

**THE EFFECT OF ASSET ALLOCATION ON THE FINANCIAL
PERFORMANCE OF PENSION FUNDS IN KENYA**

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DECLARATION

I declare that this Research Project is my original work and has not been submitted for an award of a degree in any other University for examination/academic purposes.

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DEDICATION

This research project is dedicated to my loving wife Juliana for her love and commitment through life and to my parents Mr. Wilfred Kiplagat and the late Mrs. Sarah Kiplagat for all the support they have accorded me in my academic endeavors.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
DB	Defined Benefit Scheme
DC	Defined Contribution Scheme
EMH	Efficient Market Hypothesis
IPS	Investment Policy Statement
NSE	Nairobi Securities Exchange
OECD	Organisation for Economic Co-operation and Development
RBA	Retirement Benefits Authority
UK	United Kingdom
USA	United States of America

ABSTRACT

Much of the previous research into the effect of asset allocation on the financial performance of pension funds has concentrated generally on developed countries with few studies being carried out in emerging markets. Not much local study has focused on establishing this critical relationship. This study therefore sought to fill the existing research gap by carrying out a survey study on the effect of asset allocation on the financial performance of pension funds in Kenya. The main objective of pension funds is the provision of retirement and other benefits to the employees and their respective dependants as provided in the Trust Deed and Rules of the pension fund. The impact of portfolio asset allocation on the financial performance of pension funds in Kenya is critical in determining whether asset allocation as selected by Fund managers who are mandated by Trustees of Pension funds to carry out the investment function has an impact of either reducing or increasing the overall financial performance of the Fund assets. The study adopted a descriptive survey and utilized a sample of 40 schemes drawn from a population of 1232 schemes in Kenya. The findings of the study showed that asset allocation explained 58% of the variability of fund performance and that 42% was due to other factors such as the manager's selection, timing of investments and securities selection within an asset class and the management style adopted by the fund managers of the fund. Further the study established that of all the asset classes permitted by the Retirement Benefits Authority (RBA), investments in Government securities, property, cash deposits and quoted shares was relatively more important in determining the overall performance of the pension funds.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The main objective of pension funds is the provision of retirement and other benefits to the employees and their respective dependants as provided in the Trust Deed and Rules of the pension fund. The impact of portfolio allocation on the financial performance of pension funds in Kenya is critical in determining whether asset allocation as selected by Fund managers who are mandated by Trustees of Pension funds to carry out the investment function has an impact of either reducing or increasing the overall financial performance of the Fund assets.

Asset allocation strategies adopted by Trustees in Kenya should comply with the guidelines provided by the Retirement Benefits Authority (RBA) and contained in the Retirement Benefits Act. With the movement of pension schemes structure from Defined Benefits (DB) Schemes to Defined Contribution (DC) Schemes there is increased need to measure performance of assets held by Pension Funds. The growing importance of Pension Funds has boosted the need for methodologically sound principles of Asset allocation (Swietanowski, 1999).

Quantitative restrictions on the share of particular types of assets held by the fund limit the dispersion of outcomes, particularly for defined contribution schemes. In most mandatory schemes, this leads to a 'single portfolio' environment where members of the scheme are forced to hold basically the same portfolio. Most common are limits on risky assets such as shares and corporate bonds. Often, foreign investments are curtailed.

As per regulatory requirements, Trustees should develop an IPS to guide them in the allocation of assets of Pension scheme funds. The main purpose of the IPS is to assist the Board of Trustees of the Pension fund in effectively supervising, monitoring and

evaluating the Performance of the schemes investment assets. The IPS will dictate what proportions of the various asset classes available will the Fund managers invest in. The IPS should not be viewed as a static document and hence will require to be reviewed at least once every three year but may be reviewed periodically to take account of any new information acquired and changes in the investment environment of the scheme. Despite the uniqueness of each pension scheme's IPS, all asset allocation must be within the prescribed limits set by the RBA regulations.

Since Pension fund assets are usually marked-to-market (valued at market price), an asset allocation strategy that leads to drop in market value of the Fund will cause a drop in performance of the fund. This study will critically investigate the Pension Industry in Kenya and the effect of asset allocation on the financial performance of Pension Funds.

1.1.1 Asset Allocation

Reilly and Brown (1997), define asset allocation as the process of deciding how to distribute an investor's wealth among different countries and asset classes for purposes of investment. A policy statement includes investor's objectives, constraints, and investment guidelines. They are developed to determine the overall investment strategy. It does not indicate specific securities to purchase and when they should be sold; they should provide guidelines as to the asset classes that should be included in the portfolio and the relative proportions of the investor's fund that should be invested in each class.

The Organisation for Economic Co-operation and Development (OECD) guidelines on pension fund asset management as recommended by the council state that legal provisions may include maximum levels of investment by category (ceilings) to the extent that they are consistent with and promote the prudential principles of security, profitability, and liquidity pursuant to which assets should be invested. Legal provisions could also similarly include a list of admitted or recommended assets. Within this framework, certain categories of investments may be strictly limited. The legal provisions should not prescribe a minimum level of investment (floors) for any given category of investment, except on an exceptional and temporary basis and for compelling prudential

reasons. All legal provisions setting forth quantitative portfolio limits should be regularly assessed to determine whether they are unnecessarily inhibiting the ability of pension fund asset managers to implement optimum investment strategies and amended to the extent necessary.

In Kenya the RBA Act sets out maximum limits for which a pension fund can invest in a particular asset class. The limits specified are as follows; East Africa government securities 90%, Fixed and Time deposits 30%, Fixed income 30%, listed Equities 70%, unlisted equities 5%, offshore investments 15% and property 30%.The Act does not however place a floor for asset allocation.

There are two types of asset allocation strategies namely: strategic and tactical asset allocation. Strategic asset allocation refers to how portfolio funds will be divided given the portfolio manager's long term forecasts of expected returns, variance and covariance, (Sharpe,1996). It involves the asset managers deciding on the asset classes as well as the specific securities with superior performance in invest in. Tactical asset allocation on the other hand refers to how the funds are to be divided at any particular moment given the investors short-term forecasts. The decision determines what deviations based on current market valuations should be made from the strategic asset allocation projections (Lofthouse,2001).

The purpose of strategic asset allocation is to provide the optimal mix of investments that has the potential to produce the desired returns and meet the current and future liabilities, with the least amount of fluctuation in the overall value of the investment portfolio. By spreading funds among several styles or investment types there is an increased probability that if one asset type is decreasing in value, another is increasing in value.

1.1.2 Financial Performance of Pension Fund

Hinz et al. (2010) observed that since 1980s, the structure of arrangements to produce retirement income has gradually moved from defined benefit (DB) systems to various types of arrangements in which the provision of pensions is backed by assets, either in

individual accounts or in collective schemes. This change has been motivated principally by governments seeking to lessen the fiscal impact of aging populations and to diversify the sources of retirement income. They further suggest that one of the key results is that many pension systems are now in the process of becoming asset backed. This has increasingly linked retirement incomes to the performance of these assets, resulting in participants being exposed to the uncertainties of investment markets to determine the level of benefits that they will ultimately receive.

In general, the purpose of measuring portfolio performance is to determine whether portfolio managers add value with respect to passive or naïve investment strategies, typically represented by feasible and well-diversified benchmarks. Under the assumptions of Efficient Market Hypothesis (EMH), it is difficult for managers to add value, so it should not be surprising to find that the different pension schemes have had performance similar to their benchmarks (Walker and Iglesias, 2010).

Walker et al. (2010) further explain that in situations where financial markets do not exhibit strong form EMH characteristics, fund managers can add value. The performance can be measured by assessing the degree to which fund managers have been able to deliver investment returns that are commensurate with the risk level assumed.

1.1.3 Effect of Asset allocation on Financial Performance of Pension Funds

The asset allocation process refers to the decision process of determining the amount of funds that should be allocated to each financial asset in the existing opportunity set. It is the investor's objective to obtain the highest risk adjusted return as possible. Brinson et. al. (1986) showed that the asset allocation decision is by far the most dominant factor of portfolio performance as it explain more than 91% of the variation in asset returns. Furthermore, Litterman (2003) suggestions that asset allocation can be divided into two different types of decisions: asset allocation between different asset classes, e.g. stocks and bonds and asset allocation within one asset class, e.g. countries and sectors.

Countries that have introduced mandatory funded pensions often had little experience of investing; these pension reforms necessitated strict regulation in terms of asset allocation. The lack of experience of investment and managing risk lead to poor portfolio decisions. Indeed, investing in emerging economies is more risky than investing in more developed countries. Capital markets can be fragile, lacking both liquidity and transparency.

1.1.4 Pension Funds in Kenya

Pension funds in Kenya have been established for the purpose of providing retirement benefits to its members at old age. Pension benefits are usually locked-in the pension fund and can only be accessed at Retirement. Pension Funds in Kenya are regulated by RBA through the RBA Act.

Through the Retirement Benefits Act (1997) and subsequent regulations of 2000, the investment guidelines of pension funds came into force. The core purpose of constituting the Retirement Benefits Act and Retirement Benefits Regulations was to deal with the problems that the industry was facing at the time. All existing and new pension schemes, unless founded under a written law, were required to be established under an irrevocable trust, be distinctly separated and maintained from any other funds under the control and influence of the sponsors, engage the services of various external professional services providers among them fund managers, custodians, auditors, actuary all who would provide necessary expert advice to trustees.

The Retirement Benefits Authority does not specify the assets in which scheme should invest in but rather provides guidelines on the asset classes. The pension scheme has the discretion to select the assets that they deem best suitable to give the best optimal return in accordance to the scheme's fundamentals.

Legislation requires that a prudent approach of investment be adopted by pension schemes. Pension scheme investments must therefore constitute a well-diversified and well-dispersed portfolio (Chirchir, 2007).

1.2 Research Problem

In Kenya financial performance of pension funds has been critical to the sustainability of the schemes to enable them meet their obligation to members. A key aspect has been the how the fund's assets are managed in order to achieve the desired returns. Stux (1995) divides pension fund portfolio management by using two steps. First, a pension fund needs to decide which broad asset classes to invest in. Typically, the asset classes include fixed income, equities, real estate, money market instruments, venture capital and private investments. This step is called strategic asset allocation and it is the most important part of a pension fund's asset management, as the strategic asset allocation heavily affects the performance of a pension fund. The second step includes the actual implementation of the chosen strategic asset allocation by choosing internal or external fund managers and putting in practice the particular investment strategies and security selection process. This step is also important, but has less influence on pension fund's overall performance

Blake, Lehmann and Timmermann (1999) analyzed a data set on UK pension funds. Their main finding was that strategic asset allocation accounts for most of the ex post variation of UK pension funds' returns. Moreover, the vast majority of funds had negative market-timing estimates.

Ibbotson and Kaplan (2000) in their study of US retirement benefit funds concluded that the main determinant of investment performance of a retirement benefits fund is the asset allocation, rather than the stock selection. Asset allocation explained about 40% of the variation of returns among the funds. The method of data analysis used was of regression analysis and ratio analysis.

Puttonen (2005) empirically examined the strategic asset allocation and the asset/liability issues in the Finnish defined benefit pension funds. The results indicated that there is a relationship between the liability structure and the asset allocation. While pension funds with younger participants have more equity exposure, more mature pension funds have more fixed income investments.

A study that was carried out in Kenya by Nguthu (2009) showed that the variation in returns over time for pension schemes explained up to 62.4% by investment policy adopted by the trustees of the scheme. Another study carried out by Kagunda (2011) showed that asset allocation can explain a significant amount of the difference in returns across time and hence a primary determinant of return performance of unit trusts in Kenya.

Omondi (2013) carried out a study to establish the relationship between asset allocation and performance of pension funds in Kenya. The findings of the study were that asset allocation explains 28% of the variability of fund returns.

Ammann and Ehmann (2014) carried out a study to establish the relationship between governance, asset allocation and performance of pension funds in Switzerland. The findings of the study were Asset allocation weights of Swiss pension portfolios are primarily related to non-governance-related factors such as size, legal form and the ratio of active plan members to pensioners. Since larger pension funds have more investment opportunities and more comprehensive internal risk management structures, they are able to invest in riskier asset classes that promise higher returns. Large pension funds in Switzerland hence “buy” a significant part of their superior performance with higher volatility, as indicated by our analysis.

Despite the studies carried out locally on portfolio allocation and performance of pension funds, there are no studies that have attempted to explain the effect of asset allocation on the financial performance of Pension funds in Kenya. The study intends to address this research gap by addressing the following research question: What is the effect of asset allocation on the financial performance of Pension funds in Kenya?

1.3 Objective of the Study

To investigate the effect of asset allocation on the financial performance of pension funds in Kenya.

1.4 Value of the Study

The study will help Board of Trustees of Pension schemes to know the extent to which regulations on various asset classes have an effect on the performance of their funds.

The findings of this study will be helpful to the regulator (RBA) as it will contribute towards the formulation of better policies and rules that will be relevant in guiding investment of pension funds in various asset classes in Kenya.

The findings of the study will inform the regulator (RBA) on the need of revising the asset allocation limits. The study will help the trustees of pension schemes to know the asset classes that have the greatest influence on the performance of their funds

Researchers within the pension industry will also find the study useful as it will increase the existing body of knowledge and provide a basis for carrying out further research in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter will discuss an overview of the literature reviewed providing a basis for the study and the concepts. The chapter also highlights theories guiding the study, previous studies conducted and new developments related to the study and provide an overview of key ideas for the study.

2.2 Theoretical Review.

Asset allocation and Pension Fund Management is based on a number of theories upon which the proposed study is anchored on.

2.2.1 Modern Portfolio Theory

Modern portfolio theory has its roots in mean-variance portfolio analysis. This theory was pioneered by Markowitz (1952) in his paper “Portfolio Selection”. Markowitz found that the different correlations between assets could be utilised to reduce the risk in a portfolio or to obtain additional return without increasing the risk. He developed a model which took into account the interactions between different investment opportunities, and the correlation between them, to optimise the ratio between risk and return. According to Markowitz, a combination of several types of assets may reduce risk, provided that the investor chooses types of assets which move as independently of each other as possible. Once this condition has been met, the best possible ratio between risk and return will be achieved. MPT emphasizes how risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of risk, emphasizing that risk is an inherent part of a higher reward. According to the theory, it is possible to construct an “efficient frontier” of optimal portfolios offering the maximum possible expected return for a given level of risk.

2.2.2 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) was developed primarily by Ross (1976a, 1976b). It is a one-period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure. Ross argues that if equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns on the assets are approximately linearly related to the factor loadings. (The factor loadings, or betas, are proportional to the returns' covariances with the factors.)

The APT is a substitute for the Capital Asset Pricing Model (CAPM) in that both assert a linear relation between assets' expected returns and their covariance with other random variables. (In the CAPM, the covariance is with the market portfolio's return.) The covariance is interpreted as a measure of risk that investors cannot avoid by diversification. The slope coefficient in the linear relation between the expected returns and the covariance is interpreted as a risk premium. Such a relation is closely tied to mean-variance efficiency.

2.2.3 Barbell Theory

This is an allocation theory where assets are focused on the extreme end on the risk spectrum, just like with a barbell, the weight is on two ends. This would be much different from a standard (MPT) which has become the standard method of asset allocation in the past 20 years. The maturities of the securities included in the portfolio are concentrated at two extreme maturities. For example, you might allocate 80% of your money to inflation protected treasury securities and 20% of your money to very aggressive small growth company stocks, Walnut Hill Advisors LLC.

2.2.4 The Black Litterman Theory

Black Litterman (1992) proposes portfolio models applicable for portfolio construction. Litterman (2003) suggests that asset allocation can be divided into two different types of decisions: asset allocation between different asset classes, e.g. stocks and bonds and asset allocation within one asset class, e.g. countries and sectors.

The theory seeks to overcome problems that institutional investors have encountered in applying modern portfolio theory in practice. The model starts with the equilibrium assumption that the asset allocation of a representative agent should be proportional to the market values of the available assets, and then modifies that to take into account the 'views' (i.e. the specific opinions about asset returns) of the investor in question to arrive at a bespoke asset allocation (Black and Litterman 1992)

2.3 Determinants of Financial Performance of Pension Funds.

There are various factors that determine the performances of pension funds. These are discussed below:

2.3.1 Volatility

French (2012) stated that volatility (risk) of an asset class affects the returns of an investment. Low volatility is associated with potential low returns while the vice versa is also true. The researcher advocates the asset allocation for retirement savings should consist of a wide range of assets including cash, bonds, property and equities (shares), whose overall impact will be to have a medium risk portfolio. The age profile of a pension scheme contributes to the degree of risk that a pension scheme would be willing to take in order to realize optimum returns.

2.3.2 Portfolio Weights

Block and French (2002), showed that the weighting of individual securities within the portfolio. The weight that a portfolio manager assigns to a given security in a portfolio can make a contribution to return that is just as important as the security selection and investment timing decisions. The researcher found that fund managers tended to hold consistent in constructing and maintaining equal weights in management on retirement benefits funds.

2.3.3 Interest Rates

Flannery and James (1984) in their study on the effect of interest rate changes on the common stock returns of financial institutions found that returns on equities are found to be positively correlated with interest rate changes. This implies that where retirement funds are invested in equities and the money market, both asset classes will lose if interest rates decrease and the vice versa would hold true if there was an increase in interest rates.

2.3.4 Investment Horizon

This is the planned liquidation date of the investment or substantial part of it. This concept is best supported by the yield curve. A normal yield curve (that is upward sloping) suggests that long term bonds are sold at higher yields than short term bonds. Horizon needs to be considered when investors choose between assets of various maturities, such as bonds, which pay off at specified future dates, considering that this has an impact on the financial performance of specified portfolios. (Blake et al.,1999)

2.3.5 Regulations

Investment guidelines issued by RBA to regulate the way in which trustee of retirement benefit schemes invest retirement funds. This affects financial performance of the funds as an investment manager is restricted from investing, for example, more than 70% in listed equities. (OECD, 2006)

2.4 Empirical Review

Brinson, Hood and Beebower (1986) and Brinson et al (1991) in their study of US corporate pension plans concluded that the investment policy explained 93.6% of the total variation of the actual returns of the funds. In their study, 91 retirement benefit funds were studied over a 10 year period. The funds must have had a discretionary mandate with the investment manager. The asset classes considered were the equities and bond portfolios and cash equivalent portfolios. The fund returns were decomposed to the selection and timing reasons. Regression of the policy returns against the actual returns was done and the level of correlation determined.

Brinson, Singer and Beebower (1991) showed that 91.5% of the portfolio returns were attributable exclusively to strategic asset allocation. Elkin (1999) also stated that asset allocation, rather than stock picking or market timing, is by far the most important factor that determines the returns that a portfolio would generate over time.

Ibbotson and Kaplan (2000) in their study of US retirement benefit funds concluded that the main determinant of investment performance of a retirement benefits fund is the asset allocation, rather than the stock selection.

Blake, Lehmann and Timmermann (1999) examined the asset allocation decisions of 364 individual, UK company pension schemes using data that spanned the period from 1986 to 1994. The criterion they used in identifying the sample was that each fund should have been managed by the same manager over this period, and that this manager should also have been responsible for the asset allocation of the fund over this uninterrupted period, in other words these were balanced mandates. Using this sample Blake et al found little variation in the performance of these schemes, or in the strategic asset allocation decisions that they made over time. In addition they found that the vast majority of time variation in returns was due to the strategic asset allocation decisions, very little of the variation was due to stock selection. They concluded that the empirical regularities that they observed were most likely due to the legal and economic environments under which these managers operated.

Using the quarterly returns on a much larger sample (2,175) of segregated UK pension schemes spanning the period from 1983 to 1997 Thomas and Tonks (2001) investigate the performance of UK equity portfolios managed by investment managers, in contrast to the performance of the balanced portfolios investigated by Blake et al. Thomas and Tonks' conclusions were consistent with those of Blake et al. The variety of techniques used to assess the quality of fund performance all suggested a very narrow cross-sectional dispersion in returns, which suggested that the managers were all "closet trackers". They also conclude that on the whole there were negative returns to both selectivity and to market timing.

Omony, (2003) observed that risk and return are the key considerations in investment practices of Pension Fund Managers in Kenya. Current income is not their fund objective; however, the most predominant objective will be capital preservation. Pension schemes also differ from collective investment schemes as they have a minimum funding requirement and they are established to invest funds to meet pension liabilities. That is they are invested with the expectation that they will be sufficient to pay pension entitlements when these are due.

Mugo (1999) observed that factors identified in finance literature are considered in investment decision by institutional investors at the NSE. However, the relevance of the factors is different as insurance companies and fund management companies consider company factors more important while Retirement Benefits Schemes consider industry factors more relevant. However institutional investors should not be looked at as homogeneous and therefore these findings cannot be generalized for Collective Investment Schemes.

Nguthu (2009) in his research to establish how much asset allocation policy contributed to the returns level retirement benefit fund in Kenya found that the variation in returns over time for pension schemes is explained up to 62.4% by investment policy adopted by the trustees of the scheme. Other factors such as securities selection, timing of investments and managers' selection explained the remainder. The study was done on 40 segregated occupational schemes in Kenya and returns analyzed using regression analysis and descriptive statistics.

In a study carried out on "The relationship between asset allocation and financial performance of pension funds" (Omondi,2013), the researcher made the following conclusions: Asset allocation explains 28% of the variability of fund returns. The study also established that of all the asset classes permitted by the Retirement Benefits Authority (RBA), investments in equities was relatively more important than investments in fixed deposits in determining the overall performance of the pension funds.

2.5 Summary of Literature Review

Most studies tend to conclude that on average asset allocation strategies explain to a significant extent the performance of funds. Local study by Nguthu (2009) explained that asset allocation explained around 62% of the returns of pension funds in Kenya. Another study by Omondi (2013) explains the relationship between asset allocation and financial performance of pension funds. However, the scope of the study did not include the extent to which asset allocation limits contributed to the overall performance of the fund. This is important as regulator/policy makers and trustees in Kenya will be guided which on how ceiling placed on investment of certain asset classes has an impact on the fund performance so as perform their duties of maximization of members wealth in a more informed manner.

There has therefore not been any study carried out on pension funds in Kenya to determine the extent to which the impact of asset allocation limits has on the financial performance of pension funds in Kenya. This therefore justifies the need for the current study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter consists of the research methodology that was used in conducting the study. The research methodology outlines the procedures used in conducting the study which is basically the research design, population, data collection and methods of analysis which are described.

3.2 Research Design

Rajendra (2008) defines research design as the linkage and organization of conditions for collection and analysis of data in a manner that aims at combining relevance to the research purpose with economy in the procedure. He further argues that research design focuses on the structure of an enquiry, which leads to the minimization of the chance of drawing the wrong casual inferences from the data.

The research design selected was a descriptive survey. Travers (1969) states that descriptive surveys are conducted to establish the nature of the existing situation or condition. This research design provides a means to gather, analyse and interpret the impact of asset allocation on the performance of pension funds in Kenya.

3.3 Population

The population of the study comprised of 1,232 occupational pension schemes as at May 2014 as per the list of registered schemes on the RBA website. The population represents all the registered pension schemes in Kenya, with varying fund value size, categorised as segregated and is either a provident fund or pension scheme.

3.4 Sample Design

The criteria for selection was as follows; the entire population will be divided into four strata based on a range of fund values, that is, below Kes.200M, between Kes.200M and Kes.500 M, between Kes 500M and Kes 1B and Over Kes.1B. From each stratum 10

schemes were selected randomly to ensure that each of the schemes has an equal chance of being selected.

The pension scheme selected must be a segregated Pension scheme which have been in existence for the last 5 years and must have used the same fund manager over the period of study. The schemes were then stratified based on their fund value as at December 2013.

The study sample was 40 selected occupational retirement benefits schemes registered by RBA and will be chosen using stratified sampling technique.

3.5 Data Collection

Secondary data was collected for the study. This data was obtained from the RBA database. The returns and asset allocation data will be obtained from RBA since this is a compliance requirement for all fund managers and is provided on a quarterly basis.

3.6 Data Analysis

Data collected for each of the pension schemes was quantitative in nature. The data was analysed as per below criterion. To determine the extent to which asset class limits contributes to the overall financial performance of the fund, a multiple regression model was used to analyse the data. A similar model was used by both Nguthu (2009) and Omondi (2013).

3.6.1 Analytical Model

The following linear multiple regression model was used for data analysis:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon$$

Where:

Y is the Financial Performance as measured by ROI (return on investment)

Where; ROI= (Current Fund value-Previous Fund Value)/previous Fund Value

α is the constant

β is the regression coefficient

x_1 , is the weight of cash in the fund

x_2 , is the weight of fixed deposit in the fund

x_3 , is the weight of fixed income in the fund

x_4 , is the weight of Government security in the fund

x_5 , is the weight of quoted equities in the fund

x_6 , is the weight of unquoted equities in the fund

x_7 , is the weight of immovable property in the fund

x_8 , is the weight of offshore investment in the fund

ε is the error term

3.6.1 Test of Significance

Tests of significance was used in the study which include Bivariate Correlation between the asset classes and portfolio returns, R- square and ANOVA.

R-Square (Co-efficient of Determination) was used to establish how much of the variability of fund returns was caused or explained by the independent variable over time. Analysis of Variance (ANOVA) was used to determine the linear relationship among the variables in the regression model.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

In this chapter the findings of the data analysis are presented. The data of the sampled schemes was collected and analyzed in response to the objective of the study. The objective of the study was to investigate the effect of asset allocation and financial performance of pension funds in Kenya. A sample of 40 pension schemes that had invested in segregated funds had consistently used one fund manager over the period of the study and had been in existence for the last 5 years as at the end of 2013 was used. The findings presented in this chapter demonstrate the effect of asset allocation on the financial performance of pension funds and illustrates further the extent to which each asset class contributes to the overall financial performance of the fund.

4.2 Findings

The objective of the study was to establish the relationship between asset allocation and financial performance of pension funds in Kenya. To achieve this, quantitative data was collected for each of the pension schemes and analysed in two stages. First, tests of significance and descriptive statistics, such as correlations, the R-Square (Coefficient of Determination), Analysis of Variation (ANOVA) and Coefficients. The second stage was to determine the extent to which each asset class contributes to the overall financial performance of the fund by estimating the relative importance of the regressors in the linear regression by performing Paired Sample T-Tests.

The output and findings of the analysis have been presented in the tables below:

4.2.1 Statistical Significance and Descriptive Statistics

Correlations between the dependent variable (Return on Investment) and the independent variables (weights of various asset classes) was determined. This analysis was to locate the critically important asset classes on which Return on Investment depend.

Table 4.1: Correlations

	Cash_D eports	Corpor ate_Bo nds	Fixed_ Deposi ts	Gover nment _Secur ities	Offshor e_Inves tments	Other_I nvestm ents	Quoted_ Shares	Unquote d_Shares	Property_I nvestments	Return_ On_Inv estment s
Return Pearson _On_In Correlati vestme on nts	-.268	-.209	.180	-.343*	.088	.008	-.276	.055	-.018	1
Sig. (2- tailed)	.100	.203	.272	.032	.594	.962	.090	.739	.914	
N	39	39	39	39	39	39	39	39	39	39

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Findings

As shown in table 4.2.1 above, the correlation index for the relationship between Returns on Investment and fixed deposits and offshore investments, is 0.18 and 0.088 respectively, which are below 0.4. This result indicates that there is a weak positive correlation between ROI and assets weights of fixed deposits and offshore investments.

The correlation indices for the relationships between ROI and Quoted shares and cash, and corporate bonds are -0.276 and -0.268 and -0.209 respectively, which are below -0.4. These results indicate that there is a weak and negative correlation between ROI and asset weights of quoted shares, cash, and corporate bond.

The correlation index for the relationship between Returns on investment and Government Securities is -0.343, which is between -0.4 and -0.7. This result indicates that there is moderate and negative correlation between ROI and the weights of government securities.

4.2.2 Regression Output: Model Summary

The impact of variation over time was determined by R-Square (Co-efficient of Determination) which explains how much of the variability of returns on investment was caused or explained by the asset weights over time.

Table 4.2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.764 ^a	.583	.454	.0566482

a. Predictors: (Constant), Property_Investments, Other_Investments, Unquoted_Shares, Cash_Deposits, Quoted_Shares, Corporate_Bonds, Offshore_Investments, Fixed_Deposits, Government_Securities

Source: Research Findings

From table 4.2.2, the value of R-square is 0.583 which explains how much of the variation in the value of the dependent variable (Return on Investment) is explained by the regression model. Regressing returns on asset allocation gives an R-square of 0.583, which indicates that approximately 58% of the variation in returns on Investment can be explained by the allocation in the different asset classes.

4.2.3 Regression Output: Analysis of Variation (ANOVA)

Table 4.3: Analysis of Variation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.130	9	.014	4.511	.001 ^a
	Residual	.093	29	.003		
	Total	.223	38			

a. Predictors: (Constant), Property_Investments, Other_Investments, Unquoted_Shares, Cash_Deposits, Quoted_Shares, Corporate_Bonds, Offshore_Investments, Fixed_Deposits, Government_Securities

b. Dependent Variable: Return_On_Investments

Source: Research Findings

From table 4.3.1, the linear relationship among the variables in the regression was determined by examining the Analysis of Variance (ANOVA) results obtained from the analysis. The value of F was found to be statistically significant at a level of less than 0.05, suggesting that there is a linear relationship among the variables.

4.2.4 Regression Output: Correlation Coefficient

Table 4.4: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.909	.138		6.601	.000
	Cash_Deposits	-1.561	.558	-.379	-2.800	.009
	Corporate_Bonds	-.870	.539	-.214	-1.614	.117
	Fixed_Deposits	.068	.285	.035	.238	.814
	Government_Securities	-.843	.166	-.867	-5.081	.000
	Offshore_Investments	-.335	.535	-.089	-.627	.536
	Other_Investments	-.626	.486	-.182	-1.287	.208
	Quoted_Shares	-.717	.190	-.551	-3.771	.001
	Unquoted_Shares	-.749	.300	-.397	-2.501	.018
	Property_Investments	-.741	.212	-.691	-3.492	.002

a. Dependent Variable: Return_On_Investments

Source: Research Findings

From table 4.4.1, the value of the constant can be determined by studying the results of the coefficients. Government securities and Quoted Equities predictors are statistically significant at 5%.

From the beta weights in the regression results, government securities, followed by property, quoted shares and cash deposits have a higher contribution to the prediction model.

4.3 Interpretation of the Findings

From the analysis, the asset classes that had the most impact on the financial performance of the fund were Government Securities and cash Deposits. These had a moderate

negative correlation with the overall performance of the funds. This finding was in agreement with the ANOVA analysis in Table 4.3.1 and coefficients analysis in Table 4.4.1 the analysis found that there is a linear relationship between Returns on Investment and Cash Deposits, Government Securities, property and quoted shares. Corporate bonds, unquoted shares and Offshore Investments had a similar relationship but the strength of the correlation was found to be weak. Only fixed deposits was found to have a positive correlation with fund performance but the relationship was weak.

R-Square (Co-efficient of Determination) was determined to establish how much of the variability of fund returns can be caused or explained by asset allocation over time. The R Square and the Adjusted R Square values which are 58.3% and 45.4% respectively show that the weighted combination of the predictor variables explained approximately 58% of the variance of the fund returns the remaining 42% is explained by other factors such as asset class timing, security selections and manager selection. The R Square value also shows that the fund managers for the schemes under analysis adopt an active approach to management of the funds. Active management of funds approach is adopted because of the quantitative assets restrictions placed by the Retirement Benefits Authority and also adopted by the trustees in their investment policies.

This finding is similar to findings by Omondi (2013) which showed that 28% of the return difference was explained by the asset allocation. The increase of about 30% could be attributed to increased awareness of the pensioners on the need for trustees to increase value of their investments. This has increased pressure on the trustees to actively manage pension funds to increase fund value. In addition, Retirement Benefits Authority introduced Trustee Development Programme Kenya (TDPK) which is aimed at building capacity of the trustees in order to increase pension fund values. RBA has made it mandatory for each scheme to train all trustees in order to achieve this objective.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary, conclusion and recommendations of the study. The study intended to address the research question: What is the effect of asset allocation on the financial performance of Pension funds in Kenya? Secondary quantitative data was collected and analysed using SPSS in order to satisfy the objectives of the study. The following tests were carried out on the data: Correlation, R Square, ANOVA and Coefficients of correlation. The findings of the analysis have been documented and have formed the basis for this chapter. This chapter presents a summary of the findings, the conclusion and the recommendations of the study.

5.2 Summary

The objective of the study was to establish the effect of asset allocation on the financial performance of Pension funds in Kenya. From the findings of the analysis, there is a linear correlation between fund performance and weights of asset classes. This was demonstrated by the results of Correlation, ANOVA and Coefficient analyses.

Correlation was found to be strongest between fund performance and portfolio weights of Cash Deposits, Government Securities, property and quoted shares. Further test was performed by analysing the data using R-Square. The R-Square of the data was found to be 58.3% which indicate that differences in the fund returns were explained by approximately 58% of the investment policy. The remaining 42% was explained by other factors such as assets selection, timing and manager selection.

5.3 Conclusion

The objective of the study was to establish the effect of asset allocation on the financial performance of pension funds in Kenya. From the study it was established that there is a linear correlation between fund performance and the weights of asset classes with the

strongest correlation being between fund performance and asset weights of cash deposit, quoted shares, Government securities and property. Further, the study also showed that 58% of the variability among fund performance is due to policy differences in asset allocation of the various funds. The balance of about 42% is due to other factors such as the manager's selection, timing of investments and securities selection within an asset class and whether the manager adopts an active style of management of the fund.

5.4 Recommendations for Policy

From the findings of the study that Government securities, quoted securities and property are relatively more important than investments in other asset classes in the determination of the overall performance of the pension funds, this study therefore also recommends that fund managers should invest a large proportion of the pension funds in these asset classes since they have the most relevance in the determination of fund performance.

The investment guidelines provided by RBA were developed in the year 2000 and have not been revised since. Due to the time lapse from the time the guidelines were developed and the time this study was done, some variables that were used in the development of the guidelines may have changed and the restrictions of the guidelines may no longer represent the needs of the industry.

The study finds that there is a need for RBA to relax the quantitative asset restrictions which limits the fund managers' ability to make investment decisions based on the risk return analysis. Fund managers should be allowed to fully exercise active management of the funds without strictly adhering to the investment guidelines provided by RBA, but only use them as a guide. This is because 58% is dependent on the investment policies.

5.5 Limitations of the Study

Confidentiality of data being exposed to the researcher. Availability of more data would have given a better representation of the population given analysis of a larger sample.

The study was restricted by conversion of schemes from DB to DC schemes as per government policy implementation in June 2010. This caused a variance in the Fund value of various schemes hence causing inconsistency in the Fund values.

The study was restricted to data of pension funds managed by few Fund managers. This was to ensure consistency in valuation of the investments. Different managers adopt different valuation and performance calculation methods. Data collection and therefore analysis was restricted to schemes under managers who use similar valuation and performance calculation methods.

The study was restricted to analysis of returns of segregated retirement benefit schemes which account for only 40% of the retirement benefits schemes in Kenya. The balance of 60% invests in guaranteed funds issued by insurance companies whereby it is difficult to determine the asset allocation for each of the guaranteed funds since it is not a statutory disclosure requirement under the Insurance Act.

The study also excluded Individual Pension Plans (IPPs) which cater for persons who do not have access to occupational pension schemes and opt to make personal contributions to the Plans. This is because there is no statutory requirement for the IPPs to submit performance returns to RBA.

5.6 Suggestions for Further Studies

A study on the effect of asset allocation on the financial performance of other financial sectors and how it compares to the retirement benefits sector.

A similar study should be carried out on retirement benefits schemes in the East Africa Region and establish how it compares to the study carried out in Kenya.

A similar study should be carried out on retirement benefits schemes that have invested in guaranteed funds issued and managed by insurance companies and Individual Pension Plans to determine if the same conditions hold if they are included in the sample to be studied.

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APPENDICES

APPENDIX I

INVESTMENT GUIDELINES

Item	Categories of Assets	Maximum percentage of aggregate market value of total assets of scheme
1	Cash and Demand Deposits in institutions pooled fund licensed under the Banking Act of the Republic of Kenya	5%
2	Fixed Deposits, Time Deposits and Certificates of Deposits in institutions licensed under the Banking Act of the Republic of Kenya	30%
3	Commercial Paper, Corporate Bonds, Mortgage Bonds and loan stocks approved by the Capital Markets Authority non listed bonds and other instruments issued by private companies, provided that the bond or instrument has been given investment grade rating by a credit rating agency registered by the Capital Markets Authority, and collective investment schemes incorporated in Kenya and approved by the Capital Markets Authority reflecting this category	30%
4	Kenya, Uganda or Tanzania Government Securities and infrastructure bonds issued by public institutions and collective investment schemes incorporated in Kenya, Uganda or Tanzania and approved by the Capital Markets Authority reflecting this category	90%, or 100% in the case of scheme receiving statutory contributions
5	Preference shares and ordinary shares of companies	70%

	quoted in a stock exchange in Kenya, Uganda or Tanzania and collective investment schemes incorporated in Kenya and approved by the Capital Markets Authority reflecting this category.	
6	Unquoted shares of companies incorporated in Kenya and collective investment schemes incorporated in Kenya and approved by the Capital Markets Authority reflecting this category	5%
7	Offshore investments in bank deposits, government securities, quoted equities and rated Corporate Bonds and offshore collective investment schemes reflecting these assets	15%
8	Immovable property in Kenya and units in property Unit Trust Schemes incorporated in Kenya and collective investment schemes incorporated in Kenya and approved by the Capital Markets Authority reflecting this category	30%
9	Guaranteed Funds	100%
10	Any other assets	10%

Source: Retirement Benefits Act

APPENDIX II

DATA CAPTURE SHEET

Scheme Name:			
Year			
Asset Class	1st Half	2nd Half	Actual Asset Allocation
Cash			
Fixed Deposit			
Fixed Income			
Government Securities			
Quoted equities			
Unquoted Equities			
Immovable Property			
Offshore			
Total Fund Value			