questionnaire sent to Canadian Risk and Insurance Management Society members as well as telephone interviews with 10 of the respondents. The respondents were primarily in charge of risk management in the respecting company to establish forces that drive companies to adopt risk management strategies. The findings of the study showed that 31% of the respondents had adopted holistic risk management model (Enterprise Risk Management). The authors also found out that the factors influencing companies to adopt risk management are: influence of the risk manager (61 percent); encouragement from the board of directors (51 percent); concern for directors' and officers' liability (28 percent); and compliance with Toronto Stock Exchange (TSE) guidelines (37 percent). Hoyt and Liebenberg's (2009) quantified the value to a firm of implementing ERM. In their study of US insurers they find that risk management premium of 16.5% is statistically and economically significant.

Daud and Yazid (2010) developed a conceptual framework to adoption for the adoption of risk management in government linked companies (GLC). The researchers investigated the relationship between quality of Risk Officer and Risk Management adoption in Malaysia. The study was on the level of Enterprise Risk Management adoption within Malaysian companies and the quality of Chief Risk Officer in implementation of Enterprise Risk Management. The study focused on four levels of adoption of Risk Management: complete adoption in place; partial adoption in place; planning to implement in risk management; and investigating to adopt risk management.

The author's specific objectives were to: determine the level of adoption of ERM among the Government Linked Companies in Malaysia, examine whether the quality of risk officer and quality of Board affect the level of adoption of risk management and to investigate whether the quality of internal audit moderates the relationship between the risk officer presence and the adoption of ERM. Questionnaires were sent to 500 companies through mail from seven types of industry such as Technology, Industrial Product, Property, Consumer Product, Plantation, Trade and Services and Construction. Among these, only 89 respondents participated in the study. The researcher basically reviewed literature, developed hypothesis and made conclusion without subjecting the hypothesis to any test. The results of the study showed that only 43 percent of various companies have complete ERM program while 57 percent were considered as partial. The study also found that the quality of risk management and Risk Management were significant indicating that a Risk Officer is an important factor for companies to adopt ERM.

Njuguna (2012) undertook an exploratory study on critical success factors for a micro-pension plan. The study sought to determine models for implementation of micro-pension plans, regulatory issues surrounding their operations, challenges to implementation and the

strategies that can address the challenges. The data, collected from 1,083 informal sector participants in Kenya and data was analyzed by use of factor analysis and visual binary approaches. The study concludes that there are risks (issues) on governance, administrative, design and efficiency in micro-pensions implementation and recommended a multi-model implementation of micro-pension plans in addition to a separate set of regulations to govern the micro-pension plans.

Portfolio Structure of the Scheme, Regulation and Pension Scheme Size

Halim, Miller and Dupont (2010) in their study sought to determine how pension funds manage investment risks. The survey-based study main objective was to find out how large global pension's funds manage investment risk from strategy to implementation. Specific objectives of the study were to find out how successful funds have been in managing risk, documenting the range of risk adoption drivers and practices used, and investment beliefs that drive risk adoption, measurement and management behavior and identifying risk measures that might be useful for ongoing benchmarking. Samples of 58 pension scheme were selected from USA (24), Netherlands (3), and Europe *minus* Netherlands (6), Australia (7) and Canada (18). The survey approach was purposive selecting on pensions funds that were willing to participate in the benchmarking exercise. The findings were that most funds (88%) have adopted risk management strategies usually through controlling tracking error in their portfolio asset classes.

The researchers also found out that global differences in regulation regarding risk measurement and management have a major impact on how funds view the importance of risk management adoption. For example Financial Accounting Standards Board, which regulates financial reporting in the United States, requires corporate funds to use marked-to-market, and thus regulation plays a significant role in adoption of risk management. The also

concluded that investment beliefs which determines the portfolio of a scheme assets drive risk management adoption with 66% of the respondents strongly agreeing that the investment beliefs plays a crucial role in adoption of risk management. The researchers also found out that the approach to risk monitoring is related to fund size valuations of their liabilities in their financial statements; of the 88% of funds that measure management risks, over half adopt risk budgeting. Larger funds are more likely to use risk budgeting than smaller ones.

On a different study but in Kenyan context, Rono (2009) undertook a study focusing on the analysis of factors influencing pension fund managers' investment decisions, basing on the Kenyan Pension Schemes. The objectives of the study were to identify investment options available to pension fund managers, identify factors that are considered by fund managers when making investment decisions and identify risks faced by fund managers in making investment decisions. The researcher's methodology was survey questionnaire selecting a sample of three representatives from each of the twelve registered fund managers to complete the study questionnaire. The study found out that returns, investment risks and trends in interest rates were the most important factors affecting pension managers' investment decisions. Decision-making preferences, investment portfolio, past performance and legal framework were rated as less of a risk. The research also recommends separation of the promotion of retirement funds and regulatory functions to avoid conflict of interest in the two roles.

Pension Administration and adoption of risk management

Tariki and Georges (2011) investigated on risk determinants based on decisions to manage risk by firms. The key objectives of the study were: to find out the influence of managerial risk aversion on adoption of risk management by firm, to investigate the influence of maximization of firm value on adoption of risk management and to extent the testing of

Tufano (1996) risks management adoption with more sample data: The methodology of the study was observation and secondary data of 887 quarter-company risk management observations for a period of eight years, relative a population of 45 companies. Secondary data was collected from the company's reports. Data was analyzed using multiple equation analysis and logistic regression model. The findings of the study were first, was that risk management adoption is dependent of the administration and managerial risk aversion. Secondly, financial distress costs and information gap were found to be important determinants of risk management.

Wanjohi, Wanjau and Anyango (2011) study on the role of pension schemes on motivation of employees, *sought* to investigate the role of occupational pension schemes as a motivator as used by employers as a vehicle to promote work motivation and job satisfaction. The study was a case of Tuskys Supermarkets in Kenya. The objectives of the study were: the management commitment, establishment of whether Pension administrators influence the pension scheme and the role of Trustees in running of the pension schemes. The methodology of the study was descriptive survey, using a questionnaire, and the targeted population of 10 management staff and 30 employees. The study findings were that employees were satisfied with the way the scheme is administered and that they were motivated by the pension scheme in their performance.

2.6 Critique of literature

Hoyt and Liebenberg (2006) carried a study on the determinants of adoption of risk management among the insurance companies. The study found out that the size of insurance company as measured by asset value plays a significant in adoption of risk management. The age and academic qualifications of shareholder's were also found to have a significant role in adoption of risk management ant author suggested that this will apply to the financial sector

firms. The study, whereas it shades light on the board composition, qualifications of the board and size, it failed by generalizing a study in the insurance sector that it can apply to all sectors of financial, therefore future research need to be undertaken on pension schemes.

Pagach and Warr (2007) undertook a study using a proportional hazard model to examine characteristics of firms hiring a Chief Risk Officer (CRO) and the role of regulatory needs. CRO is a proxy to adopting risk management; their main conclusion is that firms adopt holistic risk management for direct economic benefits and not just to comply with regulation. In their study approach they used a probabilistic approach which no empirical data collection to test the presumptions (hypothesis). Their study is purely on the corporate sector, and has revealed in extant literature pensions is a unique sector. The argument in this study is that adoption of risk management goes beyond regulations and direct commercial benefit to the firms but also can be applied in social security sector such as pension schemes. Without collecting primary data, the conclusion from this study can be subjective. There is therefore a need to undertake further study which the methodology entails collecting primary data.

Halim, Miller, and Dupont (2010) carried out a study on how pension funds in building their portfolio manage investment risks. They sample of 58 pensions pension scheme based on a purposive selection approach. The findings was that most funds (adopted risk management by structuring their portfolio and that global differences in regulation regarding risk measurement and management have a major impact on how funds view the importance of risk management adoption. on pensions funds that were willing to participate in the benchmarking exercise. The shortcoming of this study is that the sample size is too small to draw firm conclusions, thus there is a motivation to undertake a study with a larger sample.

Kostyuk and Koverga (2006), examined the influence of board size and composition on risk management decisions in Ukraine transition economy and found out that Board Size and

Composition professional skills diversification and the main tradeoffs corporate board contribute to the efficient work of the supervisory board is still necessary for risk management. The study was done in one country, a country that was just transitioning from war with weak structure of governance. There is a need to replicate the study in a different economic set up.

Bergmann (2012) empirical study generated insights into the associations between risk management and; firm size, firm complexity, board diversity and board size looks by examining Danish companies in the medium and large-cap segment. This study was done in a developed country and one may need to replicate the study in a developing economy. In the Kenyan context is by Njuguna (2010) who conducted a research on the performance efficiency of pension schemes in Kenya largely focusing on the return side of performance. One may need to undertake research on risk side of efficiency particularly on adoption of risk.

2.7 Research gaps

In the adoption of risk management, the findings in the reviewed literature as discussed in the previous sections of this study shows that causes the adoption of risk management in pension schemes remains blurred? Scant literature both theoretical and empirical on the causes of adoption of risk management is revealed from the literature. Globally risk management, being an integral part of strategic management, is a widely researched areas of financial management of business enterprise and corporate finance but gaps do exist in the following area; the risk management in the pension sector is largely ignored, no record show research that has been done in Kenya in the strategic context of exploring risk management adoption in the pension sector. Secondly, although their exist record of research on strategic efficiency of pension schemes in Kenya (Njuguna, 2010), the study did not address the variables that are

captured in this study and the focus was not in risk management adoption of risk management of the pension schemes.

The likelihood of adopting risk management strategies influences by the Board of Trustees composition, Size of pension schemes, Regulation requirements, Portfolio structure and Administration structure. Studies on adoption of risk management by corporate entities in developed countries such as USA, Netherland and Australia were noted. This study therefore seeks to fill these gaps and add to the body of knowledge by focusing on risk management drivers among the occupational pension scheme in a developing country, Kenya.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the methodological subjects and specifies the research design. Various aspects of the research design such as the constructs used in the study, development of the survey instrument, selection of sample, execution of the survey, data analyses techniques and procedure and assessment of the sample re discussed. The first section of this chapter describes the research design, the study population, and the study sample. Sections two and three of this chapter are the exposition of the population and sampling frame respectively. The subsequent sections of this chapter cover the explanations of the proposed instruments of data collection, procedure of data collection, pilot test and data analysis.

According to Saunders, Lewis and Thornhill (2009), choosing the effective method of research is weighty since the results depend on the method employed. Easterby-Smith, Thorpe and Jackson (2008) suggest that research should consider the theoretical and philosophical matters as a basis to assist the researcher to clarify the research design. Myer (2009) argues that research should move from the underlying philosophy to research design then to data collection. The development of the methodology in study this followed the basic outline discussed by Hoehn (1991) that six (6) factors which must be addressed in a research methodology; the target population, the sampling procedure and the sample, description of the research design, instrumentation, data collection procedures, and data analysis.

In this study, the basic approach followed was that of theory testing through empirical research. A set of testable research questions raised in chapter one was tested on the basis of

theoretical underpinnings and the findings of previous studies. Conclusions in this study have been derived from answered research questions using survey data

Research philosophy

This study is based on Epistemology which is a branch of philosophy concerned with the theory of knowledge, attempting to provide answers to the questions; How, and what, can we know? (Willig, 2011). Positivism which is an epistemological position generally informs quantitative research by advocating the application of the methods of the natural sciences to the study of social reality and beyond (Bryman, 2004).

This study took a broadly post-positivistic position. Post-positivism has refined the views and beliefs of positivism, the view that advocates the application of the methods of the natural sciences to the study of social reality and beyond (Bryman & Bell, 2003). The driving force in research can be either practice driven or theory driven (Zikmund, 2010). Post-positivism acknowledges that the theories, hypotheses, background knowledge and values of the researcher need to be taken account of and can influence what is observed. According to post-positivism a reality does exist but it can be known only imperfectly because of the researcher's limitations (Bryman & Bell, 2003).

3.2 Research Design

This study adopted a descriptive survey research design. Research design and architectural planning have much in common According to (Leedy, 1997). Creswell (2004) refers research design as the entire process of research from conceptualizing and idea, literature review, methodological approach to writing the conclusion. According to Easterby-Smith, Thorpe and Jackson (2008), research design is the way the research is organized, how evidence will be gathered, where the evidence will be found and how the evidence will be interpreted.

Research design is glue that holds all the elements of research together (Kombo & Tromp, 2006). Blumberg, Cooper and Schindler (2011) defined a research design as the plan and structure conceived to obtain answers to research questions. Mohibir (2008) defines research design the grand plan in framing the methods and procedures for the collection and analysis of data, creating a structural approach for the requirement of the research.

3.3 Study Population

The population of this study was all the pension schemes registered by the Kenyan Retirement Benefits Authority, which are one thousand three hundred and eight (1,308) consisting of 1,216 occupational pension schemes, 64 individual retirement schemes and 23 operating with interim registered schemes (KRBA, 2012). Population of a study is a complete group of entities sharing common features (Zikmund, 2010). This study targeted population was the 1,216 occupational pension schemes registered with the Kenya Retirement Benefits Authority as at June 2012. According to Cox (2010) target population is the entire set of units for which the study data will be used to make inferences.

This study targeted occupational pension schemes because they face a unique risk since they are voluntary creations of the employers and thus can also be closed by employers' if the performance of the scheme cannot be tenable. The targeted population can be grouped as per the two designs Defined Benefits pension's schemes or a Defined Contribution pension schemes since the level risk perspective of the two designs differs. The unit of analysis in this study was a pension scheme. Table 3.1 shows the percentage distribution of the two types of pension's schemes.

Table: 3.1: Category per design of the scheme of respondents

Category	Target Population	Percentage (%)
Defined Benefits	101	11%
Defined Contributions	1,115	89%
Total	1,216	100

Source: KRBA, (2012)

3.4 Sample and sampling procedure

The criteria adopted in selection of the sample for this study was the pension scheme must be an occupational scheme registered with the Kenya Retirement Benefits Authority as at June 2012. Stratified random sampling was applied to ensure that the two types of pension schemes are represented. According to Blumberg, Cooper and Schindler (2011) stratified method of sample selection is appropriate when getting a sample from a heterogeneous population. A sample is a representative of total population nominated for analysis (Kothari, 2009; Bryman & Bell, 2003). Gall, Borg and Gall (2008) defines a sample as a carefully selected subgroup that represents the whole population in terms of characteristics. Orodho (2003) notes that sampling is a procedure of selecting a representative of a population on which research can be conducted and inferential conclusion from the study can be applied in general terms to the entire population. Borg, Gal and Gal (2008) define sampling as a process of selecting a number of individuals in such a way that they represent the large group.

A statistical technique provided by Mugenda and Mugenda (2008) suggest that a sample of 10% is sufficient to represent a population and recommends a criteria for selecting a sample size was adopted as a model for a sample for this study as follows:

$$n = (z^2 pq)/d^2$$

Where:

n = is the desired sample size when the target population is > 10,000

z = standardized normal deviations at a confidence level of 95% which is 1.96

p= the proportion in the target population that assumes the characteristics being sought. In this study, a 50:50 basis is assumed which is a probability of 50% (0.5).

q = The balance from p to add up to 100%. That is 1-P, which in our case was 1- 50% (0.5)

d = Significance level of the measure, that is at 95% confidence level the significance level is 0.05.

From the target population the sample for this study can be derived as follows:

$$n = (1.96^2 \times 0.5 \times 0.5)/0.05^2 = 384$$

Our target population in this study is less than 10,000, thus the sample of 384 can be adjusted as follows using the following formula suggested by Mugenda and Mugenda (2008).

$$n_f = n/(1+n/N)$$

where n_f = the desired sample size when sample size is less than 10,000

n = the sample size when the target population is more than 10,000

N = the population size

In this study therefore $n_f = n/(1+n/N) = 384/(1+384/1,216) = 292$

In line with the recommended minimum sample size required for different population sizes at 95% confidence level and +/- 10% sampling error, this study a sample of 192, following the

guidelines provided by Salant and Dillman (1994) was taken. The sample sizes shown in the Table 3.2a are based on the assumption that the population is relatively varied (Salant & Dillman, 1994). The study sample of 192 was above 10% of this study population (10% of population is 121) as recommended by Mugenda and Mugenda (2008) and was also above the 93 minimum suggested by Salant & Dillman (1994).

Table 3.2a: Sample size at 95% confidence level

Population (N)	Sample Size (n)
100	49
250	70
500	81
750	85
1,000	88
2,500	93
5,000	94
10,000	95
25,000>	96

Source: Salant and Dillman (1994)

Sampling Frame

The unit of analysis for this study is a pension scheme, and thus the respondent were either scheme administrator, trustee, principal officer or a pension's officer of the scheme. The sample of occupational pension schemes for the survey was selected from a list of all registered occupational pensions schemes from the Retirement Benefits Authority publications (KRBA, 2012). The KRBA registered schemes became the sampling frame for this study. According to (Demsey, 2003), sampling frame is a source list from which sample respondents has to be drawn. Nachmias and Nachmias (2008) define sampling frame as a list

of all the possible items where a representative sample may be drawn for the purpose of a study.

The stratum from the list was categorized based on two pension scheme designs, Defined contributions scheme and Defined Benefits schemes. Altogether there were 1, 216 occupational pension schemes in the sampling frame; Defined Benefits schemes (101) and Defined Contribution schemes (1,115). These two designs were the stratus in the random. As indicated in section 3.4, the sample size appropriate for this study is 192 respondents, which is 16% of the population. Based on stratified random sampling, the respondents for each stratum was as shown in the sample distribution, Table 3.2b.

Table 3.2b: Sample Distribution

Category	Target population	Percentage (%)	Frequency
DB Scheme	101	8	15
DC Scheme	1,115	92	177
Total	1,216	100	192

The target respondents for this study were the senior officials of the pension schemes namely; Trustees, Administrators, Principal officers or Pension Scheme officers. The survey questionnaires were addressed to the chairman Board of trustees with clear instructions on the target respondents. A mixed mode survey was used whereby some questionnaires were e-mailed and others by face to face filling of questionnaires in expectations of getting a high response rate. According to Cui (2003), different combinations of administering a survey questionnaire increases the response rate.

3.5 Data collection procedures

Due to the nature of the study, triangulation was found to be necessary as suggested by Nachmias and Nachmias (2008) who noted that triangulation involves the use of more than one form of data collection to test the same hypothesis. Zikmund (2010) suggests that a survey research must give an opportunity for direct participation by respondents. A number of researchers within the social sciences field have advocated combining research methods and stressing the importance of triangulation (Mingers, 2011; Mingers and Brocklesby, 1997; Armstrong, 2011). In this study, the primary data collection methods that can attain direct participation are; the personal interview, observation and the questionnaire.

The triangulation approach can broadly be defined as the combination of methodologies in the study of the same phenomenon (Armstrong, 2011). Triangulation can be between methods and within-method; The “within-method” triangulation is used when multiple techniques within a given method are used to collect and interpret data. An example of “within-method” triangulation is comparison of a number of cases. The “between-methods” approach to triangulation is related to the situation where the use of multiple methods is used to examine the same dimension of a research problem. Different methods are applied in the data collection related to the present study thereby leading to “between-methods” triangulation. The triangulation can, capture a more complete, holistic, and contextual portrayal of the unit(s) under study (Armstrong, 2011). In this study a three phase approach was used to achieve the benefits of triangulation. The field of inquiry approach was in a stepwise manner and using different means of data collection methods; first direct observation as a qualitative, exploratory approach was applied in the preliminary phase. Secondly, the next phase used semi-structured interviews were performed and the third and

the final phase was the field inquiry using questionnaires. This approach is schematically presented in Figure 3.1.

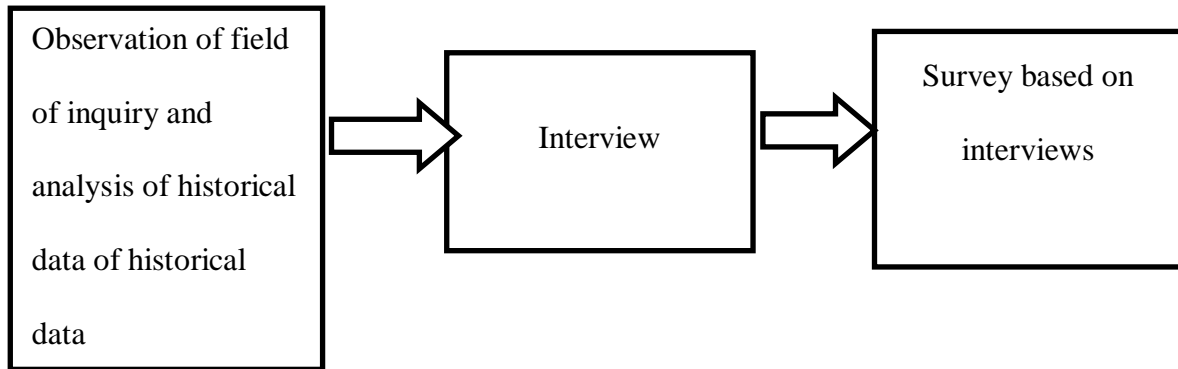


Figure 3.1: Data collection approaches

Observation

Some variables like board of trustee’s composition, regulatory framework and pension scheme size required use of the questionnaires combined observation as a way of taking note of the non-verbal behaviour of the respondents. A more structured process was used to collect primary data yielded primary data while the study of archival data provided secondary data. Both sources were used as tools to get insight into the survey.

Interviewer administered questionnaire

There are many different types of interview which fit the label of quantitative and qualitative research interview (Mingers, 2011); one of these is the semi-structured research interview which was used in this study. Interviewer semi-structured interviews were used in order to get a more multi-faceted view of the field of inquiry. Semi-structured interviews could be categorized as quantitative data even though they do necessarily not meet the rigorous demands that characterize surveys (Armstrong, 2011). However, the semi-structured interview leaves room for unstructured data both in the form of speech, atmosphere, and other

rich sources of information. The interviewer administered questionnaire method was used as a basis of serving purposes; the interview guide and the use of questionnaire as an instrument. The choice of questionnaire was based upon the wide coverage of respondents, the time frame allotted for the study and the cost considerations of the research project (Sproull, 1988).

A set of questions was used in this study to enable the respondents, be prompted along the thought of board of trustee's composition, pension scheme size, regulatory framework, portfolio structure and pension's administration structure. According to Saunders, Lewis and Thornhill (2003), interviewer administered questionnaire method which involves interviewer physically meeting the respondents and asking questions face to face usually has a higher response rate than a self-administered questionnaire.

Survey questionnaire

Due to the size of the target population and the corresponding sample size used, it was deemed that the most appropriate form of non-experimental study would be the survey method. The main instrument used in this study was a survey questionnaires whereby the respondents participated directly by filling the questionnaires. The respondents were assured of anonymity and the questions order was counter balanced (Podsakoff, Mackenzie, Lee & Podsakoff, 2003). This additional approach is known to have effect of neutralizing method biases that affect the retrieval stage by controlling the retrieval cues prompted by the question context (Lee & Podsakoff, 2003). In developing the questionnaire items, both closed-ended and open-ended formats of the item were used in all categories of the questionnaires was used.

Following the procedure used by other researchers (Sim & Killough, 1998; Ittner & Larker, 1995; Ahire & Drefus, 2000), the questionnaire survey asked the respondents to indicate their factual information and perception based on a likert scale for both the variables. Some of the response was anchored on a five point likert scale as recommended by Zikmund (2010) which ranges from ‘very high extent’ to ‘very low extent’ (a scale of 1- 5, where 5 = Very high extent, 4 = High Extent, 3 = Moderate extent, 2 =Low extent and 1 =Very low extent) was used in this study. Likert scales are widely used in business research (Zikmund, 2010). The rationale of using a questionnaire for a survey is that the collection of primary data that is assembled and prepared specifically for the research (Zikmund, 2010). Appendix 1 of this study shows the questionnaire used for this study. The questionnaire was divided into seven sections; six of which sought the data on the variables of this study and one was to seek general information.

The sections of the study questionnaire were as follows. Section 1 covered general information of respondents whereby the general information of the respondents such as Age, marital status, level of education, pension scheme type, respondents’ position in the scheme, work experience and number of employees in the pension scheme were sought to find. It also served the purpose of the preliminary study. Section 2, covers on the first variable of the study namely board of trustees composition (BOT). In this section questions are set derive from respondents the operationalized constructs of BOT composition to enable the finding out the board of trustees composition of pension schemes and the influence of board of trustees composition on the adoption of risk management by occupational pension schemes.

Section three of the questionnaire dwelt on Pension scheme size. This section contained items that sought to find out the pension scheme size of the sampled schemes and how the respondents feel they influence the adoption of risk management by occupational pension

schemes. Section four covers questions on Regulatory Framework. This section contained questions that sought to find out the influence of regulatory framework in Kenya, on adoption of risk management by occupational pension schemes. The respondents were expected to indicate their perception based on a likert scale. Section five dealt with Portfolio structure of the pension schemes. The questions in this section focused on the portfolio structure items of the pension schemes and how they influence adoption of risk management by occupational pension schemes.

Section six of the questionnaire is on the Administration Structure of the pension schemes. This section sought to find out from the respondents how the pension schemes administration set up had influence on the adoption of risk management by occupational pension schemes. Section seven Influence the Likelihood of adoption of risk management strategies by pension schemes.

3.6 Pilot Study

The survey questionnaire was pilot tested with 15 randomly selected occupational pension schemes which constituted 8% of the sample population. The survey questionnaire was modified in line with the comments received from the respondents. The pilot data was tested for reliability using the cronbach alpha. According to Blumberg, Cooper and Schilder (2011) a pilot test is aimed to show; the duration it will take complete the questionnaire, confirm clarity and logical flow of format, confirm if the questions are clear and short, and to test the questionnaire credibility and should constitute at least 1% of the sample size. The pilot test in this study was within the aforementioned recommendations.

3.6.1.1 Reliability

Reliability concerns the extent to which an experiment, test or any measuring procedure yields the same results on repeated trials (Carmines & Zeller, 1979). Leedy (2004) suggests that, to be reliable, each instrument must consistently measure the factors for which they were designed to measure. In research involving questionnaire data the internal consistency indices of reliability are useful (Hatcher, 1994). One criticism of adoption and diffusion research is that testing the reliability of measurement instruments has only been done sporadically (Moore & Benbasat, 1991). One of the most widely-used indices of internal consistency reliability is Cronbach's coefficient alpha (Carmines & Zeller, 1979; Cronbach, 1951).

The Cronbach's coefficient alpha ranges from 0 to 1. It is a measure of reliability not a statistical test (Carmines & Zeller, 1979). To assess the construct reliability, that is the extent of measurement error in a measure, this study used Cronbach alpha (Neuman, 2003). Cronbach coefficient alpha is used as a measure of reliability in relation to the operationalization of the constructs. Reliability and validity are important issues in the measurement of research variables both concerned with the accuracy of measures or indicators, though it is virtually impossible to achieve perfect reliability and validity (Neuman, 2003). A scale is considered to have good reliability if it has an alpha value greater than 0.60 (Zickmund, 2003).

Refining of our scale started with computing reliability coefficients (Cronbach's alphas), in accordance with Churchill's (1979) recommendation. Because of the multidimensionality of the independent variables' constructs, Cronbach's alpha was computed separately for the determinants of each variable to ascertain the extent to which the items making up each variable shared a common core. This study minimum test of reliability is based on Cronbach alpha of 0.70. Cronbach's alpha test was generated by Statistical Package for Social Sciences

(SPSS) explained in section 3.3. The results showed that the measurement constructs included in the final questionnaire had cronbach's alpha greater than 0.7.

3.6.1.2 Validity

Validity is the ability of a test to measure what it is supposed to measure and are applied to test whether the questionnaire measures what it aimed to measure (Zikmund, 2010). Validity was assessed based on the responds from the pilot test. To reduce the threat to content validity, experts in the area of study were asked to give their opinion on the instrument so as to judge the appropriateness. The expert opinion confirmed to the researcher that the content in depth and breadth are suitable to the study. Internal validity on control of extraneous variables was addressed by making the question simple, straight forward and free from ambiguity. For external validity the model applied in this study was stratified random sampling to ensure representation of heterogeneous pension schemes and thus giving credence to generalization.

3.7.1 Factor Analysis

Different methods have been proposed for discarding or reducing variables. Fomby, Hill and Johnson (1984) discussed two methods. The first method simply suggests deleting principal components associated with relatively small characteristic roots. Given that the variations in the data are measured by the characteristic roots, such a technique would still preserve as much variation in the data as before. However, the limitation of the method lies in its inability to provide insight on the appropriateness of the restrictions. The second method emphasizes sequential test restrictions implied by deleting components with increasingly large characteristic roots.

Kaiser (2008) and Kaiser (2009) provided guidelines on the appropriateness of factor analysis measure of sampling adequacy (MSA) values that the values can be interpreted as follows: Above 0.80 - excellent, above 0.70 - good, above 0.60 - average, above 0.50 - miserable and below 0.50 - unacceptable. Hair, Black, Babin, Anderson and Tatham (2006) have suggested that for conducting factor analysis, the MSA value of the variables should be at least 0.50. The above three checks were carried out in this study prior to conducting factor analysis. Hair, 2006).

Ledesma and Valero-Mora (2007) assert that factor analysis has advantages that: both objective and subjective attributes can be used provided the subjective attributes can be converted into scores; factor Analysis can be used to identify hidden dimensions or constructs which may not be apparent from direct analysis; it is easy and inexpensive to do. The main purpose of conducting a factor analysis was to summarize the information contained in a number of original variables into a smaller number of factors without losing much information that is the newly created variables should represent the fundamental constructs which underlie the original variables (Gorsuch, 2010; Rummel, 2008). Factor analysis is an interdependence oriented technique whose main purpose is to define the underlying structure among the variables in the analysis. Factor analysis provides the tools for analyzing the structure of the interrelationships among a large number of variables by defining sets of variables that are highly interrelated, known as factors (4.3.1 Factor analysis

Factor analysis could be described as orderly simplification of interrelated measures, traditionally used to explore the possible underlying structure of a set of interrelated variables without imposing any preconceived structure on the outcome (Child, 1990). Factor analysis based on communalities analysis was conducted with all the five items in the scale and the resultant are as shown in appendix 3 Table 4.4a. Principal Component Analysis (PCA) was

used in this analysis to scale down the large number of potentially relevant explanatory variables included in the empirical model. The use of all 41 constructs in the multivariate logistic analysis would lead to the problem of too few degrees of freedom and therefore, required the need for fewer variables. PCA consists of a multivariate technique for examining relationships among several quantitative variables. It allows for exposing linear relationships among a larger set of variables and obtaining fewer uncorrelated components which retain much of the information in the original data (Isebrands & Crow, 1975; Hutcheson & Sofroniou, 1999).

3.7 Data Analysis

This section details the techniques that were used in this study to analyze and test data. Before processing the responses, data were prepared by coding, cleaning data checks were made to identify any reverse coded values and missing values but none were found. The data collection method and type of research instrument used resulted in the need to apply Statistical Package for Social Sciences (SPSS) for descriptive and inferential statistical to determine statistical parameters. Saunders, Lewis and Thornhill (2009) recommend that in business research, structured grids are appropriate method of data preparation, since it makes allocation of responses easily identified and placed. Detailed information regarding the responses to each of the questions can be found in chapter four of this study.

Descriptive statistics namely mean, frequency and percentages was used. Data was coded and analyzed simultaneously as collected. Through content coding, a list of key ideas and themes for each variable was generated and this guided the nature of integration needed for both qualitative and quantitative data collected. Views and ideas that were frequently expressed were noted. This formed the basis for crosschecking and comparing the two sets of data and drawing of conclusions. Data was then operationalized through scoring for crosschecking

with the quantitative data The data were analyzed and presented in form of diagrams and graphs prepared from the SPSS. The findings were then used to test if it answer research questions raised in chapter one. Quantitative data was analyzed using descriptive statistics and measures of central tendency. Logistic Scatter plots were used to show if the existed a logistic degree of influence of independent and dependent variables. SPSS software version 19 was used as a statistical tool for analysis.

Descriptive statistics

Descriptive is usually used at the beginning of the analysis phase in order to provide preliminary analysis of the data and guide the rest of the data analysis process (Cooper and Schindler, 2006). According to Bryman and Cramer (2001) and Stephen and Hornby (1995), Descriptive statistics enable the researcher to work out a number of statistical procedures, such as frequency distributions, frequency Tables, percentages , minimum, maximum, sum and means, as well as graphical presentations of frequencies and values in order to describe and/or compare variables numerically.

In this study the response rates were tallied and recorded so that the information could be made into graphs to identify the prominent issues that influence adoption of risk management. These graphs will be presented in chapter four of this paper.

Statistical Tests and Model

The research questions of this study posited two way interactions between adoptions of risk management and the dependent variables. Therefore the depended variable (Y) in this study is the adoption of risk management strategies and dependent variables are; Board of trustees composition, size of pension schemes, portfolio structure, regulatory requirements and administration structure of pension scheme. The identified independent variables are certain

while the dependent variable the level of adoption of risk management (Y) is dichotomous. To answer the research questions, this study used Logistic Regression Model which has been recommended by a number of researcher that it is well suited for studying relationship between a categorical or qualitative dependent (outcome) variable and one or more predictor variable as recommended by Peng and So (2002) and also suggested by Cohen and Cohen, (1983). A coefficient assigned to an independent variable is interpreted as the change in the logit (log odds that $y = 1$), for a 1-unit increase in the independent variable, with the other independent variables held constant. Logistic regression estimates the log odds as a linear combination of the independent variables. A predicted logit for case i is obtained from the solved logistic regression equation:

$$\text{logit}_i = b_0 + b_1x_{i1} + b_2x_{i2} + b_3x_{i3} + \dots + b_m x_{ik}$$

The predicted probability model is given by:

$$P_i = \exp(\text{logit}_i) / [1 + \exp(\text{logit}_i)]$$

This value serves as the Bernoulli parameter for the binomial distribution of Y at the values of X observed for case i . Logit values can range from $-\infty$ to $+\infty$ and their associated probabilities range from 0 to 1. Multiple Logistic Regression (MLR) model, the log odds or logit of p_i equals the natural logarithm of $p_i/(1-p_i)$.

$$\text{Logit}(p) = \beta_0 + \beta_1x_1 + \dots + \beta_K x_K$$

Thus for this study the $\text{Logit}(p) = \beta_0 + \beta_1x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5$

where

$(\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5)$ = maximum likelihood estimates of the logistic regression coefficients

X_1, \dots, X_k = are column vectors of the values for the independent variables.

The formula for the probability itself is as follows:

In this study the dependent variable (Y) was assumed to take value 2 or 1, where 2 refers to adoption of risk management and 1 for non-adoption. The model for this study was developed in line with the MLR model described above. The predictors (dependent variables) identified in this study were: Board composition, Size of the scheme, Regulatory requirements, Portfolio Structure of the Scheme and pension scheme administration.

Step 1: Independent variables denotations:

Let X_1 = Board composition

Let X_2 = Pension scheme size,

Let X_3 = Regulatory requirements,

Let X_4 = Portfolio structure of the scheme and Let X_5 = pension scheme administration.

Step 2: Dependent Variable

Let Y_1 = 2 (Adopted risk Management Strategies),

Y_2 = 1 (Not Adopted Risk Management Strategies)

Step 3: Logistic Function

In presenting the assessment of logistic regression results, researchers should include sufficient information to address the following; an overall evaluation of the logistic model, statistical tests of individual predictors, goodness-of-fit statistics and an assessment of the predicted probabilities. For other data sets, these three tests may not lead to similar conclusions, when this happens, reliance should be based on the likelihood ratio and score tests only (Menard, 1995).

Testing significance of independent variables

In this study, the responses on adoption of risk management strategies by pension schemes (dependent variable) are dichotomous outcomes, coded as $Y = 2$ for the outcome of interest (denoted a “Success = Adopted RMS ”), and $Y = 1$ for the other possible outcome (denoted a “Failure=Not adopted RMS”). One other difference between OLS and logistic regression is that there is no R^2 to gauge the variance accounted for in the overall model (at least not one that has been agreed upon by statisticians), instead, a chi-square test is used to indicate how well the logistic regression model fits the data (Chuang, 1997). We use p to represent the probability that the “success” outcome occurs. The probability of a “failure” outcome is then $1 - p$. Adoption of risk management (Y) is a binary variable. So our model becomes a model for the probability of a “success” outcome x

The computed chi square value was compared with the Table value of chi square at 5% level of significance. Inferences and conclusions on the research variable was made based on the

logistic output of the variables as shown in Table 3: 3. The hypothesis tested for each variable took the form as follows:

$$H_0: \beta_k = 0$$

$$H_1: \beta_k \neq 0 \text{ for } K= 1, 2, 3, 4, 5.$$

Classification approach in a logistic model.

Generally the higher the overall percentage of correct predictions the better the model, however, there is no formal test to decide whether a certain percentage of correct predictions is adequate and also it is easy to construct a situation where the logistic regression model is in fact the correct model and therefore fits but classification is poor (Cohen,2003).

The Likelihood ratio test

A logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only model (Press & Wilson, 1978). According to Cohen (2003), Maximum Likelihood (ML) test is a way of finding the smallest possible deviance between the observed and predicted values and the final value, which is called deviance or negative two log likelihood ($-2LL$). This tests the difference between $-2LL$ for the full model with predictors and $-2LL$ for initial chi-square in the null model. It measures of how well the model explains variations in the outcome of interest.

Cox and Snell's R^2 test

The most common assessment of overall model fit in logistic regression is the goodness-of-fit test (G), which is simply the chi-square difference between the null model (i.e., with the constant only) and the model containing one or more predictors (Cox & Snells, 2006). Cox

and Snell's R^2 is an attempt to measure the association but its maximum is less than 1, hence making it difficult to interpret.

Cox & Snell Pseudo- R^2

$$R^2 = 1 - \left[\frac{-2LL_{null}}{-2LL_k} \right]^{2/n}$$

Nagelkerke's R^2 (or adjusted R^2) test

Nagelkerke's R^2 divides Cox and Snell's R^2 by its maximum in order to achieve a measure that ranges from 0 to 1. According to Peng and So (2002), logistic R^2 measures are not measures of goodness of fit but rather an attempt to measure the strength of the association. Nagelkerke modified Cox and Snell version to make 1.0 a possible value for R-squared. The correction increases the.

Nagelkerke Pseudo- R^2

$$R^2 = \frac{1 - \left[\frac{-2LL_{null}}{-2LL_k} \right]^{2/n}}{1 - (-2LL_{null})^{2/n}}$$

The Hosmer - Lemeshow (H-L) Goodness-of-Fit Test

A test of the overall fit of a model to the observed data that can be used is the Hosmer and Lemeshow (H-L) test (Hosmer & Lemeshow, 2000). The idea is to form groups of cases and construct a "goodness-of-fit" statistic by comparing the observed and predicted number of events in each group; the cases are divided into a number of approximately equal groups based on values of the predicted probability such that the differences between the observed number and expected number (calculated by summing predicted probabilities based on the model) in each group are then assessed using a chi-square test (Hosmer & Lemeshow, 2000). If the H-L goodness-of-fit test statistic is greater than .05, as we want for well-fitting models,

we fail to reject the null hypothesis that there is no difference between observed and model-predicted values, implying that the model's estimates fit the data at an acceptable level. Well-fitting models show non-significance on the H-L goodness-of-fit test. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed.

Hypothesis:

Ho: There is no difference between the observed and predicted values

H1: There is a difference between the observed and predicted values

Measurement of variables

Constructs of each item of the variable were measured by scale as summarized in Table 3.3.

Table 3:3 Measurements of Variables

Variable	Indicator	Measurement
Board of Trustees Composition	- No of Trustees	Ordinal
	- Gender Mix	Categorical
	- Number of sponsor nominated trustees	Ordinal
	- Number of elected trustees	Ordinal
	- Number of pensioners Trustees	
	- Number of independent Trustees (not pensioners and not employees)	
	- Qualifications of trustees	
Pension Scheme Size	- Number of Active Members	Ordinal/categorical/interval
	- Number of Pensioners	
	- Value of Assets	
	- Number of sponsors	
Regulatory Requirements	- Governance Compliance reports	Ordinal/categorical
	- Investment regulations	
	- Appointment of service providers	
	- Board of trustees regulations	
Portfolio Structure	- Interest bearing assets	Ordinal/categorical
	- Equity unquoted and Quoted	
	- Off-shore investments	
	- Property	
	- Number of asset classes	
Pension Administration	- Operational efficiency of scheme	Ordinal/categorical
	- Processes and procedure	
	- Management information system	
	- Management style	
(Dependent Variable) Adoption of Risk Management	- External Audit	Ordinal/categorical
	- Board Committee	
	- Risk consultant	
	- Risk officer	
	- Investment policy	
	- Pension administration software	
- Control systems.		

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents empirical results of data analysis in line with the research design described in chapter 3. The data were collected and then processed in response to the research questions posed in chapter 1 of this dissertation. The research results are presented in a quantitative manner utilizing the descriptive statistics and inferential statistical tools. The results are presented in accordance with the order and form of the questionnaire in order to address each research question.

4.2 Response rate

The research questionnaire instrument was administered to the sampled target population as indicated in chapter 3. One hundred and seventy two surveys were sent to occupational pension schemes out of which, 5 were sent to occupational schemes that were in the process of liquidation. Therefore, 167 surveys were considered to be legitimate for this research. The returned questionnaire were 132 but 6 was not considered usable, thus the usable questionnaires analyzed for this study were 126. De Vaus (2002) has suggested that response rate is equal to the Number of questionnaires returned) divided by sample size and the result multiplied by one hundred. Using the formula the response rate for this study is: Response rate = $126 / (192) \times 100 = 66\%$. According to Rogers, Miller and Judge (2009) a response rate of 50% is acceptable in descriptive social studies hence the response rate for this study at 66% is sufficient for analysis and inferential conclusions of the population.

4.3 Pilot study results

Reliability

The Cronbach's alpha values obtained for each of the constructs and the values reported in this study are as shown in Appendix 2 total variance explained. The lower limit of acceptability for Cronbach's alpha value is 0.7 is acceptable (Robbins & Judge, 2007). This implies that they are all strongly loaded thus these variables measure adoption of risk management and Board of trustee's composition constructs. All the measures have Cronbach's alpha values greater than 0.7 which fall in the acceptable limit.

Factor Analysis

A principal components analysis with varimax rotation was conducted and this was tested to show whether the extracted latent variables are uncorrelated as they should be. As shown in the Table 4.1 total variance explained, six components that had Eigenvalues of either 1 or greater than 1 were retained. 100% of the total variance in the original variables is explained by the 6 components retained. From Table 4.4b, the factor loadings results in the components matrix are good loading since all the original variables load the components by at least values above 0.5. From the matrix it can be seen to which components each of the variables belong. A variable belongs to the components it loads highest with a loading above 0.5. Expert opinion from the regulators at KRBA and scholars in risk management were used to test the reliability.

Table 4.1: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	22.687	31.467	31.467	22.687	31.467	31.467
2	15.229	22.465	53.932	15.229	22.465	53.932
3	13.234	12.982	66.914	13.234	12.982	66.914
4	12.479	11.885	78.799	12.479	11.885	78.799
5	9.283	11.342	90.141	9.283	11.342	90.141
6	7.749	9.859	100	7.749	9.859	100
7	9.32E-13	4.23E-12	100			
8	9.16E-13	3.76E-12	100			
9	9.08E-13	2.96E-12	100			
10	9.04E-13	2.83E-12	100			
11	9.05E-13	2.52E-12	100			
12	8.15E-13	2.26E-12	100			
13	7.13E-13	1.98E-12	100			
14	6.64E-13	1.85E-12	100			
15	5.9E-13	1.64E-12	100			
16	4.94E-13	1.37E-12	100			
17	4.53E-13	1.26E-12	100			
18	4.17E-13	1.16E-12	100			
19	4.14E-13	1.15E-12	100			
20	3.59E-13	9.99E-13	100			
21	3.28E-13	9.1E-13	100			
22	3.03E-13	8.41E-13	100			
23	2.65E-13	7.35E-13	100			

24	2.49E-13	6.91E-13	100
25	2.24E-13	6.22E-13	100
26	2.07E-13	5.75E-13	100
27	1.96E-13	5.43E-13	100
28	1.63E-13	4.52E-13	100
29	1.09E-13	3.03E-13	100
30	1.01E-13	2.8E-13	100
31	9.2E-14	2.55E-13	100
32	7.8E-14	2.17E-13	100
33	7.7E-14	2.13E-13	100
34	5.5E-14	1.52E-13	100
35	3.9E-14	1.08E-13	100
36	3E-14	8.5E-14	100
37	-1.02E-015	-2.24E-015	100
38	-1.61E-015	-2.61E-015	100
39	-2.01E-025	-3.11E-015	100
40	-2.19E-015	-3.81E-015	100
41	-2.98E-015	-4.14E-015	100
42	-3.13E-015	-4.47E-015	100

Validity

Validity was tested by determining the average variances of the extracted latent variable and comparing with the covariance between the variable and other latent variables. Discriminant validity Table 4.2 shows the covariance matrix of the six latent variables extracted using Kaiser Rotation method. Kaiser rotation method retains only factors with Eigen values greater than 1, meaning that unless a factor extracts at least as much as the equivalent of the

one original variable, it will be dropped (Kaiser, 2009). From the matrix shown in Table 4.2a it can be seen that the average variances of the latent variables extracted compared with the covariance with other latent variables, the average variances extracted are all equal to 1 which is higher than the covariance between the latent variables which are all equal to 0.

Table 4.2a: Latent Variables Covariance Matrix

Component	1	2	3	4	5	6
1	1.000	.000	.000	.000	.000	.000
2	.000	1.000	.000	.000	.000	.000
3	.000	.000	1.000	.000	.000	.000
4	.000	.000	.000	1.000	.000	.000
5	.000	.000	.000	.000	1.000	0.000
6	.000	.000	.000	.000	0.000	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

4.4 General Information

Profile of respondents and their respective pension schemes

In this study the sample consisted of 126 occupational pensions' schemes that filled and returned the questionnaires. Table 4.1 and Figures 4.1 4.2 and 4.3 provides a detailed demographic profile of the respondents.

4.4.1 Age of the respondents

The study findings indicate that majority of the trustees and administrators (respondents), 55.6%, were in the age bracket of between 31 and 45 years of age. The respondents who were of age bracket above 45 years of age were 8% while those below the age of 30 years were

4%. The results also showed that 8.7% of the respondents were above 55 years. The age is considered as a significant factor in risk management and has an influence in a person's perception and embracing of risk even in its functional duties (Hoyt, 2012)).

Halim, Miller and Dupont (2010) their study on adoption of enterprise risk management, found out that 51% of the governors of pension schemes who determine risk management strategy were above the age of 30 years. Our study findings are consistent to Halim, Miller and Dupont (2010) findings. The study results imply that that age has a linkage to level of responsibility pension scheme. Hoyt and Liebenberg (2006) observed that the risk appetite varies with age and the younger persons will tend to be aggressive will less attention to risk management while the old are more conscious of risk. From this the response in this study the trend of the age of the respondents is in conformity with the earlier studies whereby majority of the governors of pension scheme were above 50 years. We conclude then the findings of this study supports earlier studies findings on the average age of governors of pension schemes. Figure 4.1 show the respondent's age distribution.

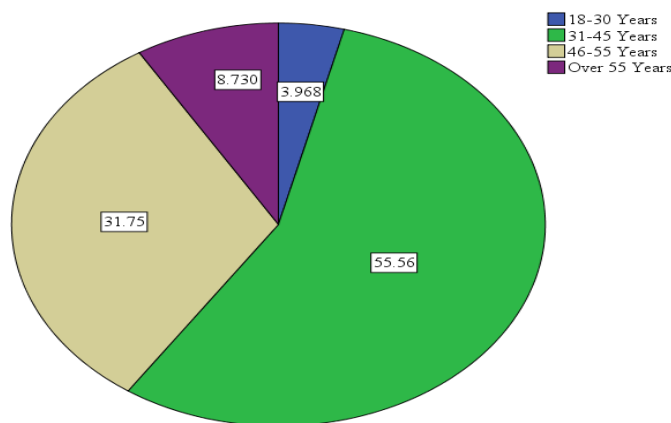


Figure 4.1: The respondents age (years) percentage distribution

4.4.2 Pension scheme type

The research findings as shown in Table 4.2b indicates that 12% of the respondents were running defined benefits schemes while 88% were from the defined contribution schemes. This is consistent with population data base from the Kenya Retirement Benefits registered occupational schemes which have about 89% of the occupational schemes being of the Defined Contribution type (KRBA, 2012). According to Stewart (2010), the type of pension scheme drives the risk management structure, since the responsibility of risk varies with the type of scheme.

The global pensions statistics report Towers Pensions Survey (TW), there is a gradual trend of pension schemes shifting from defined benefits to defined contributions with an estimated ratio of 1:6 for defined benefits and defined contributions schemes respectively (TW, 2011). The finding of this study confirms the general global trend in pension type operations and the structure of the schemes in the Kenyan Retirement Benefits Industry (KRBA, 2012).

Table 4.2b Type of Pension Schemes

	Type of scheme	Frequency	Percentage
Type of Pension Scheme	Defined Benefits	15	11.9
	Defined Contribution	111	88.1
		126	100

4.4.3 Gender of the respondents

The findings of the study showed that 69% of the respondents (trustees and administrators) were male while the female were 31%. The Kenyan constitution of 2010 provides a gender balancing requirement in state offices and this may cascade to other officeholders (RoK,

2010). It is thus prudent to conclude from the above results may be attributed to cultural set up in Kenya where the male dominate leadership positions and women are relegated to lower level tasks. This contradicts the spirit of the Kenyan constitution 2010 which provides for gender fairness (RoK, 2010). This may be inferred to be in bargain with the biblical writings which places man as the head. Figure 4.2 shows the gender distribution of the respondents.

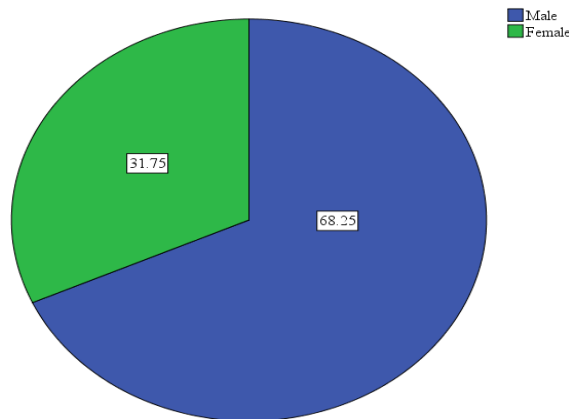


Figure 4.2: Gender distribution (in percentage) of the respondents

4.4.3 Position of respondents

From the results of the study, majority of the respondents were Trustees at 40%. The Administrators, Principal Officer and Pension Officer were 21%, 13% and 26% respectively. In a pension scheme the trustees are the overall responsible of the assets while the administrators perform delegated authority of the trustees (KRBA, 2012). The mix of respondents reduces the biasness that could have arisen if one category of respondent could have been targeted given that the unit of analysis in this study is an occupation pension. The results of this study confirm the proportion of trustees per pension scheme compared to administrator given that an occupational pension scheme is allowed to have up to nine trustees (KRBA, 2011). Figure 4.3 shows a bar graph of percentage distribution of the occupation of the respondents.

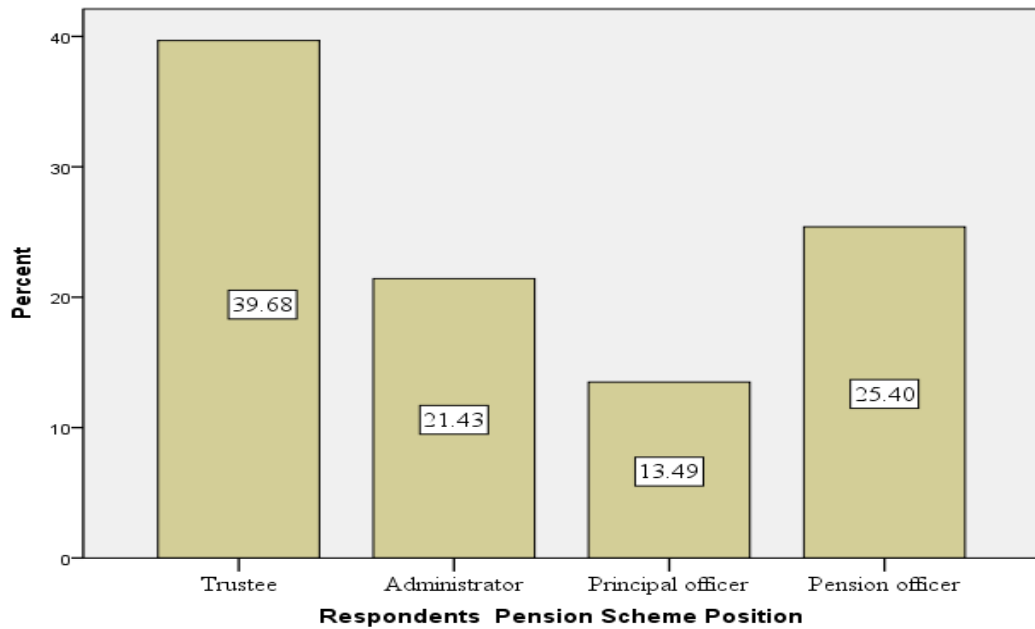


Figure: 4.3: Percentage of the occupation of respondents.

4.4 Study Variables

Dependent variable - Adoption of risk management

The dependent variable in this study is adoptions of risk management; six constructs were used as measures of adoption of risk management. The nature of responses take a binary form that is answers type can either be existence of adoption of risk management (Yes) or nonexistence of the measure (No). The nature of the dependent variable response is in line with the logistic regression model used in this study. From Table 4.2c majority of respondents (70.6%) indicated that they have adequate internal controls in the organizations, while 54% had a systems software in their scheme. For the other four measures, majority of the respondents did not have the indicators in their scheme with the results being; having a board audit committee 41%, Risk consultant 38%, risk officer 18% and regularly conducting internal audit 37%. The summary of the results are as shown in Table 4.2c.

Table 4.2c: Frequency distribution measure of adoption of risk management

Measure of adoption (constructs)		Frequency	Percent (%)
Having a board audit committee	No	74	58.7
	Yes	52	41.3
Have a risk consultant	No	77	61.1
	Yes	49	38.9
Having have a risk officer	No	103	81.7
	Yes	23	18.3
Software for security and efficiency	No	57	45.2
	Yes	69	54.8
Established adequate internal control systems	No	37	29.4
	Yes	89	70.6
Regularly conduct internal audit	No	79	62.7
	Yes	47	37.3

4.5 Analysis of structured interview results

The interviews were written down, for each of the interviewers questions. The analysis of the transcripts involved checking and reading several times as well the transcripts, in order to throw up new insights (Smith, 1995; Willig, 2011). The aim of this analysis was to ‘try to understand the content and complexity of interviewee’s meanings on questions in the questionnaire rather than take some measure of frequency (Smith, 1995). The analysis (IPA) followed that proposed by Smith (1995) and Willig (2001): The transcripts were analysed one-by-one and the analysis began with reading each transcript numerous times, noting anything significant, and looking for confirmation or inconsistencies with the survey results. The results of the interview analysis were in conformity with the quantitative data analysis

arising from the survey questionnaires. The approach served to confirm the validity of the responses to the survey questionnaire.

4.5 Observation results

A summary of the observations results are as shown in Appendix 6, which indicates that 95 % of the respondents were observed to be were found to giving honest information while 5% were found withholding some information. It was also found that 80% had indicated their number of trustees and names in their financial statements. Most respondents (94%) were well composed and keen to answer questions, 89% showed respectability and a warm reception. From the observation results it is plausible to infer that the outputs of the survey results are in tandem with observation results. The observation findings are shown in Appendix 6.

4.6 Analysis of independent variables

In this study, logistic regression model was used to analyses prediction of adoption of risk management by occupational pension schemes in Kenya. In situations where the dependent variable is dichotomous, the procedure is to use logistic regression, using the logit link as a basis of determining the impact of multiple independent variables presented simultaneously to predict membership of one or other of the two dependent variable categories (McCullagh & Nelder, 1989). Logistic regression aims at using independent variables and coefficients not to predict a numerical value of a dependent variable as in linear regression, but rather the probability (p) that it is 1 rather than 0 (belonging to one group rather than the other). In this study SPSS version 19 was used to fit the logistic regression model for analysis of the results in testing the effectiveness of independent variables.

The aim in this study is to quantify the relationship between the probability of a “success” outcome (Adoption of RMS = Y), π , and the explanatory variables X_1 (BOT Composition), X_2 (Pension Scheme Size), X_3 (Regulatory Framework, X_4 (Portfolio Structure) and X_5 (Pension Administration Structure) based on survey data. The estimation for logistic regression is performed using the statistical method of maximum likelihood estimation (De Vaus, 2002).

4.6.1 Board of trustees composition (BTC)

Objective 1: This study sought to examine if composition of board of trustees influences the chances of adopting risk management strategies by pension schemes in Kenya.

In this sub-section, the results of each of the constructs used to measure the board of trustees composition variable; board of trustee’s size, board diversity and qualification of trustees are discussed.

4.6.1.1 Board of trustee’s size

It can be seen from the bar graph in Figure 4.4, majority of the occupational pensions schemes have 8 trustees (32.5%) followed by 4 trustees (21.4%), 9 Trustees (15.1%) and 6 (12.7%) trustees in that order. This is consistent with the Kenyan Retirement Benefits Act requirement that a Board of trustees should have a minimum have three trustees and should not exceed nine trustees in total. The numbers of trustees elected by members were largely 4 which is in line with the regulatory requirement as provided by the KRBA that the member elected trustees should be at least 50% and 33.3% for the defined contribution and Defined benefits schemes respectively (KRBA, 2011).

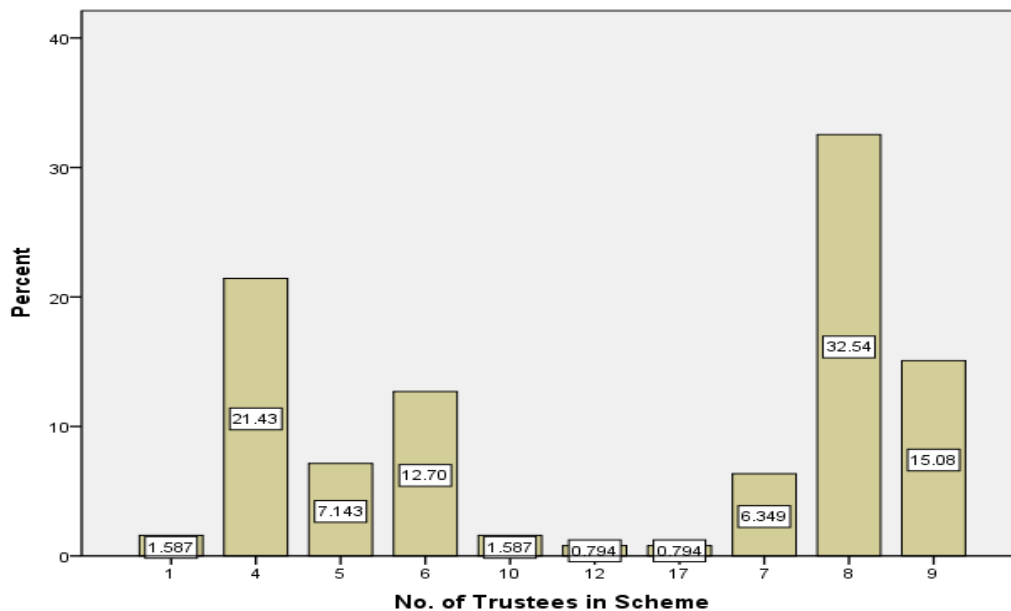


Figure 4.4: Percentage number of trustees

4.6.1.2 Board of trustees diversity

The findings showed that majority of the occupational schemes, 62.7%, have not chosen independent trustees to their boards. The practice of good corporate governance presupposes that a board should have at least one independent trustees (Bimuoth, 2010). The number of trustees who had an independent election board in their operations was 69%, an indication of good corporate governance. The findings collaborate with the results established by Fassin (2008) who noted that board of trustees mix are significant in risk taking approaches by organizations.

The study findings also relate to those of Hoyt (2011) who observed that the caliber and skills of the board is the key determine to risk management. The study by Hoyt (2011) also suggest that the principles of constituting boards and diverse representation influences the level of risk management adoption. Table 4.3 shows summary results of the trustees mix.

Table 4.3: Trustees mix

	Number of trustees	Frequency	%
	0	5	4
	1	13	10.3
No. of Elected Trustees by Membership	2	17	13.5
	3	29	23
	4	50	39.7
	5	8	6.3
	6	2	1.6
	8	2	1.6
Trustees Neither Pensioners Nor Employees	0	85	67.5
	1	27	21.4
	2	6	4.8
	4	8	6.3
No		87	69
Presence of Independent Election Board	Yes	39	31

4.6.1.3 Qualification of Trustees

The study revealed that 1% of the respondents had primary education and below, 14% had secondary education, 23% had diploma education and majority at 38% had Bachelor's degree, 21% had master's degree and 3% had PhD education. Kiragu (2010), observes that the level of education influences the impartation of managerial skills of most entrepreneurs. Education is credited as the key factor to change and is indisputable and has always been a central mechanism for transmission of skills and values for the sustenance of societies and promotion of social change (Ahire & Drefus, 2010). Figure 4.5 shows that 62% of the trustees have at least a bachelor's degree qualification.

It is noteworthy that the findings of this study are in tandem with the findings of Stewart (2009) who postulated that the skills and education level is the bedrock of management. The qualification of the trustees findings from this study are as shown in the Figure 4.5.

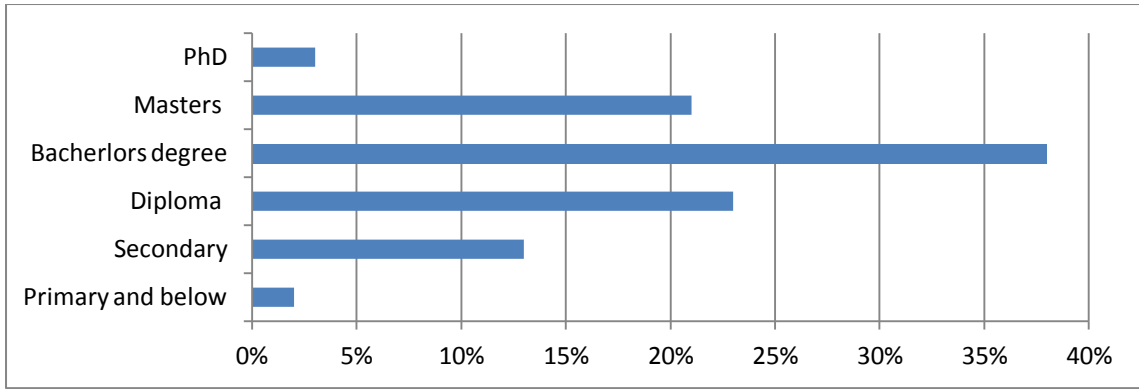


Figure 4.5: Trustees Levels of qualifications

4.6.1.1 Perception of Board of trustees influence on adoption of risk management strategies

The data from the survey questionnaire, were evaluated and analyzed using descriptive statistics, particularly, frequency distribution method. The aim of the analysis was to identify perceptions and experiences of the respondents (pension schemes trustees and administrative officers) on adoption of risk management. Table 4.4 shows that the mean of the various dimension used as measure the perception of the respondents on adoption of risk management is 46%.

This results shows that 46% of the respondents indicated that Board of trustees' composition influences to both great extent and vey great extent the adoption of risk management while 32% who were of the opinion that it has a lower influence (low extent and very low extent). Of the total respondents, 22% were of the opinion that the composition of board of trustees somehow influences the adoption risk management. The results are consistent to the finding of Kleffner, Lee and McGannon (2010).

Table 4.4: Composition of Board of trustees – Frequency distributions*

Construct	Very low extent	Low extent	Somehow	Great extent	Very great extent	Total
Gender	22.2	19	21.4	23.8	13.5	100
Sponsor Trustees	17.5	7.1	20.6	35.7	19	100
Elected Trustees	14.3	10.3	23	45.2	7.1	100
No. of Trustees	16.7	2.4	42.1	25.4	13.5	100
Pensioner Trustees	29.4	19	11.1	20.6	19.8	100
Trustees Qualifications	11.9	7.9	14.3	35.7	30.2	100
Independent Trustees	34.1	15.1	17.5	18.3	15.1	100.0
Average	20.88	11.54	21.42	29.24	16.88	100

**Figures are in percentage (%)*

4.6.1.2 Reliability test of board of trustees composition variable

A reliability analysis was conducted with all these seven items used to measure the board of trustee's composition variable. Cronbach's alpha value of 0.863 was obtained from the analysis using SPSS version 19.

4.6.1.3 Statistical modeling logistic regression

Board of trustee's composition and adoption of risk management strategies by pension schemes

The study sought to examine the influence of Board of trustee’s composition in adoption of risk management strategies. An examination of the logistic curve estimation of the relationship between Board of Trustees Composition and Adoption of risk management strategies suggest a positive relationship. Specifically this study tested the following hypothesis:

Null Hypothesis (H₀): The board of trustee’s composition does not influence the Likelihood of adoption of risk management strategies by pension schemes

Alternative Hypothesis (H₁): The board of trustee’s composition influences the Likelihood of adoption of risk management strategies by pension schemes

A scatter logistic curve as shown in Figure 4.6 shows an upward sloping relationship. This implies that the composition of board of trustees has impact on adoption of risk management.

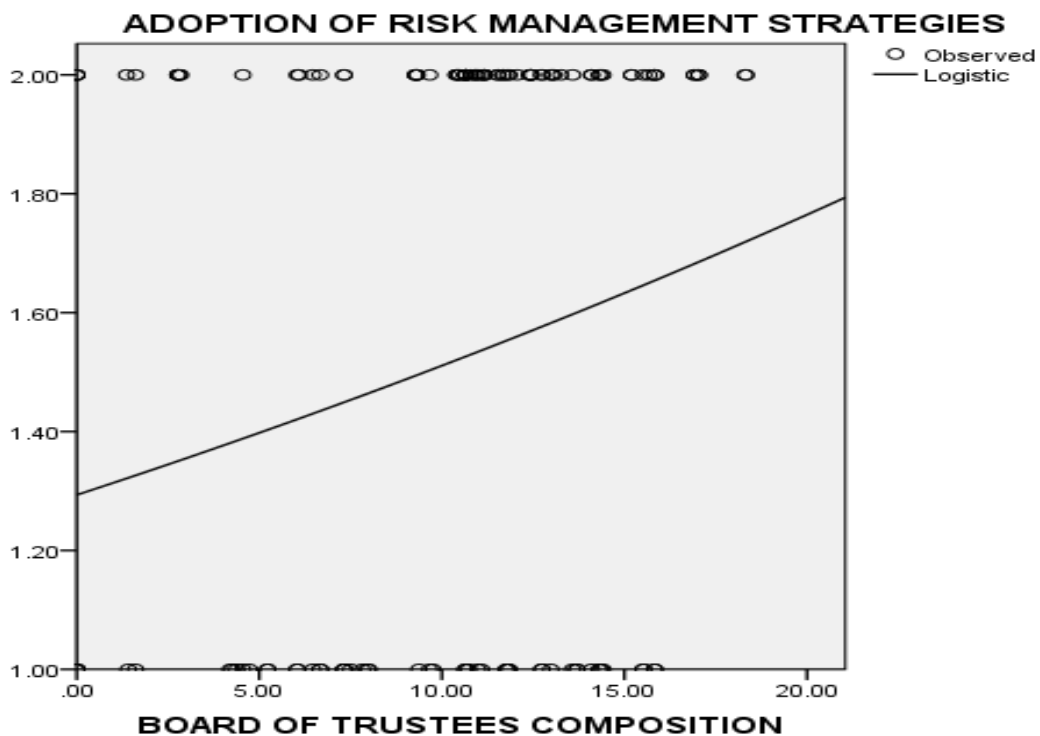


Figure 4.6: Scatter logistic curve estimation of Adoption of Risk Management and Board of Trustees Composition

i) Logistic regression analysis results - Constant only - Block 0: (Beginning Block)

One of the objectives of this study was to determine the influence of Board of trustee’s composition on the adoption of risk management. Logistic regression output are shown in terms of; results with constant only referred to as block 0, Classification model block 1 shows the results including the predictor variable board of trustees composition and a logistic model indicating variables in the equation.

ii) Classification model

Block 0, beginning block, presents the results with only the constant included before any coefficients of the independent variables are entered into the equation. The results as shown in the classification model under block 0 as shown in Table 4.5, the beginning, is compared with another model Table 4.6 that includes predictor variable Board of Trustees Composition in order to determine whether the latter model is more appropriate. From Table 4.5, the results as shown in the classification Table, indicates a classification rate of 59.5%. This implies that if without knowledge about our variables and guessed that an occupational pension scheme would not adopt risk management strategies the results would be correct 59.5% of the time.

Table 4.5: Block 0 Classification Table^{a,b}

a. Constant is included in the model. b. The cut value is .500

Observed	Predicted		Percentage correct
	Adoption of risk management strategies		
	1.00	2.00	
Step 0 Adoption of risk management strategies	1.00 2.00	0 51	.0
Overall percentage		0 75	100. 59.5

iii) Classification model block 1, constant and Board of trustees composition

When the predictor variable board of trustee’s composition is included in the model, the results under block 1 are as shown in Table 4.6 (Block 1). The results inclusive predictor variable boards of trustee’s shows that the prediction is now at 61.9%. Comparing the results with the output in Table 4.5, it indicates an improvement from 59.5% to 61.9%. This implies that the predictive power of the model is better when the Board of trustee’s composition is included.

Table 4.6 Block 1: Classification Table^a

Observed			Predicted		Percentage correct
			Adoption of risk management strategies		
			1	2	
Step 1	Adoption of risk management strategies	1	13	38	25.5
		2	10	65	86.7
Overall percentage					61.9

The cut value is .500

iv) Logistic Model Board Trustees Composition/Adoption Risk Management (Variables in the equation)

In a logistic model, Exp. (B), gives the relative odds or odds ratio for a particular explanatory variable, given the other explanatory variables in the model (Cohen, 2003). From the logistic regression model in this study, as shown in Table 4.8c, the results indicate that Exp (B) is 1.099. This implies that each unit of board of trustees composition change will lead to 1.099 times more likely for an occupational pension schemes to increase the chance of adopting risk management strategies.

From Table 4.7 the variable composition of Board of Trustees Composition (BTC) has a significance of 0.021, which is less than 0.05 hence the variable is significant and thus if included to the model would add to the predictive power of adoption of risk management.

Table 4.7: Logistic Model BTC/Adoption Risk Management

		B	S.E.	Wald	df	Sig.	Exp(B)
	Board of trustees composition	.095	.041	5.336	1	.021	1.099
Step 1 ^a	Constant	-.545	.440	1.536	1	.215	.580

a. Variable(s) entered on step 1: Board of trustees' composition.

The logistic model with Board of trustee's composition variable (X_1), while holding other factors constant, is as follows:

$$\text{Logit (Y)} = -0.545 + 0.095X_1$$

A further test of the beta coefficients of the constant shows that the constant at -0.545 is not significant since the significance (p values) is 0.215 which is greater than 0.05. However the BTC coefficient $\beta = 0.095$ is significantly different from 0 with a p value of 0.021 which is less than 0.05.

v) Likelihood ratio test - testing the significance of the model with BTC variable

A logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only (constant) model (Cohen, 2003). According to Cohen (2003), Maximum Likelihood (ML) test is a way of finding the smallest possible deviance between the observed and predicted values and the final value, which is called deviance or negative two log likelihood ($-2LL$). It measures how well the model explains variations in the outcome of interest. The $-2LL$ (deviance) has a chi squared distribution, thus the overall

significance is tested using the Chi square derived from the likelihood of observing the actual data under the assumption that the model that has been fitted is accurate (Chuang, 1997). In this study, adoption of risk management strategies by occupational pension schemes is our outcome of interest. From Table 4.8, the -2 log likelihood (-2LL) is 164.505.

Table 4.8: Likelihood Test - Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	164.505 ^a	.043	.058

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

vi) Hypotheses

The hypotheses to be tested in relation to the overall fit of the model is whether inclusion of an explanatory variable in a model tells us more about the outcome variable than a constant only model (that does not include that variable).

$$\text{Model 1: } \text{logit}(p) = \beta_0 + 0X_1 = -0.545$$

$$\text{Model 2: } \text{logit}(p) = \beta_0 + \beta_1 X_1 = -0.545 + 0.095X_1$$

Model 1 is nested within Model 2 that is it includes the constant in model and the independent variable X_1 . (X_1) are included in Model 2. The interest is in whether the additional explanatory variable in Model 2 (X_1) is required, that is does the simpler model (Model 1) fit the data just as well as the fuller model (Model 2).

The hypothesis tested was:

Ho: Additional variable does not improve the good fitting of the model

H₁ : Additional variable improve the model fitting

That is

$H_0: \beta_1 = 0$ against the alternative hypothesis that

$H_1: \beta_1 \neq 0$

Hypothesis testing results using the Likelihood test statistic are as shown in Tables 4.9 and 4.10.

Table 4.9: Chi-square - Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	5.569	1	.018
	Block	5.569	1	.018
	Model	5.569	1	.018

From Table 4.10, the value of -2LL when just the constant is included in the model is 170.074 compared with the value for the model that includes the variable X_1 which is 164.505. The Likelihood ratio test statistic is $170.074 - 164.505 = 5.569$. The results of this study as shown in Table 4.9 indicates that the model chi square has a value of 5.569 and a probability of $p = 0.018$.

Table 4.10 Likelihood test - comparisons of models

Model	- 2log Like hood
Model 1 (constant Only)	170.074 i.e. (164.505 + 5.569)
Model 2 (With X_1)	164.505

The value of the LR test statistic as shown in Table 4.10a is 5.569 and comparing it with a chi square distribution value Table at 5% level of significance, the cut-off value from the Table is 3.84. LR test statistics is too large relative to the Table value, hence the null hypothesis

should be rejected and conclude that the model that includes the variable X_1 (board of Trustees composition) is better at predicting adoption of risk management than the model with just the constant term alone. It implies that the increase or an improved trustee's mix in terms of diversity, level of education and board size increases the chances of adopting risk management by pension schemes.

The findings from this study that the composition of board of trustees influences the adoption of risk management are contradictory to the findings of Harper (2008) who found out in his study that there is no relationship between board composition and characteristic investment performance. However the findings of this study concur with the findings of Kostyuk and Koverga (2006) who found out in their study that supervisory board size has a very conditional influence on board size as a consideration on trustees composition including the gender mix exists at a significant level, suggesting an influence on corporate decision making such as risk management approaches. It can therefore be inferred from this study that risk management adoption strategies in a pension scheme is a resultant factor of the qualification of trustees and diversity.

4.6.2 Analysis of pension scheme size variable

Objective 2:

The study sought to establish, as its objective number 2, how pension scheme size effects on the probability of adopting risk management strategies by pension schemes in Kenya.

i) Number of active members

From Table 4.11, that majority of the occupational pension's schemes members in service are less than 500 (50%), 11% of the respondents indicated that the members of their schemes were between 501 and 100 while 7% were between 1001 and 1500. The occupational

schemes having membership between 1501 and 2,000 were 11% while those having members of more than 2,000 were 20%. According to Kostyuk and Koverga (2006), the size of pension scheme has an influence on management structure, thus in our case the results of this study supports the previous study. Table 4.11 shows the distribution of membership among the respondents.

Table 4.11: Number of active members

Number of members in-service	Frequency	Percent	Valid Percent	Cumulative Percent
<500	63	50.0	50.0	50.0
500-1000	14	11.1	11.1	61.1
1001-1500	9	7.1	7.1	68.3
1501-2000	14	11.1	11.1	79.4
>2000	26	20.6	20.6	100.0
Total	126	100.0	100.0	

ii) Number of pensioners

Pensioners in a scheme are unique type of members given that they collect pensions and do not make contribution to the scheme. Kiragu (2010) observes that the pension's membership in a pension scheme brings a demand of proper governance so as to address their peculiar positions in the scheme. Table 4.12, shows that the majority of schemes have number of pensioners less than 500 (55%), and followed by those schemes between 500 and 1000 (22%). There are a few schemes from the sample having pensioners who are more than 1,000 cumulatively this category are 16% of the sample.

Table 4.12: Number of pensioners

Number of Pensioners	Frequency	Percent	Cumulative Percent
<500	69	55%	55%
500-1000	22	17%	72%
1001-1500	11	9%	81%
1501-2000	6	5%	86%
>2000	3	2%	88%
Total	15	12%	100%

iii) Value of Assets

According to Alexander Forbes Financial Consulting Actuaries Services (AFFCAS), the categories of schemes in terms of size are based on value of assets under management (AFFCAS, 2012). The AFFCAS report showed that the invested assets of the schemes participating in the Survey totaled KES171.8 billion, of which small schemes represented KES 1.0 billion (or 0.60%) of the assets under management, medium schemes represented Kenya Shilling 11.9 billion (or 6.95%) and large schemes KES 158.8 billion (or 92.45 %) of the assets under management.

Small scheme are pension schemes with assets values of less that Kenya shillings 100 million, medium assets of between Kenya shillings 100 million and Kenya shillings 500 million while large schemes have assets of value of at least Kenya shillings 500 million. The value of assets from the study is shown in Table 4.13.

Table 4.13: Value of assets

	Frequency	Percent	Cumulative Percent
<KES 1B	51	40.5	40.5
KES 1-5B	39	31.0	71.4
KES 5-10B	14	11.1	82.5
KES 10-15B	12	9.5	92.1
Over KES 15B	10	7.9	100.0
Total	126	100.0	

iv) Number of Sponsors

Sponsors of a scheme play a unique but indirect role in pension scheme management. Bull (2009) observes that the sponsor of a pension scheme being the creator of a scheme directs that structure of risk management. Table 4.14, shows that the majority of schemes have one sponsor (76%). The result also shows that 15% of the respondents had two sponsors, while 9% had more than two sponsors. This confirms the logical expectation since the target group was for occupational pension schemes and that the sponsors prefer to establish their unique pension schemes.

The findings also collaborates the results by Schaeffer (1998) who observed that the founders of an entity retains strategic management practices arising from its culture, thus a sponsor has a significant impact on the pension schemes. Table 4.24 shows a summary output of this study based on the frequency of sponsors.

Table 4.14: Number of sponsor frequency distribution

	Number of Sponsors	Frequency	Percent	Cumulative Percent
	1	96	76%	76%
	2	19	15%	91%
Valid	3	6	5%	96%
	4	2	2%	98%
	4>	3	2%	100%

4.5.5 Perception Pension scheme size and adoption of risk management

From Table 4.15, the study shows that 25% of the respondents believe that pension scheme size do not influence adoption of risk management. On the other hand 75% are either not sure or consider pension scheme size as a driver to adoption of pension scheme risk management adoption.

Table 4.15: Pension Scheme Size frequency distribution in percentage

	Strongly disagree	Disagree	Somehow agree	Agree	Strongly agree	Total
No. of Active Members	14.3	4.8	7.1	33.3	40.5	100
No. of Pensioners	24.6	5.6	18.3	22.2	29.4	100
Value of Assets	13.5	5.6	4.8	30.2	46	100
No. of Sponsors	26.2	5.6	15.9	12.7	39.7	100
Average	19.6	5.4	11.5	24.6	38.9	100

4.5.6 Reliability test pension scheme size constructs

A reliability analysis was conducted with all these four items used to measure the pension scheme size variable and the Cronbach's alpha value of 0.793 was obtained.

4.6.1 Statistical modeling using logistic regression - Pension Scheme Size/ Adoption of risk management strategies

Relationship adoption of RMS and pension scheme size – Scatter graph

This study sought to find out if the size of pension scheme influences the adoption of risk management strategies by pension schemes in Kenya. The hypothesis tested in the study is as follows:

Null Hypothesis (H_0): The size of pension scheme does not influence adoption of risk management strategies by pension schemes

Alternative Hypothesis (H_1): The size of pension scheme influences adoption of risk management strategies by pension schemes

A visual examination of the logistic scatter graph of the relationship between adoption of risk management strategies by pension schemes (Dependent Variable) and the Pension Scheme Size (Independent variable) shows that there is a high chance of adoption of risk management at the scheme grows in size. Figure 4.7 shows the logistic scatter graph with an estimated curve.

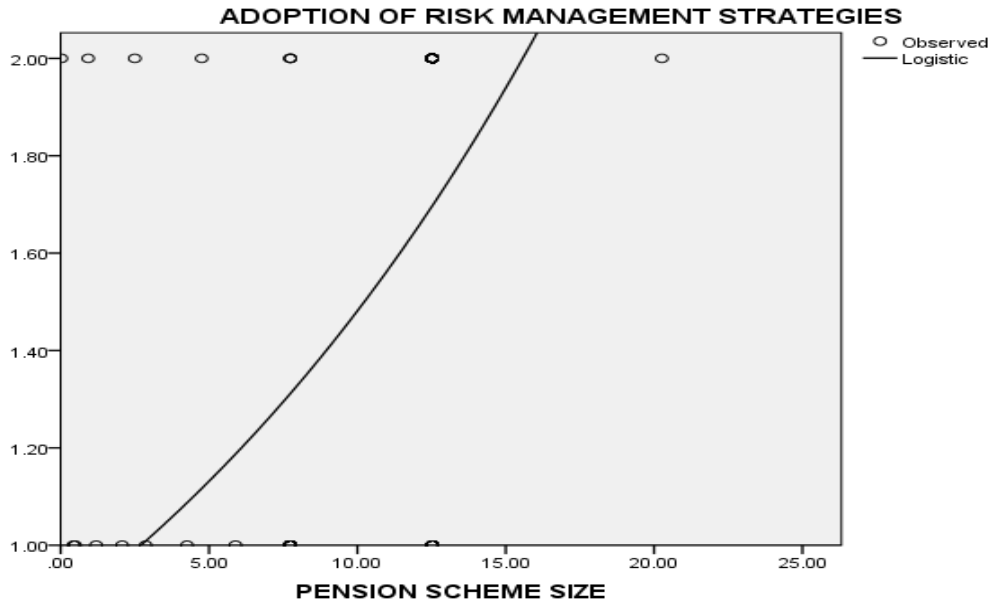


Figure 4.7: the scatter logistic curve estimation Adoption of RNS/Pension scheme Size

The model summary of the estimated logistic curve is as shown in Table 4.25.

Logistic regression model - adoption of risk management strategies and pension scheme size

One of the objectives of this study was to determine the influence of Pension scheme size on the adoption of risk management. A logistic regression output for the relationship is analyzed and presented in Tables 4.16 to 4. 18. From Table 4.5, classification when with the constant only is in the model was found to be 59.5%. Table 4.16 shows the logistic classification when the pension scheme size - independent variable (X_2) is included in the model holding all other independent variables constant. From Table 4.16 the results inclusive predictor variable pension scheme size shows that the prediction rises from 59.5% to 86.5%. This is a

significant improvement, implying that the predictive power of the model is better when the pension scheme size is included in the model.

Table 4.16: Classification Table

		Observed	predicted		Percentage correct
			Adoption of RMS	1.00	
step 1	Adoption of	1.00	40	11	78.4
	RMS	2.00	6	69	92.0
overall percentage					86.5

a. The cut value is .500

A check on the significance of the pension scheme size (X_2) as shown in Table 4.18 indicates that the variable has a significance of 0.000, which is less than 0.05 hence the variable is significant and thus if included to the model would add to the predictive power.

Table 4.18: Omnibus Tests of Model Coefficients Adoption of RMS/Pension Scheme Size

		Chi-square	df	Sig.
Step 1	Step	54.970	1	.000
	Block	54.970	1	.000
	Model	54.970	1	.000

With the addition of Pension Scheme Size variable to the model, the -2 log likelihood reduced by 54.97 with 1 degree of freedom. The p value for the result of adding pension scheme size variable to the model is given in the Table 4.18 as 0.000 which is less than the conventional significance level of 0.05. Therefore, it implies that an addition of pension scheme size to the model is statistically significant, that is this variable explains variations in

adoption of risk management strategies. The summary of the model and the variables in the equation is as shown in Table 4.19a and 4.19b respectively.

Table 4.27a: Likelihood test - Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	115.103 ^a	.354	.477

Table 4.27b Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	PENSIZE	.556	.096	33.338	1	.000	1.743
	Constant	-5.417	1.055	26.340	1	.000	.004

The model equation can be stated as follows:

$$\text{Logit (Y)} = -5.417 + 0.556X_2$$

The hypothesis tested:

Ho: Additional variable (X_2) does not improve the good fitting of the model

H₁: Additional variable (X_2) improves the model fitting

That is H₀: $\beta_2 = 0$ against the alternative hypothesis that

H₁: $\beta_2 \neq 0$

Hypothesis testing results using the Likelihood test statistic are as shown in Tables 4.19a and 4.19b in this study the hypothesis was:

H₀: $\beta_2 = 0$

H₁: $\beta_2 \neq 0$

Where β_2 is the co-efficient of the X_2 variable in the model:

$$\text{Logit (Y)} = -5.417 + 0.556X_1$$

The Likelihood test statistic is as shown in Table 4.19a. The value of -2LL when the constant alone is included is 170.074. The value for the model that includes the variable X_2 is 115.103. The Likelihood Ratio (LR) test statistic is $170.074 - 115.103 = 54.97$. The LR test statistic = 54.97 as compared with a chi square distribution value Table at 5% level of significance cut-off value from the Table of 3.84 shows that the LR test statistics is too large relative to the Table value. The results of this study as shown in Table 4.18 indicates that the pension scheme size variable (X_2) has a chi square value of 54.97 and a probability of $p = 0.000$ hence the model is significant. Therefore the null hypothesis is rejected and conclude that the model that includes the variable X_2 (pension scheme size) is better at predicting adoption of risk management strategies than the model with just the constant term.

The findings of this study concurs with the results of Hoyt and Liebenberg (2006) who found out that the size of an insurance company or pension scheme as measured by asset value plays a significant role in adoption of risk management strategy. The findings of this study are also collaborated by the findings of Pagach and Warr (2007) who found out that the size of an entity including the level of leverage increases the chance of adopting risk management such as hiring a risk officer.

4.6.3 Analysis of regulatory framework variable

The study sought to address the following objective:

Objective 3: To analyze the influence of the regulatory framework on the likelihood of adopting risk management strategies by pension schemes in Kenya

The results of this study on the influence of regulatory framework on the adoption of risk management are as summarized in Table 4.20. From Table 4.20, a significant number of trustees and administrators of pension schemes believe that regulatory framework has influence on adoption of risk management. This is reflected in the views of 85% of the respondents who either felt that regulatory framework has influence to a great extent or very great extent. This means that pension schemes trustees and administrators appreciate that regulatory frame work is the key driver to adoption of risk management.

Table 4.20: Regulatory framework results

Variable description		Frequency	Percent
Possess Investment Policy Statement (IPS)	No	12	9.5
	Yes	114	90.5
IPS approved by RBA	No	16	12.7
	Yes	110	87.3
Was IPS prepared with Assist of Qualified Person	No	4	3.2
	Yes	122	96.8
Scheme Investments Comply with IPS	No	13	10.3
	Yes	113	89.7
Service Level Agreement With Custodians	No	14	11.1
	Yes	112	88.9

Variable description		Frequency	Percent
Service Level Agreement With Fund Manager	No	14	11.1
	Yes	112	88.9
Service Level Agreement With Administrator	No	15	11.9
	Yes	111	88.1

4.6.1.1 Perception of Regulatory framework and adoption of risk management

The respondents were asked to give their perception on the influence of regulatory framework on adoption of risk management. Table 4.21 shows the results based on 12 constructs elements used to measure the regulatory framework variable. From Table 4.13, the respondents who felt that regulatory framework influence adoption of risk management to a very great extent were 55%, while 30% felt that regulatory framework influences to a great extent. Those who felt that it influences the adoption of risk management to a very low extent were 4%, low extent 2% while 9% were noncommittal on the extent of influence. The results are in conformity with the findings Hoyt and Liebenberg (2006) who they established that regulatory framework is a major driver to adoption of risk management.

Table 4.21: Regulatory Framework frequency distribution in percentage

Variable description	Very low extent	Low extent	Somehow	Great extent	Very great extent	Total
Govt Regulations	1	1	6	33	60	100
Reg. Investments	4.8	0	7.1	31.7	56.3	100
Custodian Trustee	4	10.3	21.4	38.1	26.2	100
Training Reg. Fund Manager	5.6	0	16.7	31	46.8	100
Reg. Administrator	4	7.1	1.6	28.6	58.7	100
Reg. IPS Advisor	4	0.8	8.7	30.2	56.3	100
Reg. External Auditors	4	0	12.7	37.3	46	100
Reg. BOT Chairman	4	0	0	23	73	100
Reg. Returns	8.7	0	3.2	32.5	55.6	100
Reg. AGM	4	0	9.5	15.9	70.6	100
Reg. Payments	4	1.6	14.3	25.4	54.8	100
Average	4	2	9	30	55	100

Reliability test Regulatory framework

Cronbach's alpha, using all the twelve items, was used to test the reliability of the regulatory framework variable and the value of 0.790 was obtained. Factor analysis based on communalities analysis was conducted with all the twelve items in the scale and the results shows that communalities extraction for all the twelve items range from 0.4 to 0.9 which is at least higher than the minimum of 0.4.

Statistical modeling using logistic regression analysis - Regulatory Framework/Adoption of Risk Management Strategies

i) Logistic Scatter plot

A visual examination of the logistic scatter graph between adoption of risk management strategies by pension schemes (Dependent Variable) and Regulatory Framework (Independent variable) shows that there is a positive relationship implying that there is a higher chance of adoption of risk management by pension schemes with increased. Figure 4.8 shows the logistic scatter graph with an estimated curve.

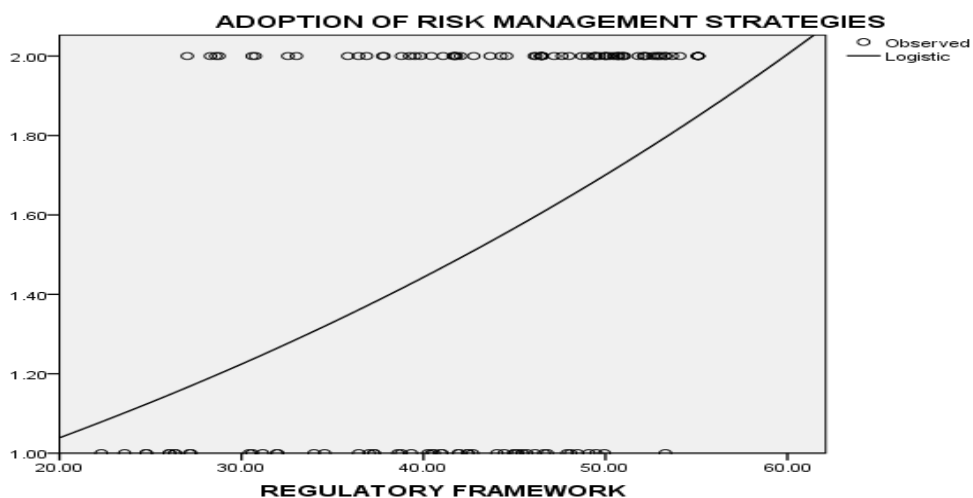


Figure 4.8: Logistic scatter plot – Adoption of RMS/Regulatory framework

ii) Logistic model

One of the objectives of this study was to determine the influence of Regulatory Framework on adoption of risk management strategies by occupational pension schemes. A logistic regression output from the analysis is presented in Tables 4.23 to 4.26. From Table 4.6, classification when we have the constant only in the model is 59.5%. Table 4.23 shows the logistic classification model when the Regulatory Framework (independent variable, X_3) is included in the model holding all other independent variables constant.

Table 4.23: Inclusion of regulatory framework in the model - Classification Table^a

			Predicted		
			Adoption of risk management strategies		Percentage correct
	Observed		1.00	2.00	
Step 1	Adoption of risk management strategies	1.00	23	28	45.1
		2.00	14	61	81.3
Overall percentage					66.7

a. The cut value is .500

From Table 4.23 the results inclusive regulatory framework (predictor variable, X_3) shows that the overall percentage of the classification is 66.7% compared to the constant only classification model (Table 4.6) overall percentage of 59.5%. This is a significant improvement, implying that the predictive power of the model is better when the regulatory framework is included in the model. The significance of the variable, regulatory framework (X_3) as shown in Table 4.24, $p=0.00$. Since $p < 0.05$, the model is significant.

Table 4.24: Omnibus tests of model coefficients

		Chi-square	df	Sig.
Step 1	Step	22.929	1	.000
	Block	22.929	1	.000
	Model	22.929	1	.000

In this study, adoption of risk management strategies by occupational pension schemes is our outcome of interest. From Table 4.25, the -2 log likelihood (-2LL) is 147.145. Checking at the significance as shown in Table 4.24, chi-square value of 22.929 has a $p = 0.000$ which is less than 0.05 hence the model is significant.

Table 4.25: Likelihood test - Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	147.145 ^a	.166	.225

a. . Estimation terminated at iteration number 4 because parameter estimates changed by less than .001

Table 4.26: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
step 1 ^a	Regulatory framework	.110	.025	18.791	1	.000	1.116
	Constant	-4.254	1.086	15.345	1	.000	.014

a. Variable(s) entered on step 1: REGULATORYFRAMEWORK.

The model equation is as follows:

$$\text{Logit (Y)} = -4.254 + 0.110X_3$$

In this study the Likelihood test statistic used to test the following hypotheses of the overall fit of the model.

H₀: The model is a good fitting model without X₃ variable

H₁: The model is not a good fitting model without X₃ variable

In this study the hypothesis tested for the variable is:

H₀: $\beta_3 = 0$

H₁: $\beta_3 \neq 0$

Where β_3 is the co-efficient of the variables in the model $Logit(Y) = -4.254 + 0.110X_3$

From Table 4.10b, the value of -2LL when just the constant is included is 147.145 + 22.929 = 170.074. The value for the model that includes the variable X₃ as shown in Table 4.25 is 147.145, therefore the Likelihood ratio test statistic is thus 170.074 – 147.145 = 22.929. The value of the Likelihood ratio (LR) test statistic = 22.929 is compared with the chi-square distribution Table value at 5% level of significance 3.84. LR test statistics is too large relative to the Table value, hence the null hypothesis is rejected and conclude that the model that includes the variable X₃ (Regulatory Framework is better at predicting adoption of risk management than the model with just the constant term.

The findings concur with those of Golshan and Rahid (2007) and PWC (2008) who in separate studies found out that the presence of the big four auditors and the pressure of regulations are major driver to adoption of risk management. The findings are also collaborated by the findings of KPMG (2006); McNulty and Florackis and Ormorod (2012) who found that the drivers to adopt risk management include the regulatory compliance requirement. Inferences can thus be made that the regulatory structure works to influence the adoption of risk management among the pension schemes.

4.6.4 Analysis of Portfolio Structure

Objective 4: To assess the influence of schemes' asset portfolio on the likelihood of adopting risk management strategies by pension schemes in Kenya.

The respondents were asked to indicate their perception of seven construct measures of portfolio structure based on a likert scale. As presented in Table 4.27, the study results shows that 23.2 % of the respondents believe to a low extent or very low extent that portfolio structure plays a role in adoption of risk management. On the other hand 63.5% either believed that they portfolio structure influences to adoption of risk management to a great extent or very great extent while 13.2% or were not too sure (somehow). The findings are in agreement with the results found by an earlier study by Halim, Miller and Dubpont (2010).

Table 4.27: Portfolio Structure - frequency distribution in percentage *

Variable description	Not at all	Low extent	Moderate extent	Great extent	Very Great extent	Total
Domestic Quoted Equity	6.3	6.3	8.7	35.7	42.9	100
Property	7.9	19.8	16.7	24.6	31	100
Unquoted Equity	19.8	2.4	14.3	34.1	29.4	100
Govt. Securities	2.4	19.8	11.9	38.1	27.8	100
Corp. Bonds and Comm. Paper	3.2	11.9	21.4	43.7	19.8	100
Term Deposits	6.3	18.3	12.7	43.7	19	100
Term Deposits	6.3	18.3	12.7	43.7	19	100
Offshore Investments	15.1	22.2	7.1	31.7	23.8	100
Average	8.41	14.88	13.19	36.91	26.59	100

4.1.1.1 Reliability test of portfolio structure

Cronbach's alpha, using all the variables eight items were used to test the reliability of the portfolio structure the value of 0.64 was obtained. The communality estimates of one construct, extent of portfolio influence, returned a factor value of 0.295, which is much lower than the minimum of 0.4. This indicates that the sub variable do not make a significant contribution towards measuring the factors hence the sub variable was dropped from the analysis. The other attribute factors range from 0.5 to 0.9 based on communalities analysis was conducted with all the eight items in the scale which are higher than the minimum of 0.4.

4.1.1.2 Logistic regression analysis - Portfolio structure and adoption of risk management strategies

One of the objectives of this study was to find out the Likelihood of adoption of risk management strategies by pension schemes as a result of its portfolio structure. A visual examination of the logistic scatter graph between adoption of risk management strategies by pension schemes (Dependent Variable) and Portfolio Structure (Independent variable, X_4) shows that there is a positive relationship implying that there is a higher chance of adoption of risk management by pension schemes with increased. Figure 4.9 shows the logistic scatter graph with an estimated logistic curve.

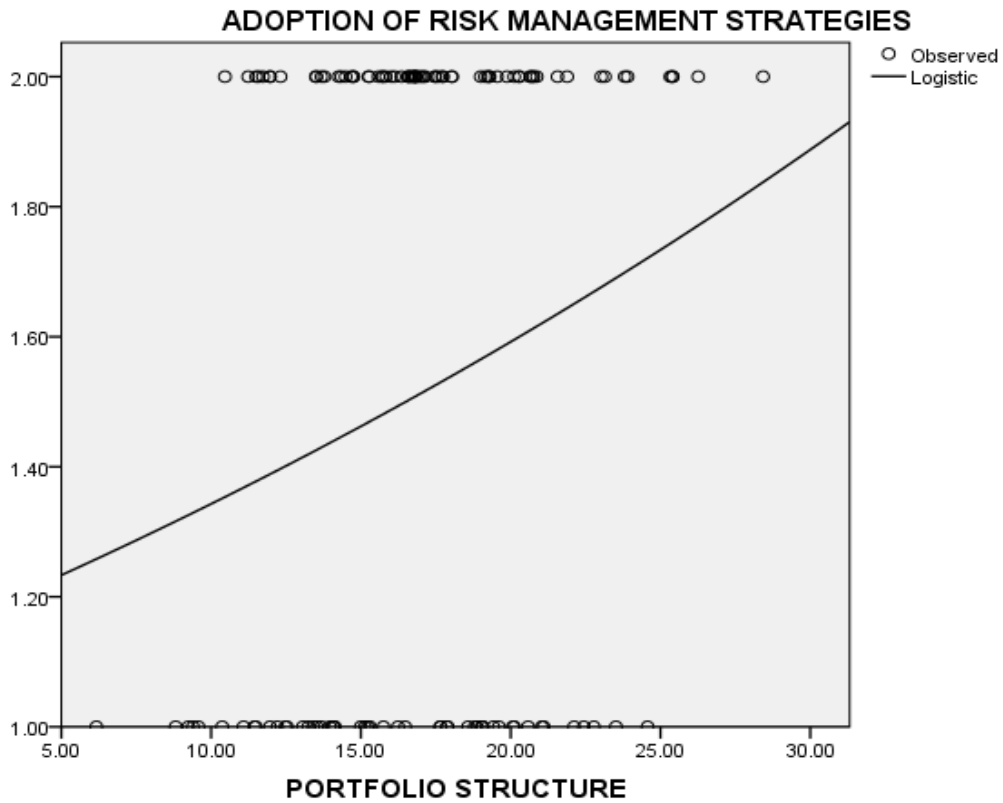


Figure 4.9: Logistic scatter plot – Adoption of RMS/Portfolio Structure

4.1.2 Logistic regression model - Adoption of risk management strategies and portfolio structure

In answering the research question on the influence of Portfolio structure on adoption of risk management strategies by occupational pension schemes, a logistic regression analysis was used. From Table 4.6, the classification when we have the constant only in the model is 59.5%. Table 4.29 shows the logistic classification model when the Portfolio Structure (independent variable, X_4) is included in the model holding all other independent variables constant showing classification of 64.3%. From Table 4.32 the results inclusive predictor variable portfolio structure (X_4) shows that the overall percentage of the classification is

64.3% compared to the constant only classification model (Table 4.6) overall percentage of 59.5%. This is a significant improvement, implying that the predictive power of the model is better when the portfolio structure variable (X_4) is included in the model. The significance of the variable, X_4 as shown in Table 4.32 is $p=0.020$. Since $p < 0.05$, thus the model including X_4 was found to be significant

Table 4.29: Inclusion of Portfolio Structure in the model - Classification Table^a

Observed		Predicted		Percentage Correct
		Adoption of risk management strategies		
Step	Adoption of risk management strategies	1.	2.	
1	1.	14	37	27.5
	2.	8	67	89.3
Overall Percentage				64.3

a. The cut value is .500

The Likelihood ratio test (LR) is used to test hypothesis. From Table 4.30, the -2 log likelihood (-2LL) is 164.652

Table 4.30: Likelihood Test - Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	164.652 ^a	.042	.057

Table 4.31 on page 137, shows the logistic model output model when the variable X_3 is included:

Table 4.31: Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	PORTF	.107	.048	5.073	1	.024	1.113
	Constant	-1.407	.810	3.022	1	.082	.245

a. Variable(s) entered on step 1: PORTF.

The model equation is as follows:

$$\text{Logit}(Y) = -1.407 + 0.107X_4$$

In this study the Likelihood test statistic used to test the following hypotheses of the overall fit of the model.

H_0 : The model is a good fitting model without X_4 variable

H_1 : The model is not a good fitting model without X_4 variable

Table 4.32: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	5.422	1	.020
	Block	5.422	1	.020
	Model	5.422	1	.020

The hypothesis tested was:

H_0 : $\beta_4 = 0$

H_1 : $\beta_4 \neq 0$

Where β_4 is the co-efficient of the portfolio structure variable in the model:

$$\text{Logit}(Y) = -1.407 + 0.107X_4$$

From Table 4.30, the value of -2LL for the model that includes the variable X_4 is 164.652. The Likelihood Ratio test statistic is thus 5.422. The value of the Likelihood Ratio (LR) test statistic = 5.422 when compared with the chi-square distribution Table value at 5% level of significance of 3.84 show that LR test statistics is too large relative to the Table value. Therefore, the null hypothesis is rejected and make the conclusion that the model that includes the variable X_4 (Portfolio Structure) is better at predicting adoption of risk management than the model with just the constant term. Checking at the significance as shown in Table 4.32, chi-square value of 5.422 has a $p = 0.020$ which is less than 0.05 hence the model is significant.

The findings concurs with those of Halim and Miller and Dupont (2010) who found out that organizations adopt risk management through controlling tracking error and investment beliefs driven by the portfolio of investments. Therefore the wider portfolio structure of a pension scheme increases the chances of adopting risk management.

4.6.5 Analysis of pension administration structure variable

The study sought as Objective 5: To find out the influence of pension schemes administrative structure on the possibility of adopting risk management strategies by pension schemes in Kenya

In this study the influence of pension scheme administration structure on adoption of risk management was tested by asking respondents to indicate their perception in a likert scale. The survey results as shown in Table 4.33 indicates that 88.1% of the respondents, believe that pension scheme administration impacts adoption of risk management by pension schemes. Only 3.3% are of the opinion that it has influence to a low extent and very low extent, while 10.6 % indicated that it somehow affect adoption of risk management. This

means that Trustees and administrators would consider efficient administration structure for adoption of risk management.

Table 4.33: Pension Administration Structure- frequency distribution in percentage

Variable measure	Very low extent	Low extent	Moderate extent	High extent	Very High extent	Total
Qualification	0	0	0	43.7	56.3	100
No Staff	9.5	7.9	21.4	34.9	26.2	100
Operational Efficiency	0	0	10.3	41.3	48.4	100
Processes & Operation	0	2.4	7.9	35.7	54	100
Nature of MIS	0	0	21.4	39.7	38.9	100
Transparent & Accountable Management style	0	0	2.4	30.2	67.5	100
Average	1.58	1.72	10.57	37.58	48.55	100

4.6.5.1 Reliability test of pensions administration structure

Reliability of the constructs measures were tested using Cronbach's alpha. All the six items of measure of pension scheme administration were used to test the reliability of the pension's administration structure variable and cronbach's alpha value of 0.890 was obtained. Factor analysis based on communalities analysis was conducted with all the six items in the scale and the results shows that communalities extraction for all the twelve items range from 0.4 to 0.9 which is at least higher than the minimum of 0.4.

4.6.5.2 Statistical modeling using logistic regression model - Adoption of risk management strategies and Pension Scheme Administration

An analysis of the influence of administration of a pension scheme in driving the adoption of risk management by pension schemes was analyzed. The logistic scatter graph between

adoption of risk management strategies by pension schemes (Dependent Variable) and Pension Scheme Administration (Independent variable, X_5) showed that there exists a positive relationship of pension scheme administration and adoption of risk management. Thus implies that there is a higher chance of adoption of risk management by pension schemes with increased pension scheme administration. Figure 4.10 shows the logistic scatter graph with an estimated logistic curve.

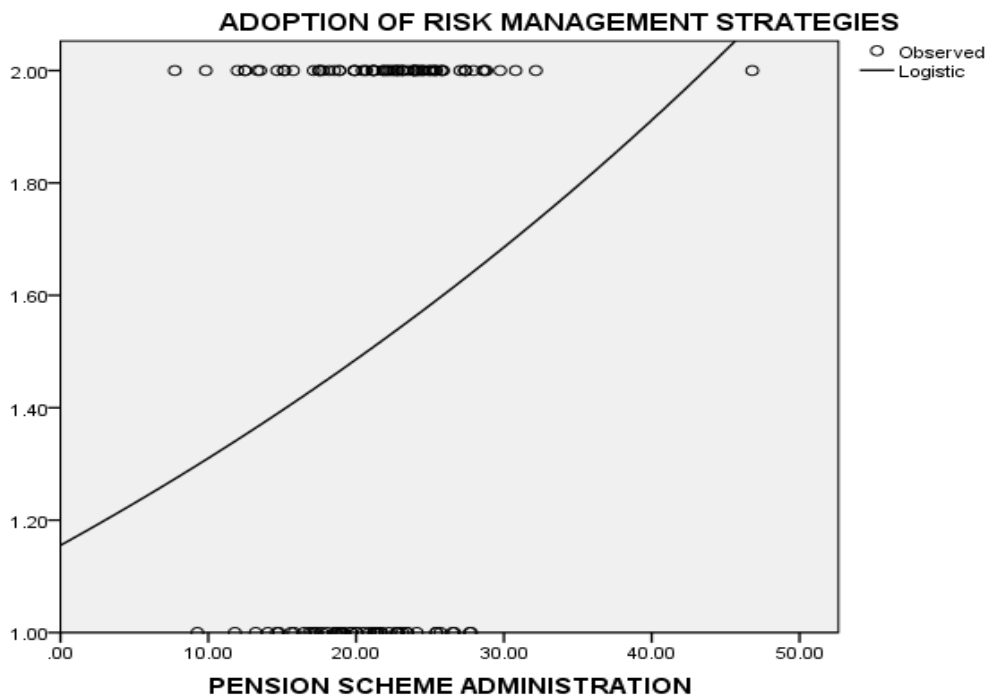


Figure 4.10: Logistic scatter plot – Adoption of RMS/ Scheme Administration

Logistic regression model - Adoption of risk management strategies and pension scheme administration

One of the objectives of this study was to determine the influence of Pension Scheme Administration Structure and Adoption of Risk Management Strategies by occupational pension schemes. A logistic regression analysis model was used ascertain the relationship. The outputs of the logistic analysis are shown in Tables 4.35 to 4.38. From Table 4.6, the classification when we have the constant only in the model is 59.5%. Table 4.35 shows the

logistic classification model when Pension Scheme Administration Structure variable (independent variable, X_5) is included in the model holding all other independent variables constant.

Table 4.35: Pension Administration Structure in the model – Classification Table^a

Observed		Predicted			
		Adoption of RMS		percentage correct	
		1.00	2.00		
step	Adoption of risk RMS	1.00	8	43	15.7
1		2.00	11	64	85.3
overall percentage					59.9

a. The cut value is .500

From Table 4.35 the results inclusive predictor variable pension administration structure shows that the overall percentage of the classification is 59.9% compared to the constant only classification model (Table 4.6) overall percentage of 59.5%. This is a better though not much significant classification than when it was the constant alone, implying that the predictive power of the model is does not improve much with pension scheme administration variable (X_5) in the model. However, the significance of the variable, X_5 as shown in Table 4.36 is $p=0.027$. Since $p < 0.05$, thus conclude that the model is significant.

Table 4.36: Omnibus tests of model coefficients

Step		Chi-square	Df	Sig.
Step 1	Step	4.866	1	.027
	Block	4.866	1	.027
	Model	4.866	1	.027

In this study, the Likelihood ratio test (LR) is used to test hypothesis. From Table 4.37, the -2 log likelihood (-2LL) is 165.208

Table 4.37: Likelihood test - model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	165.208 ^a	.038	.051

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 4.38 shows the output model when the variable X_5 is included:

Table 4.38: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Pension scheme administration	.082	.039	4.439	1	.035	1.086
	Constant	-1.350	.837	2.600	1	.107	.259

a. Variable(s) entered on step 1: PENSION SCHEME ADMINISTRATION

The model equation is as follows:

$$\text{Logit. (Y)} = -1.350 + 0.082X_5$$

In this study the Likelihood test statistic used to test the following hypotheses of the overall fit of the model which includes pensions administration structure.

H_0 : The model is a good fitting model without X_5 variable

H_1 : The model is not a good fitting model without X_5 variable

The hypothesis tested was:

H_0 : $\beta_5 = 0$

H_1 : $\beta_5 \neq 0$

Where β_5 is the co-efficient of the portfolio structure variable in the model:

From Table 4.37 the value of -2LL for the model that includes the variable X_5 is 165.208. The Likelihood Ratio test statistic chi square from Table 4.36 is 4.866. This value of the Likelihood ratio (LR) test statistic, 4.866, when compared with the chi-square distribution Table value at 5% level of significance of 3.84 showed that LR test statistics is greater than the Table value. Therefore, the null hypothesis is rejected and conclude that the model that includes the variable X_5 (Pension Scheme Administration) is better at predicting adoption of risk management than the model with just the constant term. Checking at the significance as shown in Table 4.36, chi-square value of 4.866 has a $p = 0.027$ which is less than 0.05 hence the model is significant.

The findings correspond with the findings of Tariki and Georgers (2011) who found out that the risk management philosophy adopted by a pension scheme is dependent on management risk aversion of the pension scheme administration. It can therefore be inferred from the results that a wider scope in pension scheme administrative structure increases the chances of adoption of risk management.

4.7 Overall logistic regression model

The Likelihood of Adoption of risk management strategies and board of trustees composition, pension schemes size, regulatory framework, portfolio structure and pension scheme administration

Entering all variables at the same time

The results with only the constant included before any coefficients of the independent variables are entered into the equation are presented under Block 0, Beginning block. The model is compared with a model including all the predictors (BOT Composition, Pension Scheme Size, Regulatory Framework, Portfolio Structure and Pension Administration

Structure) to determine whether the later model is more appropriate. In this study the approach of entering all variables at the same time is taken as suggested by (Chuang, 1997).

Classification model

The results as shown in the classification Table, Table 4.6 indicates a classification rate of 59.7%. This implies that if without the knowledge about the variables and guessed that an occupational pension scheme would not adopt risk management strategies we would be correct 59.7% of the time. The classification model after inclusion of the five independent variables shows that the model overall percentage improves from 59.5% to 89.1% as shown in Table 4.39.

Table 4.39: Classification Table after inclusion of independent variables

Observed		predicted		Percentage correct	
		Adoption of RMS	Adoption of RMS		
		Not adopted RMS	Adopted RMS		
step 1	Adoption of RMS	not adopted RMS	65	14	94.9
		adopted RMS	34	13	64.3
Overall percentage					89.1

From Table 4.40, the results shows that all the variables except, Board of trustees Composition, have a significance value of less than 0.05 hence they are significant and thus if included to the model would add to the predictive power of the model.

Table 4.40: Contribution of independent variables in the model equation

			Score	Sig.
Step 0	Variables	Pensions administration structure	12.618	.002
		Portfolio structure	6.01	.009
		Regulatory framework	3.532	.033
		Pension scheme size	2.033	.044
		Board of trustees composition	.743	.081
	Overall statistics		16.730	.012

It is noteworthy that the independent variable Board of trustee's composition is significant at 10% significance level but not significant at 5% significance level.

Overall logistic model

In a logistic model, Exp. (B), gives the relative odds or odds ratio for a particular explanatory variable, given the other explanatory variables in the model (Cohen, 2003). From the overall logistic regression model in this study, as shown in Table 4.41, the results indicate that Exp (B) for pension scheme administration is the highest with 58.32. This implies that each unit of pension administration structure change will lead to 58.32 times more likely for an occupational pension schemes to increase the chance of adopting risk management strategies. From Table 4.41 all the variable composition except Board of Trustees Composition (BTC) has a significance less than 0.05 hence the variables are significant and thus if included to the model would add to the predictive power of adoption of risk management.

Table 4.41: Variables in the equation

Variable		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1	Pensions administration structure	4.066	0.841	70.592	1	.008	58.32
	Portfolio structure	3.004	0.648	21.491	1	.031	20.17
	Regulatory framework	2.010	0.527	14.547	1	.036	7.46
	Pension scheme size	1.008	0.062	0.017	1	.048	2.74
	Board of trustees composition	.004	0.046	0.000	1	.081	1.04
	Constant	0.181	1.439	0.016	1	.012	1.20

a. Variable(s) entered on step 1: PEN. ADMIN., PORTFOLIO.STRUCTURE, REGULATORUYFRAMEWORK, PENSIOS CHEME SIZE, BTC.

The overall models leads to readjustment on the degree of influence for each variable beginning in order of variable with the highest influence as measured by logistic coefficient are: Pension Scheme Administration (X₁); Portfolio structure (X₂); Regulatory Framework (X₃); Pension scheme size (X₂) and Board of Trustees Composition (X₅) in that order. All the variables are statistically significant (p<0.05) . The p value for Board of Trustees Composition (X₅) in the model as shown in Table 4.39 is 0.389 which is non-significant since it is greater than the conventional significance level of 0.05 (sig = 0.389 > 0.05). In other words this variable when combined with X₂, X₃, X₄ and X₅ does not explain variations in adoption of risk management strategies by occupational pension schemes in Kenya.

From Table 4.43 the estimated logistic regression model is:

$$\text{Logit (Adoption of RMS)} = 0.181 + 4.066X_1 + 3.004X_2 + 2.010X_3 + 1.008X_4 + 0.01X_5.$$

Probability of a case = _____

Likelihood ratio test - testing the significance of the model with all the independent variables

A logistic model is said to provide a better fit to the data if it demonstrates an improvement over the intercept-only model (Cohen, 2003). The -2LL (deviance) has a chi squared distribution, thus the overall significance is tested using the Chi square derived from the likelihood of observing the actual data under the assumption that the model that has been fitted is accurate (Chuang, 1997). In this study, adoption of risk management strategies by occupational pension schemes is our outcome of interest. From Table 4.42, the -2 log likelihood (-2LL) was found to be 42.665.

Table 4.42: Model summary

Model Summary			
Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	42.665 ^a	.521	0.691

Hypotheses

The hypotheses tested in relation to the overall fit of the model is whether inclusion of an explanatory variables in the model tells us more about the outcome than a constant only model (that does not include the variables).

Model 1: $\text{logit}(p) = \beta_0 + 0X_1 = 0.181$

Model 2: $\text{logit}(p) = 0.181 + 4.066X_1 + 3.004X_2 + 2.010X_3 + 1.008X_4 + 0.01X_5$.

Model 1 is nested within Model 2 that is it includes the constant in model and the independent variable X1. (X1) are included in Model 2. The interest is in whether the additional explanatory variables in Model 2 (X1, X2, X3, X4, X5) is required, that is does the simpler model (Model 1) fit the data just as well as the fuller model (Model 2).

The hypothesis tested:

Ho: Additional variables does not improve the good fitting of the model

H1 : Additional variable improve the model fitting

That is: H0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ against the alternative hypothesis that

H1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

Hypothesis testing results using the Likelihood test statistic are as shown in Tables 4.43a and 4.43b

4.43 a: Tests output Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	13.811	5	.017
	Block	13.811	5	.017
	Model	13.811	5	.017

The Likelihood Ratio test statistic is $45.876 - 13.811 = 13.811$. The results of this study as depicted in Table 4.43a indicates that the model chi square has a value of 13.811 and a probability of $p = 0.017$. Comparing the logistic regression statistic 13.811 with a chi square distribution value Table at 5% level of significance, the cut-off value from the Table is 3.84. LR test statistics is too large relative to the Table value, hence the null hypothesis is rejected and conclude that the model that includes the variable X_1, X_2, X_3, X_4 , and X_5 is better at predicting adoption of risk management than the model with just the constant term alone.

Table 4.43b Likelihood test - comparisons of models

Model	- 2log Like hood
Model 1 (constant Only)	45.876 i.e. (42.665 + 13.811)
Model 2 (With X_1, X_2, X_3, X_4 and X_5)	42.665

Test of the overall fit of the Logistic Regression Model

Cox and Snell's R^2 test

Cox and Snell's R^2 is an attempt to measure the association but its maximum is less than 1, hence making it difficult to interpret. The output from SPSS for the two statistics in the Model Summary Table 4.42 appendix V, gives the Cox and Snell R^2 as 0.521. The interpretation is that the model explains about 52.1% of the variation in the data. However, there is no formal test that can tell us if 52.1 % is sufficient or not.

Nagelkerke's R² (or adjusted R²) test

Nagelkerke's R² divides Cox and Snell's R² by its maximum in order to achieve a measure that ranges from 0 to 1. From Table 4.42, Nagelkerke's R² is 0.691, indicating a moderately strong relationship of 69.1% between the predictors and the prediction (Nagelkerke's, 1991) . According to Peng and So (2002), logistic R² measures are not measures of goodness of fit but rather an attempt to measure the strength of the association.

The Hosmer - Lemeshow (H-L) Goodness-of-Fit Test

A test of the overall fit of a model to the observed data that can be used is the Hosmer and Lemeshow (H-L) test (Hosmer & Lemeshow, 2000). The idea is to form groups of cases and construct a "goodness-of-fit" statistic by comparing the observed and predicted number of events in each group; the cases are divided into a number of approximately equal groups based on values of the predicted probability such that the differences between the observed number and expected number (calculated by summing predicted probabilities based on the model) in each group are then assessed using a chi-square test (Hosmer & Lemeshow, 2000).

If the H-L goodness-of-fit test statistic is greater than .05, as we want for well-fitting models, we fail to reject the null hypothesis that there is no difference between observed and model-predicted values, implying that the model's estimates fit the data at an acceptable level. Well-fitting models show non-significance on the H-L goodness-of-fit test. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed.

Hypothesis:

Ho: There is no difference between the observed and predicted values

H1: There is a difference between the observed and predicted values

Table 4.44a: Hosmer and Lemeshow Test and contingency Table

Step	Chi-square	df	Sig.
1	11.407	8	.037

The value H – L test statistic is 11.407 which when compared to the cut-off value from the chi-square distribution with 8 (number of groups i.e. 10 – 2) degrees of freedom. The p-value as shown in Table 4.45 is 0.037, which is greater than 0.05, therefore the null hypothesis is rejected that there is no difference between the observed and predicted values, and conclude that the model has a difference.

Wald statistic test

From Table (Table 4.41), the Wald statistic provides an index of the significance of each predictor in the equation. The Wald statistic has a chi-square distribution, and to assess Wald statistic, we take the significance values and if less than .05 reject the null hypothesis as the variable does make a significant contribution. In this study, we note that four variables; Pension Scheme Administration, Portfolio Structure, Regulatory Framework and Pension Scheme size all have p values implying that they contributed significantly to the prediction but Board of trustees composition did not ($p = .081$).

The findings are concurs with the study findings of Kleffner, Lee and McGannon (2003); Daud and Yazid (2010) who found out that the governance regulatory pressure, administration concern, structure of boards and the size of an entity plays a significant t role in adoption of risk management. It can therefore be inferred a positive change in the five variables combined will lead to increased chance of adopting risk management.

4.8 Optimal Model

From the research finding of this study as tabulated above, the model as stated in chapter 3 can now be modified in line with the established results as shown in Table 4.41 variable in the equation.

$$\text{Logit (Adoption of RMS)} = 0.181 + 4.066X_1 + 3.004X_2 + 2.010X_3 + 1.008X_4 + 0.01X_5.$$

$$\text{Probability of a case} = \frac{\text{e}^{\text{Logit (Adoption of RMS)}}}{1 + \text{e}^{\text{Logit (Adoption of RMS)}}}$$

The relationship optimal conceptual model thus is as shown in Figure 4.10. The new adjusted model is a realignment arising from the degree of influence for each variable as shown in Table 4.41: Pension Scheme Administration (X1); Portfolio structure (X2); Regulatory Framework (X3); Pension scheme size (X2) and Board of Trustees Composition (X5) in that order. The revised optimal model of this study is as shown in Figure 4.11 in page 153.

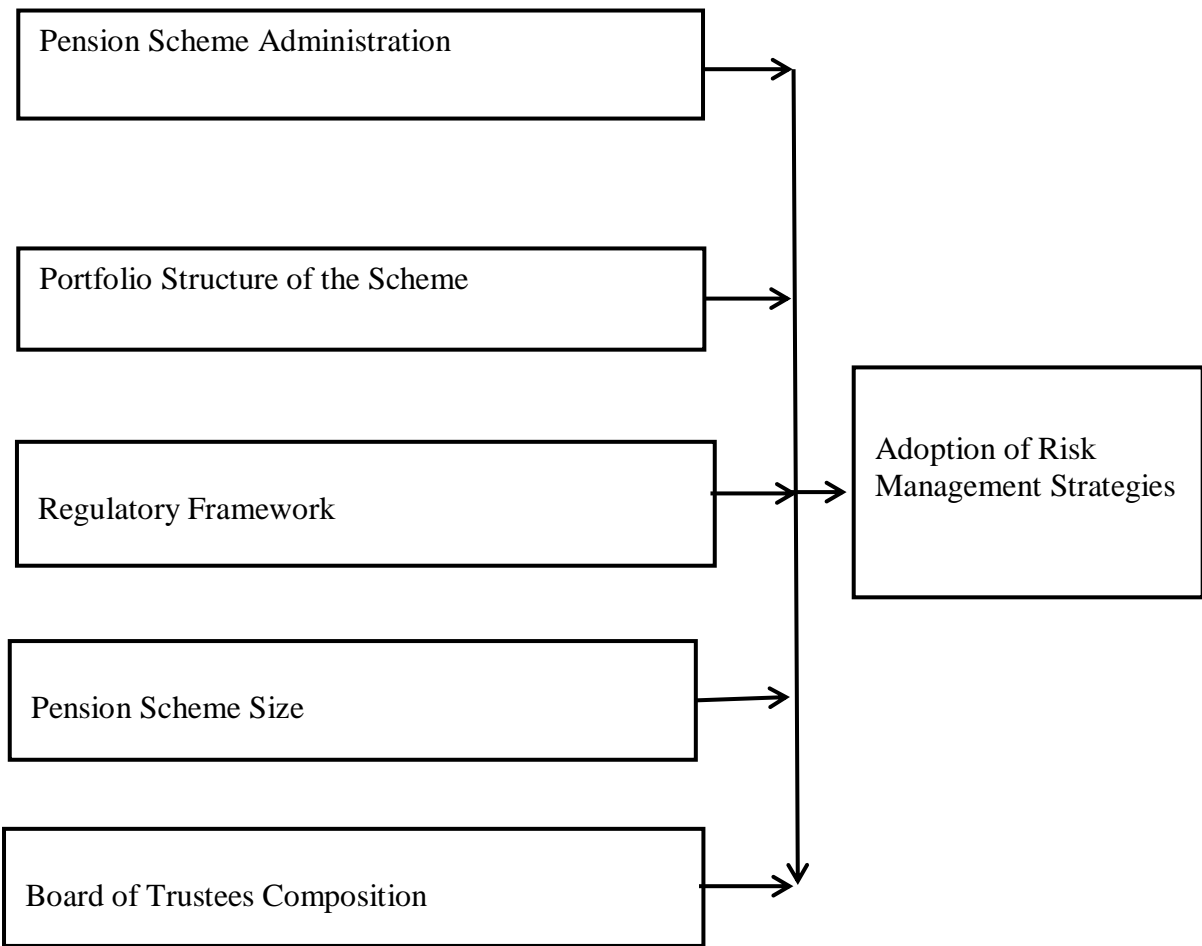


Figure 4.11: Revised optimal study model

Source: Developed from the analysis of data

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this last chapter the most important aspects of our research is highlighted the determinants of the Likelihood of adopting risk management of pension schemes. First, we focus on summary of the findings and hypothesis confirmation as derived from this thesis by referring to our research proposition. Furthermore, policy and further study recommendations which should be of interest to both academics and practitioners are covered. In this section also is a presentation of the interpretation of the analysis upon which conclusions in relations to the research objectives were drawn.

5.2 Summary of the findings

A review of the empirical studies examining the influence of adoption of risk management strategies by occupational pension schemes found that previous studies have not produced conclusive evidence to prove the drivers of adoption of risk management and the degree of their influence. Detailed examination of the literature suggested that only a few studies have examined the relationship between adoption of risk management strategies in the corporate sector and in developed countries such the UK, and the pension industry is largely ignored and yet it is the backbone of economic development in developing countries such as Kenya. The pensions assets in Kenya is about 20% of Kenya's Gross Domestic Product and in the recent past some pensions schemes have been collapsing leading to losses or delay of members benefits. The literature review was helpful in identifying prominent gaps in the literature.

The study started by targeting a population of 1,216 occupational pensions' schemes in Kenya registered with the Kenya Retirement Benefits Authority. The sampling procedure used for this study was a stratified random sampling with the stratus determined by the type of pension schemes; Defined Contribution schemes or Defined Benefits Schemes. The study unit of analysis was the pension schemes. A stratified random sample of 192 pensions schemes with respondent in each being either a Trustee or Pensions Administrator or Principal Officer or Pension Officer was selected. The responses were 126 respondents (a response rate of 77%).

Reliability measure used was the Cronbach's coefficient alpha. The study instruments were pilot tested and analyzed the results had acceptable levels of Cronbach's alpha with a minimum acceptable cutoff point of 0.7 to test reliability and construct of the variables. The statistical tool applied in this study was the Statistical package for social sciences (SPSS) version 19. Factor analysis and use of principal components analysis led to reduction of sub variables with those having Engel value of at least one were being retained. The response of the dependent variable were dichotomous, hence the appropriate model of analysis applied was Logistic Regression Model.

Data were analyzed using descriptive statistics. Logistic scatter plots from curve estimation were visually examined to see the nature of logistic regression relationship. Logistic Binary statistical analysis for each variable was undertaken and logistic tests of model fit were undertaken using; classification model, Wald test of variable, The Hosmer-Lemeshow (H-L) Goodness-of-Fit Test, Cox and Snell's R^2 , and Nagelkerke's R^2 (or adjusted R^2).

5.3 The overall effect of the study findings

The findings of this study indicate that the variables have a significant impact on influencing the Likelihood of adoption of risk management strategies by occupational pension schemes. The hypotheses presented in chapter 1 were tested using logistic regression model various as explained in chapter 3. To aid the discussion of the results of this study, the findings are presented in order of the research questions.

5.3.1 The likelihood that the composition of Board of Trustees' influences adoption of risk management strategies by pension schemes in Kenya

As indicated in chapter 4, direct logistic regression was performed to examine whether Board of trustee's composition (Predictor variable) leads to adopting risk management strategies by occupational pension schemes. The model containing the predictor variable was statistically significant and having an improved classification from 59.5% to 61.9% thus indicating that the model was able to distinguish, though marginally, between having the Board of trustee's composition variable and not having it. The findings of this study show that the Board of trustee's composition makes a statistically significant contribution to the model, recording an odds ratio of 1.099. The B value is positive (0.095) indicating that when Board of trustees' composition increases the probability of adoption of risk management by pension schemes increases. The findings of this analysis indicate that placing much emphasize on occupational pensions schemes' Board of trustees composition is likely to have adoption of risk management strategies. The extent to which raising a unit measure change of Board of trustee's composition influences since the odds ratio value, $EXP(B)$ is positive ($EXP(B) = 1.099$). Hence when Board of trustees is raised by one unit, given that the odds ratio $EXP(B) = 1.099$, occupational pension's schemes are 1.099 times more likely to adopt risk management strategies.

5.3.2 The size of a pension scheme and its influence the likelihood of adopting risk management strategies in Kenya

Logistic regression analysis was performed to examine whether pension scheme size (Predictor variable) influences adoption risk management strategies by occupational pension schemes. The results showed that model containing the predictor variable was statistically significant and improved classification from 59.5% (with constant only) to 86.9% thus indicating that the model was able to distinguish significantly between having pension scheme size variable and not having it. The results show that the pension's scheme size makes a statistically significant contribution to the model and recorded an odds ratio of xxx. The B value is positive (0.556) indicating that when pensions scheme size increases the probability of adoption of risk management by pension schemes increases. The findings of this analysis indicate that placing much emphasize on occupational pensions schemes' pensions scheme size is likely to have adoption of risk management strategies. The extent to which raising a unit measure change of pension scheme size influences since the odds ratio value, $EXP(B)$ is positive, $EXP(B) = 1.743$. Hence when pension scheme size is increased by one unit, given that the odds ratio $EXP(B) = 1.743$, occupational pension's schemes are 1.743 times more likely to adopt risk management strategies.

5.3.3 The influence of regulatory framework has on probability of adopting risk management strategies in the pension scheme sector in Kenya

Arising from the third objective of this research which focused on the influence of regulatory framework (independent variable) on adoption of risk management strategies, a logistic regression was run for the independent variable. The results showed that the model that contains the independent variable was statistically significant and improved classification from 59.5% (with constant only) to 61.9% thus indicating that the model was able to

distinguish between having Regulatory Framework variable and not having it. The results show that the Regulatory Framework makes a statistically significant contribution to the model and recorded an odds ratio of 1.116. The B value is positive (0.11) indicating that when regulatory framework increases the probability of adoption of risk management by pension schemes increases. The findings of this analysis indicate that placing much emphasizes on regulations of occupational pensions schemes' is likely to have adoption of risk management strategies.

5.3.4 The chances that portfolio structure of a pension scheme influence likelihood adoption of risk management strategies by pension schemes in Kenya

A logistic regression analysis was also run for the fourth objective, to find out the influence of portfolio structure (independent variable) on adoption of risk management strategies, with a view of testing the aforementioned research question. The results showed that the model that contains portfolio structure variable was statistically significant. A test of the classification of the model showed an improvement from 59.5% (with constant only) to 61.9% thus indicating that the model was able to distinguish between having portfolio structure variable and not having it. The coefficient B value is positive (0.11) indicating that when portfolio structure is emphasized and a balance in portfolio selection is increased, the probability of adoption of risk management by pension schemes increases.

5.3.5 The Likelihood that the administration structure influences adoption of risk management strategies by pension schemes in Kenya

The fifth objective of this study was to find out the influence of pension scheme administration (independent variable) on adoption of risk management strategies, with a view of testing the aforementioned research question. The results showed that the model that

contains pension scheme administration variable was statistically significant. A test of the classification of the model showed an improvement from 59.5% (with constant only) to 61.9% thus indicating that the model was able to distinguish between having portfolio structure variable and not having it. The coefficient B value is positive (0.11) indicating that when portfolio structure is emphasized and a balance in portfolio selection is increased, the probability of adoption of risk management by pension schemes increases.

5.3.6 The overall effect of all the independent variables to the adoption of risk management strategies by pension schemes

The research findings showed a positive influence of all the five variables to adoption of RMS. Nagelkerke's R^2 is 0.691, indicating a moderately strong relationship of 69.1% between the predictors and the prediction. The Hosmer and Lemeshow (H-L) value of the research is 11.95, implying that the model increases the like-hood of adoption of risk management when all the variables are included. However, the tests were carried out at 0.05 significance and Board of trustees composition fell in the rejection area and thus was omitted in the optimal model of this study.

5.4 Conclusion

The bottom line of this study was to explore the determinants influencing adoption of risk management adoption by pension schemes in Kenya. Based on previous studies, the hypotheses on the elements expected to determine the Likelihood of adoption were expected to have a positive relation such that a unit increase in one of the variable will lead to an increase in probability of adoption. The conclusion arising from each of the variables are as follows.

5.4.1 Board of trustees' composition

The research found out that Board of trustees' composition has an influence on increasing the likelihood of adopting risk management. The odds ratio of 1.099 implied that a unit change in BOT composition leads to 1.099 more likely for adoption of risk management. Policy makers can use this in enhancing trustees' composition and governance as a way of enhancing risks management and consequently higher returns for pension schemes.

5.4.2. Pension scheme size

The size of a pension schemes influences the likelihood of adopting risk management. Tests of the findings led to the rejection of the null hypothesis and conclude that size of pension schemes influences the likelihood of adopting risk management by pension schemes. It has a higher chance of enhancing likelihood of adoption than the Board of trustee's composition. Matching of pension schemes' to increase size could lead to increased likelihood of adoption of risk management strategies and consequently better performance.

5.4.3 Regulatory framework

Regulatory framework influences the likelihood of adopting risk management. Classification in the model increased from 59.5% to 86% when regulatory frame work was included in the model. The odds ratio was 1.7 implying a significant influence on improving adoption of risk management.

5.4.4 Portfolio structure

A test of the classification of the model showed an improvement from 59.5% (with constant only) to 61.9% thus indicating that the model was able to distinguish between having portfolio structure variable and not having it. Portfolio structure influences the Likelihood of

adopting risk management. A diversified portfolio and opening up of investment classes will lead to improvement in adoption of risk management strategies

5.4.5 Pension Administration structure

Pension Scheme Administration structure influences the Likelihood of adopting risk management. From the study it was established that when all the variables are considered together, pension administration structure had the biggest influence in adoption of risk management. It implies then that policy makers need to put more weight on administration of pension schemes.

5.5 Recommendations

In reviewing both the literature and the results in this study conclusions were drawn and can work toward value additions in the pensions industry. To the pension industry stakeholders particularly the government should be take cue from the finding that whereas composition of board of trustees has impact in the likelihood of adopting risk management, it is to a lower degree of probability than administration structure among the pension schemes and thus more focus should be should be on the structure of pension schemes. It is also worth noting that the results of this study can be used by policy makers in building social security models that can withstand test of time in terms of risk management.

The unique contribution from this study is first of all the scope of examination. Analysis of data for the variables, using Logistic Modeling which has not been widely used in Strategic Management Research and finance brings a new dimension of probabilistic analysis. This study makes an important contribution to the literature by validating the findings of some of the previous studies conducted in other geographical regions (developed countries) and corporate sectors. By examining these key concepts within the Kenyan context, this study is

making a significant contribution because it is extending the industry and region borders. The findings relating to adoption of risk management strategies is extremely important because it's relationship with; pension scheme Size, Board of trustees composition, regulatory framework and pensions and administration had been examined only by a few studies.

5.6 Areas for further research

On recommendation for further research, there is an overwhelming potential for future research in the pensions industry arena. Apart from repeating the study to include a larger sample size in order to build on the existing findings, opportunities exist to conduct repeat research to include all social security providers. That way, it will allow for comprehensive use of social security data as opposed to limiting to occupational pension scheme provisions only. There is also an opportunity to follow the same line of research with a different methodology such as determining degree of influence of variables with the use of linear regression model and develop direct measures of variables and constructs.

There exists little information on the antecedents of adoption of risk management strategies, such as the organizational structure of the pension industry, legal environment and past performance of investments hence there is a need to explore if the environment is conducive for application of risk management strategies. It is therefore recommended that future research be undertaken to address these important issues. The relationship between leadership and adoption of risk management could be investigated.

In the modern corporate world, enterprise risk management is the key for each organization. Whereas pension's schemes are not enterprises in strict sense, there is a need to undertake a study on the viability and uptake of enterprise risk management or entity wide risk management by social security firms. An investigation on the risk-return balance on

constructing of investment portfolios for pensions schemes is another opening that scholars can investigate. Finally, it could be interesting to adopt this research to analyze the leadership, politics and power in implementing change toward enhancing risk management in a pension industry set up. Despite the discovery of these elements in this study, there is a need to investigate the impact of these new variables up to the logical implementation point.

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APPENDICES

Appendix 1: Introduction Letter

JONAH AIYABEI (PhD – Student)
JKUAT –CBD CAMPUS
NAIROBI

.....
Dear Sir/Madam

RE: QUESTIONNAIRE

I am a PhD student Business Administration Student at the Jomo Kenyatta University of Agriculture and Technology. One of the requirements to the award of the degree would be to write a dissertation in an area of my studies. I would be very grateful for your assistance in giving me your sincere feedback on the questionnaire attached.

I have chosen the pensions sector for my study. The gap from the reviewed literature led me to research on *‘Determinants of adopting risk management strategies by pension schemes in Kenya’*.

The research is purely for academic purpose and all information will be held in confidentiality. Please note that it would be optional to identify yourself and thus can remain anonymous.

Thank you.

JONAH AIYABEI

Appendix 2: Questionnaire/Interview Guide

Dear Sir/Madam, this questionnaire is used to collect data for academic purpose and all your response will be kept confidential. The study seeks to find out the determinants of adopting risk management strategies by pension schemes in Kenya.

Instructions: Kindly answer all the questions by ticking the option(s) and filling blank spaces provided.

SECTION 1: GENERAL INFORMATION

Please indicate (**Tick as appropriate**).

GENDER Male
 Female:

Kindly indicate the category of your age

18 – 30 years 31 -45 years 46-55 years Over 55 years

What is your position in the pension scheme (Tick as appropriate)

Trustee Administrator Principal Officer Pensions Officer

What is the design (type) of your pension scheme? Tick one.

Defined Benefits Defined Contribution

SECTION 2: BOARD OF TRUSTEES COMPOSITION

A. Election board and manual

1. Do you have in your scheme trustees an election manual? Yes No

2. Do you have in your scheme an independent election board? Yes No

B. Qualifications of Trustees

3. How many Trustees have been trained and certified by the RBA/Association of Retirement Benefits Schemes	
4. How many have undergone a trustee's certification other than the one mentioned in Q. 10 above?	

5. For each of the following statements, indicate the extent that risk management adoption strategies have been affected in your scheme. Tick once using scale 1-5, where **5 = Very great extent 4. Great extent 3. Somehow 2. Low extent 1. Very low extent.**

Indicator	1	2	3	4	5
Number of trustees in the board.					
Gender mix.					
Number of sponsor nominated trustees					
Number of elected trustees					
Number of pensioners					
Number of independent trustees					
Qualifications of trustees					

PENSION SCHEME SIZE

A. Number of Members

	< 500	500-1000	1001 - 1500	1501 - 2000	> 2000
6. How many members do you have in your scheme?					
7. What is the number of members in active service?					

B. Value of Scheme Assets (Kenya Shillings)

	< KES 1B	KES 1 – 5 B	5 B – 10B	10B – 15B	Over 15B
8. What is the value of your assets as per your most recent audited accounts?					

9. Indicate the extent to which you agree or disagree with the statements below regarding their influence on adoption of risk management strategies by your pension scheme. Use a likert scale of 1-5, where 5 = strongly agree 4. Agree 3. Somehow agree 2. Disagree 1.Strongly disagree.

	1	2	3	4	5
Number of active members					
Number of pensioners					
Value of assets					
Number of sponsors					

SECTION 4: REGULATORY FRAMEWORK

A. Investment Compliance

	Yes	NO
10. Does your scheme have an investment policy statement (IPS)?		
11. Is your scheme's IPS approved by the Retirement Benefits Authority?		
12. Was your scheme's IPS prepared with an assistance of a qualified person as per the Retirement Benefits Act?		
13. Do your scheme investments comply with your IPS?		
14. Do your scheme investments comply with IPS and RBA investment guidelines?		

B. Regulatory Compliance

	Yes	NO
15. Does your scheme have a conflict of interest policy?		
16. Do your scheme trustees have a code of conduct?		
17. Have you entered into service level agreement with the following service providers		
a) Custodian (s)		
b) Fund Manager (s)		

	Yes	NO
c) Administrator		

18. To what extent do you agree that the following factors influence adoption rate of risk management measures by your scheme. Use a likert scale of 1-5, where 5 = Very great extent 4. Great Extent 3.Moderate Extent 2. Low Extent 1. None at all.

	5	4	3	2	1
Governance Regulations					
Investment regulations					
Requirement to appoint custodian					
Trustees Training and certification					
Regulations on appointment of Fund Manager					
Regulations on appointment of Administrator					
Requirement to appointment of IPS advisor					
Requirement to appointment of external Auditors					
Requirement on appointment of Board of trustees Chairman					
Compliance requirements on filling of returns					
Requirements for holding AGM					
Requirements on benefits payments					

SECTION 5: PORTFOLIO STRUCTURE OF THE SCHEME

A. Percentage of assets holding

19. What is the percentage of your asset holding in each of the following asset classes?	<10%	11-30%	31-50%	51-70%	71-90%	91-100%
a) Domestic Quoted Equity						

19. What is the percentage of your asset holding in each of the following asset classes?	<10%	11-30%	31-50%	51-70%	71-90%	91-100%
b) Property						
c) Unquoted Equity						
d) Government Securities						
e) Corporate Bonds and Commercial Paper						
f) Term Deposits						
g) Offshore Investments						

20. In your opinion what is the extent that each of the following asset classes influence adoption of risk management strategies by pension schemes. Use a likert scale of 1-5 where 5= Very Great extent 4 =Great extent 3= Moderate extent 2=Low extent 1= Not at all

Asset Class	5	4	3	2	1
Domestic Quoted Equity					
Property					
Unquoted Equity					
Government Securities					
Corporate Bonds and Commercial Paper					
Term Deposits					
Offshore Investments					

SECTION 6: PENSION SCHEME ADMINISTRATION

21. How many members of staff does the scheme employ?

< 10 10-20 21- 50 Over 50

22. Indicate your level of agreement with the statements below on a scale of 1-5, where 1= strongly disagree, 2 =disagree, 3= somehow agree, 4= Agree, 5=strongly agree

Statement	1	2	3	4	5
Your administration of the pension scheme is efficient					
Scheme processes and procedure is well documented					
An appropriate management information system is in place to check operational risks.					
The management style at the scheme is transparent and accountable.					

23. What is the highest qualification of the scheme Administrator?(*Tick the correct answer*)

Certificate Level Diploma Level Bachelor's Degree Level
 Master's Degree level Doctorate

24. How many years' experience on pension administration does your administrator have?(Tick the correct answer)

Less than 5 Years 6 -10 years Over 10 years

25. How many days does it take your scheme to pay benefits when the documentations have been provided by the beneficiary?

1- 5 days 6 – 14 One Month Over a month

26. For each of the following elements of pension scheme administration elements, kindly indicate the extent of influence of each on adopting risk management by your scheme. Use a likert scale of 1-5, where 5 = Very high extent 4. High Extent 3.Moderate extent 2.Low extent 1.Very low extent.

	5	4	3	2	1
Qualification of the administrator					
Number of pension administration staff					
Operational efficiency					

	5	4	3	2	1
Documenting Processes and procedure of operation.					
Nature of management information system.					
A transparent and accountable Management style.					

SECTION 7: ADOPTION OF RISK MANAGEMENT STRATEGIES

A. Measure of adoption of risk management strategies

	Yes	No
Does your Board of Trustees have a Board Audit Committee?		
Do you have a risk consultant?		
Does your scheme have a risk officer?		
Do you have a software that serves your purpose well in terms of security and efficiency		
Have you established adequate internal control systems?		

27. Does your scheme regularly conduct internal audit?

NO Yes

28. Is there something that can be done to improve adoption of risk management strategies in your scheme?

Yes No

END OF QUESTIONNAIRE

Thank you for taking your time to fill in this questionnaire.

Appendix 3: Observation Schedule

Variable Description	Defined Benefits Scheme		Defined Contribution Scheme	
	Yes	No	Yes	No
Board of trustees composition				
1. Names and number of trustees displayed in financial statements				
2. Keenness and honesty				
3. Respondents tone?				
4. Enthusiastic warm reception				
5. Training program?				
Pension scheme size				
1. Referring to audited accounts?				
2. Reference to investment reports				
3. Confirmation with member register				
Regulatory framework				
1. Cross check with Retirement Benefits Act?				
2. Reference to:				
a) Trust deed and rules?				
b) Service provider's agreements?				
Portfolio structure				
1. Investment policy check?				
2. Check with the Retirement Benefits Regulations				
Pension scheme administration				
1. Sign of use of ICT?				
2. Do the respondent look intimidated?				

Appendix 4: Reliability Analysis

	Factor	Cronbach's alpha
Component 1		0.863
RMAS Appointment Of External Auditors	.866	
RMAS Benefits Payments	.831	
RMAS Filling Of Returns	.823	
RMAS Holding AGM	.812	
RMAS appointment of Board of Trustees Chairman	.810	
RMAS Appointment Of IPS Advisor	.783	
RMAM Appointment Of Administrator	.749	
RMAM Trustee Training and Certification	.668	
RMAM Appointment Of Fund Manager	.627	
RMAS influence by no. of Sponsors	.504	
Component 2		0.793
RMAS affected by No. Elected of Trustees	.664	
RMAS affected by Qualifications of Trustees	.655	
RMAS Affected By No. of Trustees in Board	.635	
RMAS affected by No. Sponsor Nominated Trustees	.626	
RMAS influence by Value of Assets	.606	
RMAS influence by no. of Active Members	.559	
RMAS affected by Gender Mix	.516	
Component 3		0.790
PA Operational Efficiency	.732	
PA Nature of MIS	.652	
PA Transparent and Accountable Mgnt. style	.643	
PA Documenting Processes and Procedure Operation	.618	
PS Property	.539	

Component 4		0.64
PS Offshore Investments	.811	
PS Unquoted Equity	.710	
PS Domestic Quoted Equity	.707	
PA No of Pension Administration Staff	.589	
Component 5		0.64
PS Corporate Bonds and commercial paper	.863	
PS Term Deposits	.747	
PS Government Securities	.617	
Component 6		1.87
RMAS affected by No. of Pensioners	.606	
RMAS affected by No.of Independent Trustees	.547	
Extraction Method: Principal Component Analysis.		
6 components extracted.		

Table 4.4b: Total variance explained

	Component					
	1	2	3	4	5	6
RMAM Appointment Of External Auditors	.866					
RMAM Benefits Payments	.831					
RMAM Filling Of Returns	.823					
RMAM Holding AGM	.812					
RMAM Appointment of Board of Trustees Chairman	.810					
RMAM Appointment Of IPS Advisor	.783					
RMAM Appointment Of Administrator	.749					
RMAM Trustee Training and Certification	.668					
RMAM Appointment Of Fund Manager	.627					
RMAS influence by no. of Sponsors	.504					
RMAS affected by No.Elected of Trustees	.501	.664				
RMAS affected by Qualifications of Trustees		.655				
RMAS Affected By No. of Trustees in Board		.635				
RMAS affected by No. Sponsor Nominated Trustees		.626				
RMAS influence by Value of Assets		.606				
RMAS influence by no. of Active Members		.559				
RMAS affected by Gender Mix		.516				
PA Operational Efficiency			.732			
PA Nature of MIS		-.515	.652			
PA Transparent and Accountable mgnt style			.643			
PA Documenting Processes and Procedure Operation			.618			
PS Property			.539			
PS Offshore Investments				.811		
PS Unquoted Equity				.710		
PS Domestic Quoted Equity				.707		

	Component					
	1	2	3	4	5	6
PA No of Pension Administration Staff				.589		
PS Corporate Bonds and Comm. Paper				.863		
PS Term Deposits				.747		
PS Government Securities				.617		
RMAS affected by No. of Pensioners						.606
RMAS affected by No. of Independent Trustees						.547
Extraction Method: Principal Component Analysis.						
6 components extracted.						

Appendix 5: Hosmer and Lemeshow Test

Table 4.44b: Contingency Table for Hosmer and Lemeshow test

		ADOPTION OF RISK MANAGEMENT STRATEGIES = 1.00		ADOPTION OF RISK MANAGEMENT STRATEGIES = 2.00		Total
		Observed	Expected	Observed	Expected	
Step 1	1	10	12.409	3	.591	13
	2	13	10.500	0	2.500	13
	3	10	9.541	3	3.459	13
	4	8	6.600	5	6.400	13
	5	1	3.015	12	9.985	13
	6	3	2.465	10	10.535	13
	7	2	2.171	11	10.829	13
	8	2	1.914	11	11.086	13
	9	1	1.645	12	11.355	13
	10	1	.739	8	8.261	9

Appendix 6: Observation Results

Variable Description	Defined Benefits Scheme		Defined Contribution Scheme	
	Yes	No	Yes	No
Board of trustees composition				
6. Names and number of trustees displayed in financial statements	7	3	41	28
7. Keenness and honesty	5	2	71	12
8. Respondents tone?	3	6	61	7
9. Enthusiastic warm reception	6	1	59	9
10. Training program?	7	5	47	51
Pension scheme size				
4. Referring to audited accounts?	4	2	64	4
5. Reference to investment reports	9	3	56	42
6. Confirmation with member register	3	3	43	36
Regulatory framework				
3. Cross check with Retirement Benefits Act?	9	1	66	2
4. Reference to:				
c) Trust deed and rules?	6	3	55	43
d) Service provider's agreements?	4	3	1	67
Portfolio structure				
Investment policy check?	7	1	19	49
Pension scheme administration				
3. Sign of use of ICT?	3	1	56	10
4. Do the respondent look intimidated?	1	3	35	33