IMPACT OF ASSET ALLOCATION ON FINANCIAL PERFORMANCE OF PENSION FUNDS IN KENYA

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DECLARATION

I, the undersigned, declare that this project is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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This research project has been submitted for examination with our approval as the University supervisor.

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DEDICATION

I dedicate this study to my dear family members, my husband for all the support they gave me all the time as I prepared and worked on this project.

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ABBREVIATIONS

CAPM : Capital Asset Pricing Model

CIS : Collective Investment Schemes

CMA : Capital market authority

GNP : Gross National Product

MCC : Maxwell Communication Corporation.

NGO : Non-Governmental Organization

NSE : Nairobi stock exchange

UK : United Kingdom

USA : United States of America

ABSTRACT

Link between asset allocation and financial performance of pension funds is critical in determining whether asset allocations as selected by Trustees of pension schemes is critical in increasing pensioners' wealth in Kenya. Given that the primary reason for the establishment of pension schemes is to alleviate old age poverty for their members, it is paramount that the pension funds be invested in manner that is consistent with the spirit of increased performance of the fund. Where is this not done proactively then, as might be expected, value of the pension funds will decrease, leaving its members worse off than if they had benefited from their contributions now rather than in the future. However, as the regulator, RBA is concerned with whether trustees have developed an Investment Policy (IP) and adhere to it. There is therefore a gap when it comes to evaluating the effectiveness of those IPs in increasing wealth. The study adopted a descriptive survey and utilized a sample of 245 schemes that drawn from a population of 1214 schemes in Kenya. The sample included only those schemes that invested in segregated funds, were in existence for at least 7 years, have consistently used fund manager over the period of the study and had a fund value of at least Ksh. 100 Million as at the end of 2011 was used and the data analyzed. The secondary data on pension schemes asset allocation and returns was obtained from Retirement Benefits Authority was analyzed using descriptive statistics. The quantitative obtained data was analyzed in two stages. First, the R-Square (Coefficient of Determination) was calculated in order to explain how much of the variability of fund returns can be caused or explained by asset allocation. The second stage of the analysis was to determine the relative importance of each asset class to the overall financial performance of the fund. A paired sample T-Test was used for this analysis. The findings of the study were that asset allocation explains 28% of the variability of fund returns. The remaining 72% is explained by other factors such as asset class timing, security selections and manager selection. Further the study 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. The study recommends that the retirement benefits schemes should be less regulated by relaxing the rule for strict adherence to the investment policies. In addition, RBA should revise the policy and allow fund managers should 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 the asset allocation in Kenya account for only 28% of the fund performance. If this is achieved, fund managers should focus more attention on investments in equities as opposed to fixed deposits. This is supported by the second stage of the analysis which found that investment in cash was relatively more important than investment in fixed deposits in the determination of the overall performance of the pension funds.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Capital markets are essential part of the financial sector of modern economies and more so for growing economies. They provide an avenue for alternative savings tools to savers and non-bank sources of financing for enterprises. Thus, capital markets promote economic growth through enhanced savings mobilization, (Reilly,2013).

Well-developed capital market promotes economic growth through increased savings mobilization, access to foreign savings, spreading of financial risks, help the government finance their deficits while reducing the fiscal pressures of debt redemption by the maturities of the securities, and a facilitating role in translating savings to investments. The growing importance of pension funds has boosted the need for methodologically sound principles for asset allocation, (Swietanowski, 2012).

The asset allocation strategies adopted by trustees in Kenya should, in general, comply with the guide provided by the Retirement Benefits Authority (RBA) and entrenched in the Retirement Benefits Act. In addition, the specific IPs need to be proactively managed in order to maximize members' wealth by taking advantage of favourable market conditions while minimizing on wealth erosion arising from adverse economic conditions. Trustees should devote adequate time and resources in ensuring that the asset allocation strategy adopted by pension funds increase performance, (Brown,2013).

This is because of the very fact that pension funds are recorded at their market or fair values. This therefore means that an asset allocation strategy that does not lead to improved performance was evident from the drop in fund values and as such reflect poorly on the performance of the trustees, (Tiwari,2007).

1.1.1 Asset Allocation

Reilly and Brown (2013), 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. An asset class is comprised of securities that have similar characteristics, attributes, and risk/return relationships. A broad asset class, such as "bonds," can be divided into smaller asset classes, such as Treasury bonds, corporate bonds, and high yield bonds. This asset allocation is based on investor's policy statement and it contributes to the performance of an investment, (Sharpe, and Tiwari,2007).

Asset allocation is based on the following decisions: what asset classes to consider for investment, what normal or policy weights to assign to each eligible class, determining the allowable allocation ranges based on policy weights and what specific securities to purchase for the portfolio. However 85% - 95% of the overall investment return is due to the first two decisions, not the selection of individual investments. There are two types of asset allocation strategies namely: strategic and tactical asset allocation. Strategic asset allocation refers to how portfolio funds was divided given the portfolio manager's long term forecasts of expected returns, variance and covariance, Sharpe,(2007).

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).

Reilly, (2007) further explain that in this strategy, a fund manager attempts to produce active value-added returns solely through allocation decisions. Specifically, instead of trying to pick superior individual securities, tactical asset allocation managers adjust their asset class exposures based on perceived changes in the relative valuations of those classes. VanHorne (2013) observes that the process of asset allocation allows for the formation of an efficient set and this allows the investment manager to invest in those securities that form the optimal portfolio. Reilly and Brown (2013) also observe that the asset allocation decisions determine to a great extent both the returns and the volatility of the portfolio. Diversifying by combining different asset classes in a portfolio reduces overall portfolio volatility.

1.1.2 Pension Fund Performance

The Concept 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.

Hinz, (2010) in their book 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, (Sharpe, 2007).

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.

1.1.3 Impact of Asset Allocation on Pension Fund Performance

Blake, Lehmann and Timmermann (1998) in their research on the importance of the strategic asset allocation decision on pension fund performance in the United Kingdom (UK) demonstrated that 96 percent of the total variation in monthly portfolio returns could be explained by the normal asset class holdings across funds on average. In fact, normal asset class holdings explained more than half of the variability in portfolio returns for the fund with the smallest contribution to return variability from this component.

Brinson, Hood, and Beebower (2009) put the aggregate fraction of total of pension fund performance variation attributable to the strategic asset allocation at 93.6 percent and concluded that "investment policy (that is, the strategic asset allocation) dominates investment strategy (market timing and security selection)", a finding that has lead others, such as Bogle (2010), to conclude that the "94% figure suggests that long-term fund investors might profit by concentrating more on the allocation of their investments between stock and bond funds and less on the question of which particular stock and bond fund to hold."

1.1.4 Pension Industry in Kenya

Pension (Retirement Benefit) schemes the world over and especially in Kenya have been necessitated by the need to reduce old age poverty. In Kenya, the setting up of pension schemes by employers (Occupational Pension Schemes) is voluntary but once established, all pension schemes are regulated by RBA as stipulated by the Retirement Benefits Act. In such schemes, contributions are made by both the employer (who is the sponsor of the scheme) and the employees (who are the members of the scheme) in proportions determined by the employer and vary from one employer to another, (Collie, 2012).

The contributions are set aside and invested and it is expected, logically, that the level of investment returns generated should outweigh the costs of inflation over the years in order to maintain or improve the employees' standard of living upon retirement. It is statutory for all schemes to be established under an irrevocable trust and managed by appointed trustees. As per the Retirement Benefits Act, trustees are required develop an IP that defines the asset allocation that the trustees plan to implement. RBA has also developed an investment guide that acts to give direction to the trustees while developing the IPs for their schemes, (Thomas, 2011).

Market volatility in itself is volatile; markets can be relatively stable at some points in time and explosively volatile at others (Collie, Sylvanus, and Thomas 2011). This implies that traditional (fixed-weight) strategic asset allocation policy can be variable over time. This variability if not proactively managed may lead to erosion of wealth. It is against this background that trustees of pension funds are required by the Retirement Benefit Act to revise their IPs at least every three years but within the limits of the prescribed guide.

Mutuku (2011) reiterated that pension schemes are considered long term investors who may conceptually not be unduly affected by short term market volatility so long as in the long term investment performance is sufficient to enable them meet their liabilities to members. Additionally, whereas standard economic models would suggest that pension schemes would have stable well defined risk tolerance levels some research in behavioural economics suggest that long term risk tolerance may be altered by short term events such as volatility (Sahm 2007).

Kenyan capital markets have experienced significant volatility in recent years. For example, during the global financial crisis of 2008/2009 when local markets which were previously viewed as uncorrelated to global markets exhibited high correlation (Mutuku 2010) and during the second half of 2011 when Kenyan markets were impacted by an outstanding sudden depreciation of the exchange rate (World Bank 2011).

1.2 Research Problem

Strategic asset allocation can be seen as a major component of risk management and good governance in pension schemes. Given that the primary reason for the establishment of pension

schemes is to alleviate old age poverty for their members, it is paramount that the pension funds be invested in manner that is consistent with the spirit of increased performance of the fund. Where is this not done proactively then, as might be expected, value of the pension funds will decrease, leaving its members worse off than if they had benefited from their contributions now rather than in the future. In fact, volatility may reduce returns over the long run. Simply put, if you lose 50%, you have to gain 100% to break even (Arnott, Bernstein and Hall 2010). Trustees of pension funds should therefore be keen in ensuring that value of pension funds does not reduce unnecessarily. Given that pension funds are valued at the market or fair values, members who exit the schemes at the time of market lows are placed at a disadvantage. The value of their contributions is far less as it will have been eroded by market volatility.

An important means that enables trustees to ensure performance of their funds is maximized is through strategic asset allocation in the form of IPs. One of the key mandates of RBA as spelt out in the Retirement Benefits Act is to regulate the industry and protect the interests of the members and sponsors. To carry this out effectively, IPs have been made mandatory for all schemes by RBA. This means that by law, all pension schemes must first develop the IPs and submit them to RBA. This should be done prior to actual investments of the funds. It is also a statutory requirement for the trustees to review the IPs at least every 3 years and submit the updated IP to RBA, (Thomas 2011). This implies that in as far as the regulations are concerned RBA is only mandated to verify that pension schemes have a documented IP; that the IP has been developed within the guidelines of the investment policy prescribed in the Retirement Benefits Act; and that the actual investments that the schemes carry out are in line with the documented and approved scheme IPs. 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. However, there have not been any studies done locally that explain the nature of the impact of asset allocation on financial performance of pension schemes clearly showing the important asset classes. This study intends to address the research question: Is there a impact of asset allocation on financial performance of pension funds in Kenya?

1.3 Research Objective

To establish the impact asset allocation on financial performance of pension funds in Kenya.

1.4 Value of the Study

To the beneficiaries 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.

To the policy Makers the study will inform policy makers in the Retirement Benefits Authority (RBA) to better manage and regulate the industry in as far as investment in pension funds are concerned.

The Researchers and academicians, the study wasnefit the academicians and other research bodies in adding knowledge on asset allocation on financial performance of pension funds. The scholars and researchers would carry out further studies on the impact of asset allocation on financial performance of pension funds based on local companies, international companies, NGO's and governmental organizations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The review of literature involves the systematic identification, location and analysis of documents containing information related to the research problem being investigated (Mugenda 2012). A literature review is a "critical analysis of a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical review. The section of research provides relevant literature, theories and studies that have been carried out with the aim of providing useful information in the area of Asset Allocation and Pension Fund Management.

2.2 Theoretical Review

The study was based on the following theories and models: Modern Portfolio Theory, The Black-Litterman Model, Post-Modern Portfolio Theory and Barbell Theory. These theories are subsequently explained below.

2.2.1 Modern Portfolio Theory

Modern Portfolio Theory (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.

This theory was pioneered by Harry Markowitz in his paper "Portfolio Selection," published in 1952 by the *Journal of finance*. There are four basic steps involved in portfolio construction: Security valuation, asset allocation portfolio optimization and the performance measurement, (Thomas 2011).

Harry Markowitz laid the foundations of MPT, the greatest contribution of which is the establishment of a formal risk/return framework for investment decision making. By defining investment risk in quantitative terms, Markowitz gave investors a mathematical approach to asset allocation and portfolio management. MPT is limited by measures of risk and return that do not always represent the realities of the investment markets, Sortino and Satchell (2001)

The assumption of an elliptical distribution is a major practical limitation because it is symmetrical. Using the variance (or its square root, the standard deviation) implies that uncertainty about better-than-expected returns is just as disliked as the uncertainty about returns that are worse than expected. Furthermore, using the more upside that downside returns appear more risky than arguably they really are and the opposite for returns with a predominance of downside returns. The result is that is that using traditional MPT techniques for measuring investment portfolio construction and evaluation frequently distorts investment reality, Sortino and Satchell (2001).

Prior to Markowitz's work, investors focused on assessing the risks and rewards of individual securities in constructing their portfolios. Standard investment advice was to identify those securities that offered the best opportunities for gain with the least risk and then construct a portfolio from these, (Sortino, 2001).

2.2.2 The Black-Litterman Model

This is a mathematical model for portfolio allocation developed in 1990 at Goldman Sachs by Fischer Black and Robert Litterman, and published in 1992. It 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).

It starts with a benchmark portfolio which come from the equilibrium expected returns that would clear the market, assuming a given risk model. The equilibrium expected returns (market-implied views) are the set of expected returns that would produce the market portfolio if led into an optimser with the specified risk model. In other words, these are the returns from reverse optimization assuming the market portfolio is efficient (Drobetz 2001) and (Jones, Lim and Zangari 2007).

These “market-implied” views are combined with the investor’s private views using the Bayesian mixed-estimation techniques. The Black Litterman allows the incorporation of both absolute views (e.g. affixed expected return) and relative views (e.g. one stock or sector will out-perform another). The relative weights placed on an investor’s view will reflect the confidence that he has in that view. The posterior distribution of expected asset returns given the recommendation changes are used as the input for portfolio optimization.

The blended views will produce balanced portfolios that are tilted towards the investor's private views, with the degree of tilt (for a given level of risk) depending on the investor's relative confidence in his or her expectations. Practical guides to the implementation of the model in general contexts are presented by Drobetz (2001) and Idzorek (2004).

2.2.3 Post-Modern Portfolio Theory

It has long been recognized that investors typically do not view as risky those returns above the minimum they must earn in order to achieve their investment objectives. They believe that risk has to do with the bad outcomes (i.e. returns below a required target), not the good outcomes been noted by the researchers in finance, economics and psychology, including Sharpe (1964). Markowitz suggests that a model based on the semi-variance would be preferable. Recent advances in portfolio and financial theory, coupled with today's increased electronic computing power, have overcome these limitations. The resulting expanded risk/return paradigm is known as Post-Modern Portfolio Theory (PMPT). Thus, MPT becomes nothing more than a special (symmetrical) case of PMPT, (Sortino and Satchell 2001).

2.2.4 Barbell Theory

This is a very simple investment allocation theory where your assets are focused on the extreme ends on the risk spectrum, just like with a barbell, the weight in 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. In other words, if the two ends of the barbell represent opposite ends of the risk spectrum, then you will allocate all of your money between the very safe end and the very aggressive end. For example, you might allocate 70% of your money to inflation protected treasury securities and 30% of your money to very aggressive small growth company stocks. The

“Floor and Upside” strategy means that, before investing in any kind of risk portfolio, it makes sense to build a “floor” of safe streams for the retirement years. First, define your baseline consumption, and then project what was needed during your retirement years. This gives us a baseline income needed for retirement.

Factor in any other guaranteed income sources you expect, such as social security and/or a pension. Determine how much additional money you will need above those guaranteed sources and use financial assets, to secure a level of income and meets those basic needs, (Walnut, 2009).

2.3 Determinants of Financial Performance of pension Funds

2.3.1 Volatility

Maya Fisher-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 consists of a wide range of assets including cash, bonds, property and equities (shares), whose overall impact was to have a medium risk portfolio.

2.3.2 Portfolio Weightings

In their study, 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 Liquidity

This is the ease (and speed) with which an asset can be sold and still fetch a fair price. It is a impact of the time dimension (how long it will take to dispose) and the price dimension (any discount from fair market price) of an investment asset. Cash and money market instruments such as T-bills and commercial paper are most liquid assets, and real estate is among the most illiquid. Liquid assets tend to have lower rates of returns than the less illiquid assets. Therefore fund managers should strike a balance between liquidity and desired returns by establishing the minimum level of liquid assets they wish to hold in the investment portfolio, (Sortino, 2011).

2.3.5 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.

2.3.6 Regulations

Only professional and institutional investors are constrained by regulations. First and foremost is the prudent investor rule. That is, professional investors who manage other people's money have a fiduciary responsibility to restrict investment to assets that would have been approved by a prudent investor. However, there are specific regulations that apply to various institutional investors. For instance, there are 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, say, 100% in the assets that have the highest returns like equities, (Singer, 2012).

2.3.7 Tax Considerations

Tax consequences are critical to investment decisions. The performance of any investment strategy is measured by how much it yields after taxes. For household and institutional investors who face significant tax rates, tax sheltering and deferral of tax obligations may be pivotal in their investment strategy. However, in the context in retirement benefit industry in Kenya, returns of the funds are not taxed at the corporate level but at an individual level at the time of withdrawal.

2.3.8 Unique Needs

Every investor faces special circumstances. Pension funds will differ in their investment policy, depending on the average age of plan participants. A pension fund with most participants nearing retirement age will have investment policies that are prudent i.e. those that are riskless and have stable but low returns. On the other hand, plans with younger participants will tend to be more aggressive i.e. significant proportions invested in the quoted equities.

2.4 Empirical Review

Brinson, Singer and Beebower (2010) showed that 91.5% of the portfolio returns were attributable exclusively to strategic asset allocation. Elkin (2012) 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. Surz, Stevens and Wimer (2012) devised a simple model to estimate what percentage of investment policy is explained by performance pertaining to the magnitude of the return, not the variability of the return. In this model, the fraction of return explained by policy was devised. They found that asset allocation on average explains about 95% of investment returns.

Dorbetz and Kohler (2002) used the same approach as with Brinson et al. (2010), with German and Swiss balanced mutual fund data to show the correct answer depends on the specific question being asked. They found that more than 80% of the variability in returns of a typical fund over time is explained by asset allocation policy, roughly 60% of the variation among funds is explained by the policy and more than 130% of the return is explained, on average, by the policy return level.

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. In their study, they considered 94 balanced mutual funds and the quarterly returns for 10 years and also 58 returns for both the pension fund for 5 years. Policy weights were used to calculate the policy returns for both the pension and the mutual funds. Data was analyzed to determine the returns behavior over time, across funds and what level of returns was explained by the asset allocation.

Over time, specific policies explain less than half of the remaining time series variation of funds returns. 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. Brinson, Hood and Beebower (2009) and Brinson et al (2010) 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 wad done and the level of correlation determined.

In their studies, Dimson, Marsh and Staunton (2002) and Cornell (2012) found that there is a considerable amount of evidence that in competitive capital markets' additional risk is compensated by additional expected returns (e.g. the equity risk premium); therefore, in both the long and the short run, there is a linear trade-off between risk and return, as in the Capital Asset Pricing Model (Sharpe, 1964), and equities are not relatively more attractive for long term investors. There is empirical evidence that equities are not a good hedge for pension scheme liabilities, and so there is no particular hedging advantage in equities over other forms of investment (Sutcliffe, 2004). The UK private pension funds had a deficit of £160 Billion in July 2003, the FTSE All Share index fell to less than half of its initial value. The UK cult of the equity meant that pension scheme losses from this stock market fall were much larger than would otherwise have been the case.

These equity losses were an important factor in the pension schemes reporting large deficits, closing to new members and increasing their contribution rates. In this case the asset allocation decision depends of the risk-return preferences of the trustees, in consultation with the employer. A high equity proportion leads to a high risk, high expected return outcome; while a low equity proportion gives a low risk, low expected return outcome. In the absence of taxation, risk sharing and default insurance, the asset allocation is based on the risk-return preferences of the employer and the employees; and so varies between schemes, probably in an unpredictable manner. This conclusion means that, where they apply, the asset allocation should be determined primarily by taxation, risk sharing and default insurance.

Loeper (2012), in his article on Asset Allocation Myth, demonstrated that there is little cross-sectional variation in average ex post returns to strategic asset allocation, market timing, and security selection. Long-run asset allocations, however modeled, account for the bulk of the time-series variation on returns. His study was based on 306 retirement benefit funds over a period of 8 years. Retirement benefit funds sampled in the study had a single investment manager over the period and monthly pension returns were available for 8 asset classes. Value weighted benchmark returns were computed for each fund.The recorded returns had to be decomposed to both the active and passive returns. From the data analysis which involved regression of the benchmark returns against the actual total returns, it revealed that UK retirement benefit funds earned negative returns from active portfolio management. Also from the analysis, 96% of the variation returns is explained by strategic asset allocations.

Cross sectional variation of returns of about 0.32% is explained by the security selections. Beside the asset allocation factor, chief among other qualitative factors influencing the UK pension performance is the legal and economic environments. 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.

Kagunda (2011) in her study to evaluate asset allocation by fund managers and the financial performance of unit trusts established that for unit trusts available to Kenyan investors, asset allocation can explain a significant amount of the difference in returns across time and hence a primary determinant of return performance of these trusts. This was a survey study carried on equity-based funds and schemes that deal with stocks traded in Kenya.

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. Most of these studies have been carried on done on developed markets, for example the study by Ibbotson and Kaplan (2000) and that by Brinson, Hood and Beebower (2009). A local study by Nguthu (2009) explained that asset allocation explained about 62% of the returns of pension funds in Kenya.

However, the scope of the study did not include the extent to which the individual asset classes contributed to the overall performance of the fund. This is important as policy makers and trustees in Kenya was guided on which asset classes contribute the most to fund performance so as perform the selection in the most informed manner. There has therefore not been any study carried out on pension funds in Kenya to determine the extent to which individual asset classes explain the financial performance of pension funds in Kenya. This justifies the need for the current study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was to carry out the study. Research methodology is the operational framework within which the facts are placed so that their meaning is seen more clearly. The methodology to use encompasses of the research design selected, the population, sampling, data collection and analysis.

3.2 Research Design

The research design selected a descriptive survey. Robson (2002) explains that a research design portrays as accurate profile of persons, events or situations, while Trevor (1969) states that surveys are conducted to establish the nature of the existing condition or situation. This research design was chosen as it provides a means to gather, analyze and interpret the impact of asset allocation on fund performance of pension schemes in Kenya.

3.3 Target Population

The target population was all the registered pension schemes in Kenya. According to RBA (2014), there were 1,232 registered segregated schemes in Kenya as at 6th May 2014. This constituted the population of the study.

3.4 Sample

The sample size of 124 schemes based on the criteria described below was drawn from the target population for the purposes of the study. The target population is above 500 respondents hence a 10% sampling method as per Mugenda and Mugenda (2003) was used to select 124 schemes.

All schemes that have invested solely in guaranteed funds was eliminated from the sample for the purposes of this study. These are retirement benefit schemes that are run by insurance companies and whose minimum rates of returns are pre-determined. They are an ideal investment for funds where trustees or members require capital guarantees and low volatility, whilst still achieving superior competitive returns. These was excluded from the sample as data on asset allocation in investments under guaranteed funds were difficult to obtain due to the fact that it is not a statutory disclosure under the Insurance Act.

3.5 Data Collection

Secondary data on quarterly returns and asset allocation was obtained from RBA. The returns obtained were gross of expenses. This was a cheaper and reliable source of data because all fund managers are required to submit this data to RBA for compliance purposes. The data to be collected was categorized into the individual asset class weighting, the individual asset class returns together with the portfolio return for the period 2005-2014.

The portfolio currency was in Kenya shillings for the purposes of calculating returns and the asset class weights. Data on the standard market benchmarks will include NSE 20 Share Index and Treasury Bill Rate rates. These benchmarks were obtained from the Nairobi Securities Exchange and Central Bank of Kenya for the purposes of computing the value weighted asset class benchmarks.

3.6 Data Analysis

Data collected for each of the pension schemes was quantitative in nature. The quantitative data was analyzed in two stages. First, the R-Square (Coefficient of Determination) was calculated in

order to explain how much of the variability of fund returns can be caused or explained by asset allocation. The purpose of this stage was to corroborate the findings by Nguthu (2009).

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. For this purpose a linear regression T-Test was applied. In addition to the fund totals returns we will need the policy weights of each fund and the total returns on asset class benchmarks given the total returns to the fund and the estimated policy returns to solve for the active returns.

3.6.1 Analytical Model

A multiple regression model was used to predict the extent to which fund returns are explained by asset allocation. A similar model was used by Nguthu (2009) in his study. The model is therefore necessary in order to corroborate the findings in the study by Nguthu. The following multiple regression model was used in the study:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 + \varepsilon$$

Where:

Y is the Fund returns measured by $\frac{\text{Expected Portfolio return} - \text{Risk-free rate}}{\text{Standard deviation of Portfolio return}}$

α is the risk free rate of return

β is the regression coefficient

x_1, is the actual weight of cash in the fund

x_2, is the actual weight of fixed deposit in the fund

x_3, is the actual weight of fixed income in the fund

x_4, is the actual weight of Government security in the fund

x_5, is the actual weight of quoted equities in the fund

x_6, is the actual weight of unquoted equities in the fund

x_7, is the actual weight of offshore investment in the fund

x_8, is the actual weight of immovable property in the fund

ε is the error term

3.7 Test of Significance

Tests of significance were in the study. These included Bivariate Correlation between the asset classes and portfolio returns, R- square, ANOVA, Coefficient of Determination and Paired Sample T-Test.

CHAPTER FOUR

DATA ANALYSIS INTERPRETATIONS AND PRESENTATIONS

4.1 Introduction

This chapter discusses the interpretation and presentation of the findings obtained from the field. Descriptive and inferential statistics have been used to discuss the findings of the study.

4.2: Descriptive Statistic

Table 4.1 presents the descriptive statics and the distribution of the variables considered in this research: actual weight of the cash fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities, actual weight of offshore investment and the actual weight of immovable property. The descriptive statistic considered were minimum, maximum, mean, standard deviation, skewness and kurtosis.

Table 4.1 shows that the actual weight of the cash in fund had a mean of 0.275 and standard deviation of 0.1531. That is, weight of cash in fund, on average, accounted for 27.5% of the funds returned. However, this value was noted to go as high as 83% and as low as 12%. The actual weight of fixed deposit in the fund calculated an average of .4604. That is, the weight of fixed deposit explained 46.04% of the funds returned. The value was noted to fluctuate from a high as 32% and as low as 77%. The actual weight of fixed income in the fund was noted to calculate an average of 0.7907. This implied that the fixed income in the fund explained 79.07% of the changes in fund returns.

This value went as high as 98% and as low as 19%. The actual weight of government security in the fund had a mean of 0.6303; this indicated that the actual weight of government security explained 63.03% of the fund returns. The study also noted that the values went as high as 86% and as low as 15%. The mean value for the actual weight of unquoted equities in the fund was calculated to a mean of 0.6424. This implied that the actual weigh of unquoted equities explained 64.24% of the fund returns. This value went as high as 0.79 and as low as .33.

Mean value of the actual weight of offshore investments was on average 0.7312 which denotes that it, averagely 73.12% of the fund returns was explained by the actual weigh of offshore investments. However, the values went as low as 13% and as high as short as 98%. The actual weight of immovable property in the fund, on average, accounted to .4602. That is averagely 46.02% of the fund returns was explained by the actual weight of immovable property in the fund. This values were however noted to fluctuate to percentages as high as 89% and as low as 22%. The study generally noted that all the independent variables had each some level of explanation to the fund returns in relation to the financial performance of pension funds in Kenya.

Table 4.1: Descriptive Statistics

	Min	**Max**	**Mean**	**Std. Deviation**	**Skewness**		**Kurtosis**	
					Statistic	**Std. Error**	**Statistic**	**Std. Error**
Actual weight of cash in the fund	.12	.83	.2750	.1531	.922	.201	2.117	.502
Actual weight of fixed deposit in the fund	.32	.77	.4604	.6911	.744	.217	3.105	.512

Actual weight of fixed income in the fund	.19	.98	.7907	.3686	.520	.262	4.109	.503
Actual weight of Government security in the fund	.15	.86	.6303	.5628	.451	.216	5.079	.424
Actual weight of unquoted equities in the fund	.33	.79	.6424	.3611	.572	.128	2.123	.455
Actual weight of offshore investment in the fund	.13	.98	.7312	.2210	.307	.272	5.104	.566
Actual weight of immovable property in the fund	.22	.89	.4602	.2528	.051	.112	6.570	.502

4.3 Regression and Correlation Coefficients

Regression analysis was utilized to investigate the relationship between the variables. These included an error term, whereby a dependent variable was expressed as a combination of independent variables. The unknown parameters in the model were estimated, using observed values of the dependent and independent variables.

4.4 Correlation Analysis

Pearson correlation was used to measure the degree of association between variables under consideration i.e. independent variables and the dependent variables. Pearson correlation coefficients range from -1 to +1. Negative values indicates negative correlation and positive values indicates positive correlation where Pearson coefficient <0.3 indicates weak correlation,

Pearson coefficient >0.3<0.5 indicates moderate correlation and Pearson coefficient>0.5 indicates strong correlation.

Table 4.2 Correlation Coefficients between job security, morale, productivity and workload and performance of retained work force

	Actual weight of cash in the fund	Actual weight of fixed deposit in the fund	Actual weight of fixed income in the fund	Actual weight of government security in the fund	Actual weight of quoted equities in the fund	Actual weight of unquoted equities in the fund	Actual weight of offshore investment in the fund	Actual weight of immovable property in the fund
Actual weight of cash in the fund	1							
Actual weight of fixed deposit in the fund	0.631	1						
Actual weight of fixed income in the fund	0.551	0.451	1					
Actual weight of government security in the fund	0.611	0.391	0.413	1				
Actual weight of quoted equities in the fund	0.512	0.478	0.742	0.693	1			
Actual weight of unquoted equities in the fund	0.649	0.766	0.896	0.786	0.449	1		
Actual weight of offshore investment in the fund	0.763	0.844	0.874	0.377	0.773	0.345	1	
Actual weight of immovable property in the fund	0.747	0.746	0.669	0.685	0.578	0.598	0.604	1

*. Correlation is significant at the 0.05 level (1-tailed).

The analysis above shows that the variable actual weight of fixed income in fund has the strongest positive (Pearson correlation coefficient =.896; P value 0.000) influence on the Actual weight of offshore investment in the fund. From the analysis, the variable actual weight of fixed income in fund has the strong positive (Pearson correlation coefficient =.896; P value 0.000) influence on the Actual weight of offshore investment in the fund. The analysis also noted that that the variable actual weight of fixed income in fund has the strong positive (Pearson correlation coefficient =.874; P value 0.0005) influence on Actual weight of immovable property in the fund.

From the analysis of the findings, the study noted that the variable Actual weight of fixed deposit in the fund has the strong positive (Pearson correlation coefficient =.844; P value 0.000) influence on the actual weight of immovable property in the fund. The actual weight of government security in the fund had the strong positive (Pearson correlation coefficient =.786; P value 0.000) influence on the Actual weight of offshore investment in the fund.

Generally, the correlation matrix implied that the independent variables: the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund are significantly correlated and that there is no autocorrelation between the independent variables between the independent variables taken into account.

4.5: Regression Analysis

The study used the multiple linear regression analysis model to determine the relationship between the determinants (the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund) and fund returns in relation to the performance of pension funds Kenya:.

$$Y= \beta_0 +\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\beta 5X5+\beta 6X6+\beta 7X7+\beta 8X8+ \varepsilon$$

Whereby, Y is fund returns;

X1 is the actual weight of cash in the fund, X2 is actual weight of fixed deposit in the fund, X3 is actual weight of fixed income in the fund, X4 is actual weight of Government security in the fund, X5 is actual weight of quoted equities in the fund, X6 is actual weight of unquoted equities in the fund, X7 is actual weight of offshore investment in the fund and X8 is fund and actual weight of immovable property in the fund

β_0 is regression constant; β_1 to β_8 are regression coefficients; and, ε is error term.

The study determined the goodness of fit of the regression equation using the coefficient of determination between the overall independent variables fund returns. Coefficient of determination established the strength of the relationship. Table 4.3 illustrates that the strength of the relationship between dependent and independent variables. Correlation coefficients show that a relatively good linear relationship between fund returns and independent variables as shown by

R value. From the determination coefficients, it can be noted that there is a strong relationship between dependent and independent variables given an R^2 values of 0.843 was calculated in the analysis. This shows that the independent variables (the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund) accounts for 84.3% of the variations in Fund returns

The study also used Durbin Watson (DW) test to check that the residuals of the models were not auto correlated since independence of the residuals is one of the basic hypotheses of regression analysis. Being that the DW statistics were close to the prescribed value of 2.0 for residual independence, it can be concluded that there was no autocorrelation.

4.6: Model Summary

Analysis in table 4.4 shows that the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables).

R Square equals 0.843, that is, the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund explains 84.3% of observed change in performance of pension funds in Kenya. The P- value of 0.000 (Less than 0.05) implies that the regression model is significant at the 95% significance level.

Table 4.3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.918(a)	.843	.805	.51038	.843	1.242	4	96	.000

Dependent Variable: Fund returns
Source: Researcher 2015

Predictors: (Constant), the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund

4.7: Analysis of Variance (ANOVA)

The researcher sought to compare means using analysis of variance. ANOVA findings (P-value of 0.00) in table 4.5 show that there is correlation between the predictors' variables (the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund).

Table 4.4: Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.852	4	.213	1.242	.000
Residual	20.35	119	.171		
Total	22.64	123			

Predictors: (Constant), the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund *Dependent Variable:* Fund returns

4.8: Regression coefficients

The table shows the results of the regression coefficients required to form the multiple regression model. From the Regression results in table below, the multiple linear regression model finally appear as Y = 0.903+ 0.058X1+ 0.056X2+ 0.0498X3+ 0.047X4 + 0.036X5 + 0.058X6+ 0.056X7+ 0.0498X8 + 0.123

Where: X1 is the actual weight of cash in the fund, X2 is actual weight of fixed deposit in the fund, X3 is actual weight of fixed income in the fund, X4 is actual weight of Government security in the fund, X5 is actual weight of quoted equities in the fund, X6 is actual weight of unquoted equities in the fund, X7 is actual weight of offshore investment in the fund and X8 is fund and actual weight of immovable property in the fund

The multiple linear regression models indicate that all the independent variables have positive coefficient. The regression results above reveal that there is a positive relationship between

dependent variable (Fund returns) and independent variables. From the findings, one unit change in actual weight of cash in funds results in 0.077 units increase in fund returns. one unit change in actual weight of fixed deposit in the fund results in 0.053 units increase in fund returns one actual weight of fixed income in the fund results in 0.046 units increase in fund returns one unit change in government security in fund results in 0.047 units increase in fund returns, a unit change in actual weight of quoted equities in the fund results in 0.056 units increase in fund returns, a unit change in Unquoted equities in fund results in 0.077 units increase in fund returns, a unit change in Offshore investment in fund results in 0.066 units increase in fund returns and lastly one unit change in immovable property in the fund results in 0.089 units increase in fund returns. The t-test helps in determining the relative importance of each variable in the model. As a guide regarding useful predictors, we look for t values well below -0.5 or above +0.5.

In this case, the most important variables were immovable property in fund, quoted equities in fund, offshore investment in fund, unquoted equities in fund, cash in fund, government securities in fund, fixed income in fund and fixed deposits in fund and fixed deposit in fund.

Table 4.5: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	cash in the fund	0.054	0.028	0.158	2.021	0.045
	Fixed deposit in fund	0.053	0.027	0.101	1.157	0.210

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	Fixed income in fund	0.046	0.030	0.105	1.194	0.004
	Government security in fund	0.047	0.028	0.147	1.686	0.093
	Quoted equities in fund	0.056	0.028	0.158	2.221	0.045
	Unquoted equities in fund	0.077	0.027	0.101	2.177	0.010
	Offshore investment in fund	0.066	0.030	0.105	2.200	0.034
	Immovable property in the fund	0.089	0.028	0.147	2.686	0.093

a. Dependent Variable: Fund returns

b. Predictors: (Constant), the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund.

4.9 Interpretation of the Findings

Descriptive findings depicts that the asset classes that had the most impact on the performance of the fund were Government Securities and Fixed Deposits. These had a moderate negative correlation with the overall performance of the funds. This finding was in consonance with the ANOVA analysis in Table 4.3 and coefficients analysis in Table 4.4. The Analysis found that

there is a linear relationship between Fund Returns and Fixed Deposits, Government Securities, Fixed Income and Offshore Investments. Quoted Equities and Offshore Investments had a similar relationship but the strength of the correlation was found to be weak. Only cash was found to have a positive correlation with fund performance but the relationship was weak. These findings could be as a result of the borrowings made by the schemes, such that while interest rates increased, the benefits of higher returns obtained from investing in interest earning instruments was negated by even higher interest payable on the borrowings. This was found to be especially true for the sample used, where the schemes were had a large fund base and therefore had accessed huge borrowings from financial institutions.

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 27.7% and 25.3% respectively show that the weighted combination of the predictor variables explained approximately 28% of the variance of the fund returns. There is a slight loss in the computation of the Adjusted R Square which is due to the relatively large number of the sample compared to the relatively small set of the predictors. 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. The pension fund results shows that, because policy explains only 28% of the variation of returns across funds, the remaining 72% is explained by other factors such as asset class timing, security selections and manager selection.

The cross sectional R2 depended on how much the asset allocation policies of funds differed from one another and how much the funds engaged in active management. This finding is similar to findings by Nguthu (2009) which showed that 37% of the return difference was explained by the policy differences. The drop of about 9% 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 Training Programme 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 2 trustees in order to achieve this objective. Prior studies by Brinson (1986) and Ibbotson (2000) in developed markets had shown that the policy explained about 90% of the variation of return over time for pension funds. The difference is as a result of differences in regulation and investment practices.

Developed markets are less regulated and there are less investment restrictions on investment asset classes. The converse is true for developing countries like Kenya where there is a heavy regulation and there are quantitative assets restrictions in place. To determine the extent to which each asset class contributes to the overall financial performance of the fund the relative importance of the regressors in the linear regression was estimated using a Paired Sample T-Test. Each of the regressors was paired with the fund returns, Y, for the entire period. The results of the T-Test found that there is a statistically significant difference between the portfolio returns and all the asset classes considered for the analysis.

Since the Paired Samples Statistics reveal that the T value for Pair 1 is highest with 77.7 and lowest in Pair 2 with 18.0, further indicating that returns in cash investments were positively correlated with the fund performance, hence, it can be concluded that investments in cash was relatively more important than investments in fixed deposits in the determining the overall performance of the pension funds at 5% significant level. This is attributed to that fact that the period of the review.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is a synthesis of the entire study, and contains summary of research findings, exposition of the findings, commensurate with the objectives, conclusions and recommendations based thereon.

5.2 Summary of Findings

From the analysis of the findings, it was noted that majority of the respondents indicated that the actual weight of the cash in fund had a mean of 0.275 and standard deviation of 0.1531. That is, weight of cash in fund, on average, accounted for 27.5% of the funds returned. The actual weight of fixed deposit in the fund calculated an average of .4604. That is, the weight of fixed deposit explained 46.04% of the funds returned. The actual weight of fixed income in the fund was noted to calculate an average of 0.7907.

The actual weight of government security in the fund had a mean of 0.6303; this indicated that the actual weight of government security explained 63.03% of the fund returns. The mean value for the actual weight of unquoted equities in the fund was calculated to a mean of 0.6424. This implied that the actual weigh of unquoted equities explained 64.24% of the fund returns. This value went as high as 79% and as low as 33%. Regression analysis was utilized to investigate the relationship between the variables.

Generally, the correlation matrix implies that the independent variables: the actual weight of cash in the fund, actual weight of fixed deposit in the fund, actual weight of fixed income in the fund, actual weight of Government security in the fund, actual weight of quoted equities in the fund, actual weight of unquoted equities in the fund, actual weight of offshore investment in the fund and actual weight of immovable property in the fund are significantly correlated and that there is no autocorrelation between the independent variables between the independent variables taken into account.

The multiple linear regression models indicate that all the independent variables have positive coefficient. The regression results above reveal that there is a positive relationship between dependent variable (Fund returns) and independent variables. From the findings, one unit change in actual weight of cash in funds results in 0.077 units increase in fund returns. one unit change in actual weight of fixed deposit in the fund results in 0.053 units increase in fund returns one actual weight of fixed income in the fund results in 0.046 units increase in fund returns one unit change in government security in fund results in 0.047 units increase in fund returns. The study noted that the most important variables were immovable property in fund, quoted equities in fund, offshore investment in fund, unquoted equities in fund, cash in fund, government securities in fund, fixed income in fund and fixed deposits in fund and fixed deposit in fund.

5.3: Conclusion

According to the study findings, low volatility is associated with potential low returns while the vice versa is also true. The researcher noted that the asset allocation for retirement savings consists of a wide range of assets including cash, bonds, property and equities (shares), whose overall impact was to have a medium risk portfolio. The study established that Cash and money

market instruments such as T-bills and commercial paper are most liquid assets, and real estate is among the most illiquid. The study noted that Liquid assets tend to have lower rates of returns than the less illiquid assets.

The study concluded that Liquid assets tend to have lower rates of returns than the less illiquid assets. Therefore fund managers should strike a balance between liquidity and desired returns by establishing the minimum level of liquid assets they wish to hold in the investment portfolio.

5.4: Limitations

The study was only conducted on pension funds in Kenya and this may not provide a full proof on assessment of asset allocation. The study relied on both secondary data and for the analysis. Time was also noted to be a hindrance to acquiring all the relevant data relating to the study. The time available to investigate the research problem and to measure change or stability within the sample was constrained by the due date of the study. More time would have been preferred for the study so as to get a comprehensive analysis of the impacts of asset allocation on financial performance of pension funds in Kenya.

5.5: Recommendations

The study sought to establish the impact of asset allocation on financial performance of pension funds. Fund managers should strike a balance between liquidity and desired returns by establishing the minimum level of liquid assets they wish to hold in the investment portfolio. Professional investors who manage other people's money should restrict investment to assets that would have been approved by a prudent investor.

5.6: Recommendations for further research

The study majorly considered the impact of asset allocation on financial performance of pension funds in Kenya. Further studies should be carried to establish the effect of asset allocations on other employee contributions so as to get a comprehensive analysis of the effects of asset allocation.

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APPENDIX II

INVESTMENT GUIDELINES

INVESTMENT CLASS	MAXIMUM (%)
Cash	5
Fixed deposit	30
Fixed Income (Private)	30
Government Securities	70
Quoted Equity	70
Unquoted Equity	5
Offshore Investments	15
Immovable Property	30
Guaranteed Funds	100
Other Investments	5

Allowance for temporary violations of the maximum: