

**EFFECT OF FUND SIZE ON THE FINANCIAL PERFORMANCE
OF PENSION FUNDS IN KENYA**

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

The performance of pension schemes is imperative as they play a very significant role in the economy of any country. Over the past year pension reforms have been carried out that have brought in different pension schemes with different fund size. The present study thus did attempt to analyze the effect of fund size on the financial performance of pension fund in Kenya. Specifically the study determined the effect of density of contribution, cumulative assets, retirement age, costs and size of membership on the financial performance of pension fund. The study was conducted through the use of a descriptive survey design. The target population for the study comprised all the 1232 registered pension schemes in Kenya as per the Retirement Benefits Authority (RBA, 2014). A sample size of 93 registered pension schemes was selected for the study through purposive sampling. The study used secondary data, which was quantitative in nature and was collected from the annual financial statements of the pension schemes in the custody of the Fund Managers, Scheme Trustees, Scheme Administrators and RBA as filed returns. The data collected was for the period 2011-2015. The quantitative data collected was analyzed by the use of random effect model and correlation analysis. The data was presented through tables, frequencies, charts and graphs. The study found out that administration expenses, investment expenses, pension contribution and accumulated fund assets all have a significant effect on the financial performance of pension fund in Kenya. This was indicated by p-values of 0.04, 0.000, 0.000 and 0.019 respectively. Number of active members and Exit age was determined to have no significant effect on the financial performance of pension funds. This was indicated with p-values of 0.843 and 0.413 respectively. The study concludes that pension contribution, costs and accumulated fund assets significantly affect the financial performance of pension funds. The study thus recommends the need to have more family size pension funds, the need for pension schemes to embrace more cost effective measures and the need for development of new contribution models.

Key Words: Performance, Fund Size, Pension Fund

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DEDICATION

This project is dedicated to my unborn child, my loving wife and family for all the support and encouragement they accorded me towards making this research project a success.

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ACRONYMS AND ABBREVIATIONS

DB: Defined Benefit

EBRI: Employee Benefit Research Institute

GDP: Gross domestic product

Gok: Government of Kenya

NSSF: National Social Security Fund

OECD: Organization for Economic Co-operation and Development

RBA: Retirement Benefit Authority

DEFINITION OF TERMS

Pension Fund: This is a public or private *fund*, or scheme which provides retirement income to beneficiaries (Bauer *et al*, 2010)

Density of Contribution: This is the total contribution by the members to a pension scheme. (Bauer *et al*, 2010)

Financial Performance: measure of how well a firm is doing; case in point on how a pension scheme can use assets from its primary mode of business and generate profits (Cheong (2007))

Fund size: The total market value of the securities in a pension fund portfolio (Cheong (2007))

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In the recent past, the pension fund has gained popularity globally, thus leading to an exponential growth and establishment in most countries. Consequently, the performance and management of the fund is on the spotlight. Statistical evidence demonstrates a rapid growth of pension funds in developed and developing countries. By 2001, pension funds accounted for 45% of the G7's GDP (Chatterton *et al.*, 2010). In the same period, pension funds contributed 20% of the third world's GDP. According to Antolín and Stewart (2009), the enormous contribution in developing nation's GDP resulted from changes demographic characteristics. Chatterton *et al.* (2010) state that pension fund complements capital market and steers a country's growth by providing capital for investment projects. In addition, the investment of pension funds benefits individuals and the economy, especially investment banks. Therefore, pension funds should be properly monitored to prevent them from short and long term benchmarks. Meng & Pfau (2010) contend that the important role of the fund on the country's growth and performance has attracted scholars, practitioners and policy makers to monitor the pension's performance.

According to Antolín and Stewart (2009), various factors such as fund age, density of contribution, retirement age, and total accumulated size affect the performance of pension fund. Recently created funds benefit from established funds, thus lowering various costs. However, Annaert *et al.* (2003) argue that there is no correlation between performance and fund age. Density of contributions also affects performance of pension benefits especially in countries with large informal sectors. The larger the contribution, the more money is injected into the economy

and other projects funded by the pension. Additionally, retirement age affects performance of pension funds since retirement age affects retirement incomes of members. In addition, total accumulated size affects performance of the fund. According to Meng & Pfau (2010) accumulated size of the fund is associated with economies of scale, thus larger funds are more efficient. However, other researchers argue that fund size affects pension's performance differently depending on the fund category. Nonetheless, other scholars contend that there is no correlation between pension performance and accumulated fund size. Besides, administrative and investment costs affect transaction costs of pension funds and thereby influence the performance of pension funds (Chatterton *et al.*, 2010).

A number of Scholars have researched on the relationship between size and the performance of pension fund with Cicotello and Grant (1996); Droms and Walker (2001); , Gallagher and Martin (2005) establishing a negative relationship. Cheong 2007; Mahon and Donohoe 2006; Bikker and Dreu (2009) have on the other side established positive relationship with arguments that that larger pension funds can achieve numerous benefits brought about by economies of scale in administration (Cheong 2007). Different studies have indicated varying relationships with due to reason that can be related to costs, retirement age, contributions and asset size. Thus it is necessary to establish the effect of fund size on performance of pension fund in Kenya.

1.1.1 Financial Performance

Financial performance according to Cheong (2007) is a subjective measure of how well a firm is doing. For example, a pension scheme can improve its financial performance by using its assets to generate profit. Brady (2009) suggests that financial reports offer valuable information about

the performance of pension schemes to interested parties such as employees and retirees of a firm. Financial performance is an essential aspect in determining net income and assessing the financial risk of a firm. Moreover, a pension scheme's financial status can affect the financial welfare of its members during their retirement years. To account for defined benefit pension plans, pension schemes need to make many estimates. These estimates according to Blome et al. (2010) include prediction of future salary increment for covered employees, the discount rate to be used in determining the value of pension payments and the return on assets accumulated in the pension fund.

One way of determining the financial performance of pension schemes is by use of ratios. According to Gallagher and Martin (2009), ratios are defined as association between two financial balances or calculations. Examples of these include Liquidity, Leverage Asset Management, Profitability and Market Value ratios. This study focuses particularly on Profitability Ratios including Profit Margin, Return on Equity and Return on Assets. These profitability ratios are used to measure the earning's level of pension schemes in comparison to a base, such as capital, sales or assets. ROE (Return on Equity) refers to a measure of how well the management has utilized the capital invested by shareholders (Brunner et al., 2008). Brunner et al. (2008) also defines Return on Assets (ROA) as the measure of the net income returned on each shilling of assets and Profit Margin as a measure of profit percentage generated for each shilling of sales. This study focuses on investment performance particularly returns on investments. This choice is informed by the researcher's opinion that the difficulties experienced by pension plans are only partially attributable to the performance of stock markets. More important is the poor choice of benchmarks used in risk and investment performance control.

1.1.2 Fund Size

Pension Fund Size is a key determinant of pension fund performance. Pension fund size has been measured into different ways and these include; pension contribution, number of active members and pension assets. Pension Fund assets are the common way of estimating fund size and thus pension fund assets are therefore long-term assets which arise from the pension contributions made by members towards their retirement. These assets are therefore not easily converted into cash and are mostly liquidated only in the case of a withdrawal by a retiree when it falls due. Preliminary data and early estimates for 2014 show that pension funds' assets exceeded USD 25 trillion in OECD countries (OECD, 2015).

In all the OECD countries except Poland, pension funds' assets grew between the end of 2013 and the end of 2014. The largest increases are found in Estonia, Korea, Luxembourg and Turkey where pension funds' assets rose by more than 20%, compared to their levels in December 2013. The five biggest countries in the OECD area in terms of pension funds' assets were the United States, the United Kingdom, Australia, Canada and the Netherlands, altogether totalling USD 21.7 trillion or more than 85% of OECD pension funds' assets. Kenyan Pension Industry assets stood at Kshs.788.15 billion as of December 31st 2014. With a growth of 5.1% from 2013, with the amount composed of the Kshs.681.29 billion held by the fund managers and insurance issuers, Kshs.61.83 billion internally administered by National Social Security Fund (NSSF) and an additional Kshs.45.02 billion of property investments directly managed by scheme trustees. The assets under fund management included Kshs.79.6 billion of NSSF funds externally managed by the 6 contracted managers (OECD, 2015).

1.1.3 Pension Funds in Kenya

The Kenyan Retirement Benefit Scheme first came into being after independence in 1965 and was dubbed the National Social Security Fund (NSSF). In the earlier Kenyan Retirement Benefit Scheme systems before reforms were done to the sector, the retirement benefit scheme fund system provided for benefits once a worker retired on attaining the mandatory retirement age of 55 (RBA, 2006). The guarantee was fixed as the worker's full basic salary throughout his life or that of the widow as the law did not imagine a situation where the wife would support the husband (NSSF Act); Pensions Act (Cap 189). RBA has been the regulatory arm of government that is tasked to regulate the Kenyan Retirement Benefit Scheme fund system since 2000. The Kenyan Retirement Benefit Scheme fund system has four components: NSSF; Civil Servants Pension Scheme (CSPS); Occupational Retirement Schemes (ORS); Individual Retirement Schemes.

NSSF is a public provident fund (pays benefits as a lump sum) that covers an estimate of 800,000 members in both the formal and informal sectors. Contributions to NSSF are mandatory for employees in firms with 5 or more employees, whereby members contribute 5% of their monthly earnings. In a bid to accumulate retirement savings for their employees, ORS were established, in Kenya ORS are operated on Defined contribution which is not mandatory for employers to set up and once established it falls under the mandate of the Retirement Benefits Authority. The ORS are estimated to cover an estimated 3% of the working population in Kenya (RBA, 2008).

Civil servants pension schemes for the civil servants, judiciary employees, military personnel, armed forces, teachers and parliamentarians and CSPS provides benefits including old

age pension, injury and compensation, survival benefits, dependency pension for 5 years after death of a pensioner, disability pension (military only) and gratuities in the form of lump sums. The CSPS had 125 000 members by December 2006 (Kakwani et al, 2006).

The Individual Retirement Schemes (IRS) are run by financial institutions, for the Kenyan case mainly by insurance companies which provide an avenue for saving where employers do not have their own schemes, and for workers who wish to make additional voluntary contributions; as at close of 2009, RBA had registered 21 IRS that covered an estimated 2% of the working population (RBA, 2009). IRS filled the gaps where the number of employees is so dismal to form an ORS that would render it not being financially viable owing to the small membership (RBA, 2009).

1.2 Problem Statement

Pension fund performance has received increased attention across the world with public pension fund performing dismally when compared to private pension fund. Pension fund performance has thus given mixed results in different countries, with OECD countries recording positive real net investment returns in 2014, ranging from 1.2% in the Czech Republic to 16.7% in Denmark, with an OECD weighted average of 5.0% . However, the same is not said of non-OECD countries, with majority showing negative returns in 2014. These include Armenia, Nigeria among other countries in sub-Saharan Africa (Andonov, 2014). Performance of the pension funds in Kenya has largely mirrored that of the Nairobi Securities Exchange which has been on the decline, with pension results for 2014 showing a decline to average pension return of 15.5%. Financial performance for most pension schemes have posted negative performance. Pension

fund have exhibited varied results, with different factors such as fund size impacting on the performance of pension fund (RBA, 2015).

The relationship between fund size and performance of pension fund has gained interest over the past years with some pointing out that there are advantages to fund size such as more resources for research and lower expense ratios Fredman and Wiles (1998). Others believe that a large fund size base erodes fund performance because of trading costs associated with liquidity (see, e.g., Lowenstein (1997)). However, even with studies on fund size and performance the question of relationship is still inconclusive in developing countries as well as developed countries (Simbabrashe et al, 2014).

Studies on the relationship between pension fund size and pension fund performance have been carried out. Internationally studies have been carried out by Mahieu (2010) who carried out a performance on performance of Dutch pension fund. This study used fund age, fund design and retirement as variables of the study. Robu & Sandu (2011) carried out a study on correlation of fund size and performance of private pension funds, with the study focusing on fund age and retirement as the variables of the study.

Regionally studies have been carried out by Simbabrashe & Nyamwanz (2011) in Zimbabwe on effect on fund size on pension fund efficiency. This study focused on pension fund size effect on pension fund efficiency, albeit with the use of primary data. Locally, study by Oluoch (2013) focused on determinants of pension fund performance in Kenya through primary data, one such determinant tested was fund size. However, the aforementioned studies that have been carried out are on private pension fund, public pension fund in Europe with the remaining studies on pension fund focused on use of primary data. This leaves a gap on studies focused on

fund size and pension performance thus necessitating this study that will focus on effect of fund size on performance of pension funds.

1.3 General Objective

The general objective of the study was to:

To determine the effect of fund size on performance of pension funds in Kenya

1.3.1 Specific Objectives

1. To determine the effect of contribution density on the performance of pension funds in Kenya.
2. To determine the effect of accumulated fund size on the performance of pension funds in Kenya.
3. To determine the effect of number of member on the performance of pension funds in Kenya.
4. To determine the effect of administration costs on the performance of pension funds in Kenya.
5. To determine the effect of investment costs on the performance of pension funds in Kenya.
6. To determine the controlling effect of exit age on performance of pension funds in Kenya.

1.3.2 Research Questions

- a) How does contribution density affect the financial performance of pension funds in Kenya
- b) How does accumulated fund asset affect the financial performance of pension funds in Kenya

- c) How does the number of members affect the financial performance of pension funds in Kenya
- d) How does cost of members affect the financial performance of pension funds in Kenya?
- e) How does controlling effect of exit age affect the financial performance of pension funds in Kenya?

1.4 Significance of the Study

1.4.1 Contribution to body of Knowledge

The study will be useful to the improving the body of knowledge on performance management, with specific improvement on pension fund performance in developing countries that there has been a dearth of information unlike developed countries. The findings of the study will also contribute to the body of knowledge on effect of fund characteristics on performance of pension fund and thus stocking more interest in developing countries. This is because there is no clear established relationship on effect of fund size on pension fund performance. Overall, the study will contribute to theory and practice in the following way. Through the documentation of the study findings useful information will be provided to fund managers that may disregard their choice and accept the default option when it comes to selecting a pension fund. The study through its findings which may be similar or not from other markets may allow the regulators to see the pros and cons of bigger or small fund size thus allowing regulators and fund managers to reduce decision mistakes that they may commit thus lowering the performance of pension fund.

The findings of this study will be helpful to the regulator as it will contribute towards the formulation of better polices that will be relevant towards supporting good investment decision and better returns for pension funds. Secondly, through the study board of trustees will be able to

analyse the impact of fund size on pension fund performance thus taking decisions that will improve the financial performance of pension funds. Finally the study will help the fund managers enlighten members through the study findings on how fund size can help improve personal benefits.

1.5 Scope of the Study

The study focused on the effect of fund size on performance of pension funds in Kenya, with a focus on the following aspects of fund size; accumulate fund assets and beneficiary contribution. The study used secondary data for the period 2011-2015 and was narrowed down to 93 pension schemes.

1.6 Limitation of the Study

The study faced the following limitations:

A major limitation that the study faced was the lack of complete data sets from most of the pension schemes thereby increasing the error bias of the study.

1.7 Assumption of the Study

The assumptions of the study were as follows:

- a) Capital markets are efficient
- b) Defined benefit design always have an effect on pension fund performance.

CHAPTER TWO

LITERATURE

2.1 Introduction

This chapter provides a general review of the available literature pertinent to the study problem. It delves into the theoretical framework guiding the study; fund size, retirement age, density of contribution, Number of Members, Cumulative assets, empirical literature and a summary of the literature review.

2.2 Theoretical Framework

This section reviews the theories of the study which will be Stakeholder theory and Theory of Constraints as pertinent to the assessment of the determinants of financial performance of pension schemes in Kenya.

2.2.1 Financial Intermediation Theory

The theory regarding financial intermediation was developed starting with the 60's and can be traced to the work of Gurley and Shaw (1960). The financial intermediation theory is based on the theory of informational asymmetry and the agency theory. In principle, the theory state that institutions exists to reduce information and transaction costs that arise from an information asymmetry between borrowers and lenders. In a financial context, the phrase 'financial intermediary' refers to an individual, institution or a company firm that conducts intermediation between two entities or more and pension fund been one of them (Allen & Santomero, 1998). Pension Funds receives larger flows of savings in comparison to other institutional saving

because many beneficiaries regard it highly. Fiscal provisions of such a nature tend to increase the demand for saving through the channel of pension funds. Furthermore, the pension funds' growth usually depends on the liberality of corporate social security pensions especially for particular benefit funds. There are additional aspects of the association between the fund and public sponsor that motivates firms to establish pension funds. Based on the perception of corporate finance, liabilities of defined benefit pension fund are considered as corporate debt that members can claim from the firm like other creditors. Fund investments, according to this perception are corporate assets that make the pension obligation collateral (Scholtens, 2003).

Based on the theory of financial intermediation that primarily focuses on banks, activities such as deposit taking and loan issuance define the role of financial intermediary. The expansion of the financial intermediation theory to activities of pension funds activities by Davis (2000) considers pension funds as types of institutional investor, that pool, save and invest money contributed by beneficiaries and sponsors to cater for the beneficiaries' pension entitlements in the future. Accordingly, the financial intermediary role is met by pension funds through investment of accumulated money into various financial assets such as government bonds, deposits, corporate equities, foreign instruments, corporate debt, and real estate. As financial investors, pension funds could offer several advantages including improved risk trade-off of, better return as a result of diversification and reduced costs of transaction following the large volumes of trade (economies of scale). Characteristics such as costs of transaction and asymmetric information in the real-world market enable pension funds to benefit from fixed costs of assets evaluation, technological advances and decreasing average trading costs (Robu and Sandu, 2011). Thus the theory of financial intermediation will contribute to the study by

providing an understanding to the role of fund size in financial performance of Pension Funds in Kenya.

2.2.2 Modern Portfolio Theory

The history of modern portfolio management (also known as modern portfolio theory (MPT)), originates with Markowitz (1952, 1959). MPT foundation was hinged on the following concepts: risk return trade-off, correlations in returns of different assets, portfolio selection and investment optimization. MPT main aim is in providing the best combination that will provide the best combination of portfolio that maximizes returns for a given amount of risks. The risk of an asset is measured as the variance of the return on that asset, where variance is a measure of how returns can deviate from their expected value. The portfolio's return variance then is the sum over all assets of the square of the fraction held in a specific asset (weight) times the asset's return variance.

MPT is based on a number of critical assumptions that focus on behaviour of individuals, which are used to imply to the behaviour of institutions. First, that the investor is rational. MPT's second assumption is that there is risk averseness among investors in making decisions about their maximum expected utility that will give higher returns with low overall risk. A third assumption of MPT is preference for portfolio with high expected returns over portfolio with low expected return. A fourth assumption is that investors are price takers who cannot affect a security price, which in most cases aligns to large institutional investors. A fifth assumption is that the investor is knowledgeable about expected return in his portfolio. Thus, taking these assumption MPT plays a crucial role in determining the performance of the existing portfolios in

pension funds, and is of importance in the financial performance of pension funds that is based on returns of investments.

2.2.3 Efficient Market Hypothesis Theory

The efficient market hypothesis is a widely used and accepted concept in the finance studies. It relays that at any point of time all available information is contained in the price of securities and thus the search for any new information that is not available in the “current price” is thus a waste of time. The theory also argues that active investment management is needless and thus an investor focus should be on utilizing the market index in determining the investment strategy that an investor will pursue (Malkiel, 2003). Performance evaluation of pension funds has long been associated with the question of market efficiency as originally presented by Fama (1970). Based on the theory markets are information ally efficient, and thus would not generate excess returns from the historical data. This is for the reason that all securities prices reflect publically available information (Cochrane, 1999. This is of importance in understanding the performance of pension funds market since they are related to the performance of security markets. As such it is expected that any investment that pension fund make is related to the available public information and this will not lead to abnormal performance (Malkiel (2005). Efficient market theory will thus be of help in understanding the financial performance of pension funds given the public available information on the various pension fund sizes.

2.3 Empirical Review

2.3.1 Pension Fund Size and Performance of Pension Funds

Research literature points to a positive relationship between fund size and fund performance (Bikker and Dreu, 2009; Mahon and Donohoe 2006; Ahmad 2009). Studies by (Gallagher and Martin 2005) have indicated that the bigger the pension fund the better the performance of the fund while study by Chan et al (2004) found no association between the fund size and performance. Thus there is still lack of clarity on the relationship between pension fund and pension fund size.

The issues of economic and efficient administration of pension funds and its relation to size were first documented in Caswell (1976). According to Caswell (1976), pension funds in the construction industry experienced economies of scale that were related to their size. Caswell (1976) defined economic efficiency as consisting of the achievement of predetermined objectives with a minimum expenditure of resources. Economies of scale are defined as the relationship between changes in the physical units of output and monetary costs associated with the inputs. Pension funds should operate at the appropriate scale; not too big, not too small (Caswell, 1976).

According to Mahon and Donohoe (2006), significant economies of scale exist in pension fund administration. They suggest that smaller pension funds bear excessive operating costs per participant since many of their expenses are fixed. The most important factor affecting pension fund costs therefore is size determined on the basis of the number of members in the pension funds (Mahon and Donohoe, 2006). Recognizing the dramatic effects that pension fund size can have on performance, the Irish Funds Industry Association (2009), cited in Mahon and Donohoe (2006), urges small pension funds to pool their assets. According to the association, pension

pooling would allow pension funds to “pool” assets into a single investment vehicle that would invest in assets, such as global equities, bonds and cash on behalf of the investing pension funds. This mean that the bigger the pension fund size the lower the costs that it’s likely to incur thus increasing pension fund returns.

The argument that pension fund sizes lowers costs has been championed in Nigeria where small pension funds were merged together to form larger pension funds, with the results been improved pension performance in Nigeria (Ahmad, 2009). Through these mergers, large pension funds were created which resulted in lower average transaction costs and custodial fees for the investors. Vitas *et al.* (2008), observed that large pension funds enjoy the benefit of low operating costs because they avoid large marketing costs. These economies may however be eroded by poor investment performance.

Ardon (2006) in a study carried out in Massachusetts established that smaller pension systems had higher costs associated with their administration and management. The smaller funds recorded administrative costs equal to 0.78% of their asset values whilst the bigger funds recorded administrative costs of 0.44% of the asset values (Ardon, 2006). Very small pension funds are therefore uneconomical to operate and will result in low levels of efficiency. Faktum (2009) found that Danish pension companies are the lowest cost operators in the OECD countries since the pension funds operate at ideal sizes “not too big, not too small.”

On the other hand studies in South African by Milburn-Pyle (2004) and Nurse (20088) concluded that a fund’s size had no effect on its performance. Milburn-Pyle (2004) in a study that focused on analysing the yearly investment yields (yearly rates of return) of both private pension

funds against fund size over a period of 10 years concluded that there was no significant correlation between the fund's mean asset size and its investment yield. Nurse (20088) also investigated the effect of size on the risk-adjusted performance of unit trusts. Through the use of capital asset pricing model analysis he inferred that there is no statistically significant correlation existed between the fund's return rate and the fund size. Thereby concluding that fund size cannot be used to predict the financial returns of pension funds.

The primary function of a pension fund is to invest the accumulated pension contributions as appropriately and optimally as possible whilst adhering to the legal regulations. The Danish pension fund sector manages a large amount of capital in terms of pension contributions which corresponded to 43, 20% of the Danish GDP in 2009 (OECD Statistics, 2011). The study also observed that the pension fund sector is responsible for managing the pension contributors' wealth which is a great responsibility and it might not always be handled in an appropriate way seen from the pension contributors' point of view. Over time, this has led to a tightening of the legislation restricting the freedom of movement of the pension funds with regards to their investment strategies.

In his study on factors determining performance of pension funds in Kenya, Oluoch, (2013) notes that the relationship between fund value and returns among pension funds in Kenya is not very strong. Therefore, improving the value of pension funds cannot be used as leverage for higher profitability. In addition, improvement of fund value does not necessarily translate into higher returns. Furthermore, Oluoch (2013) observes that the relationship between assets and returns is weak, thus the assets acquired by the pension schemes do not translate into higher

returns. However, a strong relationship between assets and returns would imply that the assets available in the pension funds are used to generate income for the benefit of the contributors.

2.3.2 Density of Contribution and Performance of Pension Funds

The density of contributions that pension funds receive from the contributors is also a very important determinant of their performance. If a fund has many contributors who are capable of channelling huge funds to the scheme, then there will be enough funds to invest and this will assist the fund to earn better revenues. The reverse is also likely to happen if the amounts of contributions received from the contributors are not large enough to enable the fund to enter into any meaningful asset investment (Bodie et al., 2009). The average amount of contribution during the year will be used as the measurement.

The density of contribution is the ratio of the count of effective to potential months of contribution. The individual must be alive, not retired (though not necessarily active) and no younger than 18 years old for a month to be considered as a potential month of contribution. The density of contributions is one of the most widely used indicators of contributions performance. It measures the proportion of months that a worker contributed over the potential months he could have contributed within a certain age range. Analysts are usually interested in the density of contributions conditional on not being retired (Robalino and David, 2005).

The average amount of contribution that a pension scheme collects from members are often based on compulsory or defined contributions that given groups makers to the scheme with the objective of getting their post-retirement benefits. Studies in South America by Solange et al (2006) and Marisa et al (2006) showed that that the ability of pension schemes to protect the

resources of members and guarantee a steady post retirement income is a major determinate to the density of contribution that pension funds will have.

The density of contributions that pension funds receive from the contributors is also a very important determinant of their performance. If a fund has many contributors who are capable of channeling huge funds to the scheme, then there will be large funds to invest and this will assist the fund to earn better revenues. The reverse is also likely to happen if the amounts of contributions received from the contributors are not large enough to enable the fund to enter into any meaningful asset investment (Bodie et al., 2009).

In a study by Forteza et al(2011) in South America it was established that density of contributions are particularly low at early ages with the average densities ranging between 20 to 39 in Chile, Uruguay and Argentina. As expected, densities increase as workers mature with mature workers contributing twice as early workers to their pension plan schemes. The study also established that density of contribution negatively correlate with income levels, with the study proving that low contributions are related with low income earners and high contributions with high income earners.

In another study carried out in Jordan Forteza and Mussio (2012) it was established that workers contribute on average about one third of their working life., with the study finding out that there is no gender difference between men and women. The densities of contribution in Jordan were established to be considerably smaller than densities reported in the Latin American countries for which similar analysis have been conducted (Argentina, Chile and Uruguay).

Similarly the study found out that low contribution corresponds to those with low income levels and having no incomes (Gill et al, 2003).

Density of contributions is also an important factor that has affected the pension benefits in countries with large informal sectors. Individuals with a low density of contributions are likely to face low accumulated assets at retirement age, and therefore are likely to have low retirement incomes (Bodie et al, 2009). For any given rate of turnover between covered jobs and other uses of time, average density falls when self-employment and informal employment expands and when activity outside the labor force (mainly home production) rises. Density may also change for a different reason: underreporting of earnings, keeping the headcount constant.

Simbabrashe et al (2013) conducted an empirical study on the efficiency of pension schemes in Zimbabwe in the post multicurrency era from 2010 to 2013. The research was based on quantitative data such as portfolio returns of pension funds and their asset sizes. The research sample was 20 standalone pension funds and 9 fund administered pension funds using a cluster sample. Based on the data presented on Zimbabwean pension fund, the analysis demonstrated that there was no relationship between the density of contribution and its investment performance. Therefore, the study established that density of contribution alone does not determine the performance of a pension.

2.3.3 Retirement Age of Contributors and Performance of Pension Funds

The existence of pension funds can be traced back to the colonial days when the colonial governments introduced the social welfare programs. In recent years there has been a great transformation of the pension funds as well as major growth across the globe. The main reason

why pension funds exist is to provide some form of social security to people who retire from active employment. The pension fund is aimed at providing some income that will enable retired people to meet their needs even in retirement. Therefore, pension schemes are part and parcel of a social security plan designed to protect beneficiaries from financial impairment once they retire from active employment (Lungu, 2009).

Augusztinovics (2002) states that the ageing of the population is a process that is cyclical rather than continuous. The current ageing crisis in the country is attributed to three major factors: the number of births in the 1950s; the “baby boom”; and its echo in the late 1970s. These factors have resulted in oscillations in the world's population age structure and forced policymakers to address age demographics in an attempt to improve efficiency of pension funds (Augusztinovics 2002).

Whelan (2005) and Davis & Hu (2005) assert that extended life expectancies and lower fertility rates forced pension schemes to rethink their investment plans. While pension schemes with younger members are inclined to invest more in equities and more risky assets, funds with older members tend to invest more in guaranteed funds and fixed return securities (Whelan, 2005). Therefore, the age of pension scheme members influences the scheme's investment plan and levels of performance. In addition, young members in a pension scheme consider saving for retirement a long-term venture, thus they do not take it seriously.

In the last decades, demographic changes such as life expectancy increased and decline in rate of population growth highly influenced formulation of pension funds policies. These two demographic changes resulted in questioning the intergenerational fairness and effectiveness of

the pay-as-you-go pension system. According to Hagemann and Nicoletti (1989), future workers will be greatly affected by the significant decline in fertility and by extension decline in population growth rate as well as pay-as-you-go financing. Accordingly, the contribution rates of future workers must be increased in order to keep the same rate of retirement benefits to current wages. Kifmann and Schindler (2000) argue that when growth declines, the contribution for earlier generations must be increased and the contribution rate should be generation specific. In addition, they investigated how to smooth the implicit taxes when there is an increase in life expectancy. Furthermore, Kifmann and Schindler (2000) observe that an increase in life expectancy increases the contribution rate and thus calls for an adjustment in the replacement rate. It was also noted that when a policy holds a fixed contribution rate, they will not be able to smooth implicit taxes. Additionally, Kifmann and Schindler (2000) note that when no funding elements are employed, the implicit tax rate can be smoothed, but the contribution rate fluctuate and will possibly not converge to a steady level. Moreover, when introducing a partial funding element the implicit tax rate can be smoothed with a stable contribution rate and replacement rate.

Rabikauskaitė and Novickytė (2015) conducted a study to analyze the effect of fund size on government pension schemes over 20 years, with retirement age used as control variable. This study aimed at assessing the second pillar pension fund performance and how fund differences are affected by the exit age of pensioners. It was found that fund return was found to have reduced for pension schemes with early exit age. Thus the study concluded that retirement age has a significant control effect on pension fund performance, with difference been as high or low for private and public pension funds by 30%

Petraki (2012) conducted a study in one of the leading pension industries in the world to investigate the performance of personal pension funds in the UK. The research identified two significant factors that are usually overlooked in the related literature: fund's age and management outsourcing. The outcome demonstrated that risk-adjusted returns are statistically insignificantly different from zero but funds significantly outperform their benchmarks. Petraki (2012) observed that performance changes with fund's age as a control variable. However, the relationship was shown to be more complex with the effect varying for both private and public pension funds. Risk-adjusted returns of the internally managed and the outsourced funds were both indifferent from zero but the outsourced funds are better at outperforming their benchmarks.

Gupta (2012) in a study examining various segments of the managed funds, sought to determine if there is any significant difference on how assets are allocated into various asset categories and if investors make their investment decisions based on the past performance of the fund. The research used a panel regression model to test the relationship between flows and past excess returns. The study established that there is a significant difference in asset allocation between the wholesale and retail and segment. Retail investors prefer investments that are less risky compared to wholesale investors and they have lower preference investing overseas. The results showed that past performance of funds influence investment decisions, with the retail section demonstrating a higher level of influence as compared to the wholesale segment. In addition, the outcomes show statistically the relationship between the fund size and the net cash flows is negative. Gupta (2012) states that the cause of this negative relationship is that when funds grow, they do not increase the quantity of assets in the portfolio and this may result in less

than optimal allocation of funds. The result implies that investors, especially retail investors, should be considering the size of the fund as a factor when they choose a fund.

Bikker et al, (2009) in a study that examined the effect of fund asset allocation on pension fund performance in Netherland. The study focused on both private and public pension funds in Netherlands and used t exit age as a control for to test the effect of fund asset allocation on fund performance. The study found out that an increase in exit age of members contributed to pension fund performance for private pension funds while reducing the fund performance for private pension funds.

2.3.4 Costs and Pension Fund Performance

Various scholars agree that pension costs can significantly erode retirement assets (Bateman & Mitchell, 2004; Bikker & De Dreu, 2009; UK Pensions Commission, 2005). Although the pension fund costs may determine the development of scheme assets throughout the year, the short term impact is not the critical factor. However, Bateman and Mitchell (2004) argue that the cumulative effect of annual costs during the lifetime of a scheme on the final fund value is the critical factor that determines the development of a scheme.

There are different ways of levying Pension scheme costs. These various methods of levying reflect the pattern of pension scheme cost structures in other parts of the world as revealed by a research conducted on pension scheme costs in thirteen countries, (Whitehouse, 2010). Pension scheme costs may be fixed, levied for each transaction or a combination of both methods. In addition, the levying mechanisms can also be explicit or implicit. Furthermore, the pension funds may also be taxed lump sum amount or a stretched fee over their lifetime.

Besides, pension funds may receive cost discounts based fund size or transaction volume. Furthermore, the pension schemes of bigger financial institutions may profit from cross subsidies. For instance, the sponsoring company may benefit if it also offers investment management services to its pension scheme without charging on an ad-hoc basis or levying at full rates. The above discussed factors can make it difficult to estimate pension fund management and administration costs.

In addition, investment costs influence the performance of retirement fund significantly. Moreover, high costs of pension investment affect the beneficiaries' wealth significantly because they reduce the net rates of return on investments and, therefore, increase the costs of providing pensions. The current financial crisis and the increase of the elderly population have created significant challenges globally. Consequently, politicians and the public increasingly demand transparency and efficiency in the operation of pension funds.

Although investment costs have a significant influence on the performance of pension funds, empirical studies on cost structures of pension schemes are few. The absence of such studies can be attributed to the lack of detailed, unbiased and comparable data on investment costs. A majority of the studies on the subject have concluded that the link between costs and size of pension funds is negative. However, most of the researchers such as Bikker & De Dreu (2009) and Bauer et al. (2010) have focused mainly on U.S. pension schemes investment costs and total investment cost levels respectively. As such, empirical studies on investment costs for European pension funds are limited. Typically, the European pension schemes differ from their U.S. counterparts regarding asset allocation or incentive for economies of scale.

Notably, some scholars have conducted research on economies of scale in the cost structures of pension schemes. Bikker and De Dreu (2009) in a study on Dutch pension funds' investments and administrative costs found out that pension schemes have strong economies of scale. Additionally, Bauer, Cremers and Frehen (2010) in a study on domestic equity investments for American pension schemes established that there are economies of scale in investment costs. Andonov, Bauer and Cremers (2011) also concluded that the effect of investment costs on performance differs across asset classes. According to Andonov et al. (2011), the economies of scale result from the greater bargaining power of larger pension funds and the relative advantage of internalization.

The size of pension schemes affects investment costs in different ways. According to Bikker and De Dreu (2009), some investment-related costs increase less proportionally with the pension fund's size. For instance, research and risk management costs may not increase with the increase in pension funds' size. Instead, large pension funds can benefit from economies of scale by spreading these costs over a bigger asset base. In addition, large pension schemes are likely to be charged lesser fees for investment mandates because they have a greater bargaining power (Andonov et al., 2011). Moreover, Dyck and Pomorski (2011) suggest that large pension schemes have greater capability of replacing expensive external asset management with less costly internal management.

2.3.5 Pension Schemes Membership and Pension Fund Performance

The retirement benefits sector in Kenya is composed of NSSF (National Social Security Fund), the civil service scheme, occupational schemes, and personal pension schemes. These schemes have a total workforce coverage rate of about 15%. Of this percentage, 10% (800,000 members)

belong to the NSSF, 3% in the civil service scheme, 1.5% occupational schemes and 0.5% in the individual retirement benefit schemes. The number of actively contributing members is increasing over the years. Similarly, occupational schemes have been growing and assets have reached the current market value of around 33 billion. However, this is not the situation in all African countries. For example, of Botswana's 790,000 workforce, about 300,000 are in private, formal employment but 84% of these employees do not have any occupational pension coverage. Furthermore, around 33% of public sector workforce is not covered. Besides, there is little evidence of supplementary saving in individual products to fill this gap.

In Africa, South Africa is the country with the largest members of pension funds with over 1.2 million active members and about 360 pensioners and beneficiaries. However, just like most pension funds, South Africa pension fund is challenged with reduced cash flow and a decline in active membership. This decline in active scheme membership can have a substantial impact on cash flows and investment strategies because the annual contributions may fail to cater for pension benefits.

2.5 Summary of Literature Review

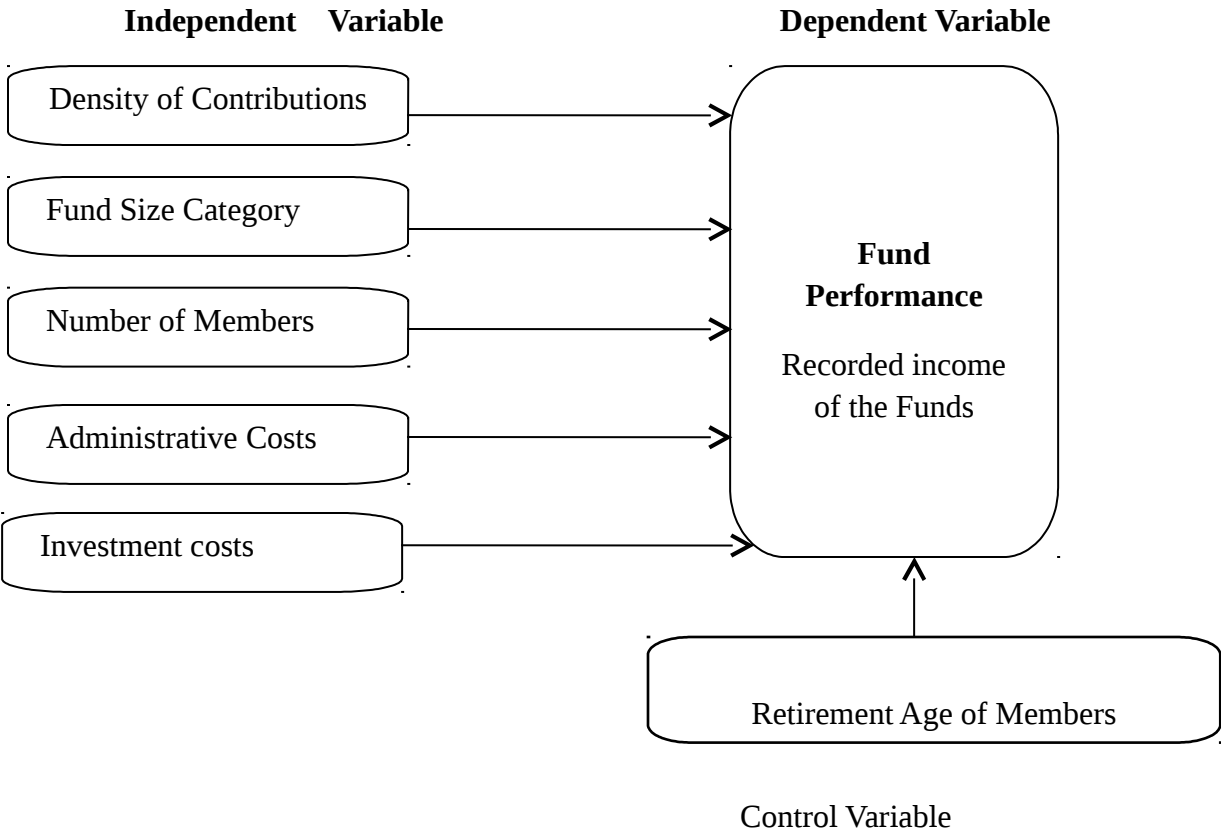
Pension fund performance has been established to be influenced by a variety of factors that includes the fund size, with different studies indicating that the size of the fund is positively related to pension fund performance while other studies showing that size of pension fund is negatively correlated with pension fund performance (Ammann and Zingg, 2008; Lungu (2009).

The reviewed studies indicate that studies which have been carried out have been focused on impact of pension fund size on pension fund performance, with specific focus on the following variable of asset allocation and retirement age. The studies have excluded other

variable and none included controlling variable in the study. Thus there is need for more studies on the impact of fund size on pension fund performance in emerging economies, and with a broad focus on components of fund size.

2.7 Conceptual Framework

FIGURE1
Conceptual Framework



Pension fund performance is determined by both firm factors and external factors. One of the main firm factors affecting the performance of pension fund factors is fund size. Fund size is determined by a number of factors that affect the performance of pension. These factors include

density of contribution and number of members that affect the investment expenses and provide more funds for investments. Retirement age influences the investment decisions of pension fund with pension fund having younger members able to invest more in risky venture than pension fund with old members. Cumulative assets are a major determinant to the returns that pension fund will enjoy with different asset allocation providing different return. In addition the effect of these factors on pension fund performance is controlled by exit age that influence the financial performance of pension funds.

TABLE 1

Operationalization of the Variables

Category of Variables	Variables	Indicator	Level of Measurement	Secondary Source
Independent Variable	Density of Contribution	Amount of contribution in the financial records of pension schemes	Continuous Variable	Recorded contribution in the financial statements of pension schemes
Independent Variable	Administration Costs	Recorded income of the schemes in a year	Continuous Variable	Return on Investment
Independent Variable	Investment Costs	Recorded income of the schemes in a year	Continuous Variable	Return on Investment
Independent Variable	Fund Size Category	Recorded Asset Size at the end of 2015	Continuous Variables	Recorded Asset Size at the end of 2015
Independent Variable	Number of Member	Total number of membership in a year in pension scheme	Continuous Variable	Registered members in pension scheme
Control Variable	Exit Age	Investment and administration	Continuous variable	Financial Statement for Year ending

		costs		
Dependent Variable	Financial Performance	Average age of exit from the labour force for participating workers	Continuous Variable	Average age of exit from the labour force for participating workers

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section defines research methods, research instruments and research tools. It also presents the instruments and tools selected for this study. The chapter further describes the methods and procedures that will be used in collecting relevant data and how it will be analyzed. It presents the research design, type of data, target population, the sample size and sampling procedure, methods of data collection and procedures, techniques of analyzing data and instrument validity.

3.2 Research Design

The present study was conducted through the use of cross-sectional correlation study design. This design enabled the researcher to test the relationship between the study variables over a period of time (Breakwell, Hammond & Fife-Schaw, 1995). The advantage of this type of design is that it allowed for analysis that provided strong findings on cause and effect relationship between variables.

3.3 Population of the Study

The target population for this study was 1264 with these comprise of the following pension funds in Kenya: Occupational Retirement Schemes (ORS), umbrella retirement scheme and Individual Retirement Schemes (RBA, 2015). This is categorized in the following fund sizes

TABLE 2
Pension Schemes in Kenya

Fund Size Category	Number of Pension Schemes
0-300 million	994
301-601 Million	111
601-1 Billion	51
Over 1 Billion	108
Total	1264

3.4 Sample Design

3.4.1 Sample Size Calculation

The sample size of the study will be calculated based on Yamane (1987) method of sample calculation. This is because the sample size is for a small finite population and the population is known.

The following sampling methodology was used:

$$n = \frac{N}{1 + Ne^2}$$

Where N = known population and e = error level, with a 90 confidence interval selected the confidence error will be 10% or equivalent to 0.1. A confidence interval of 90% was selected because the sample size are institutions and not individual and thus sampling size is relatively small. The sample size of the study was 93 pension schemes and this is calculated as follows:

$$n = \frac{1264}{1+1264*0.1^2} = 92.66$$

3.4.2 Sampling Technique

The data on pension schemes according to pension fund sizes will be sourced from Retirement benefit authority (RBA, 2015). The number of schemes in each strata was then used to calculate the proportion of each stratum in the population of schemes. This was Xi, Xii, Xiii and Xiv for fund values.

The population proportion then used to calculate the sample proportion of each fund size category. This is shown in Table 3. Thereafter random sampling was used to select sample pension schemes to be selected for the study in each pension fund size.

TABLE 3
Sample Size

Pension Fund Size Category	Sample Size
0-300 million	73
301-600 million	8
601-1 billion	4
Above 1 Billion	8
Total Sample Size	93

3.5 Data Collection Technique

The study used data that was sourced from the Retirement Benefits Authority (RBA). RBA acquires this data was from 29 Registered Pension Administrators in Kenya on a yearly basis.

The data was for a five year period (2011-2015). This period was selected for the reason that data from past periods were not available and those that were available were unreliable.

3.6 Data Analysis

The data collected was quantitative in nature and continuous data. This data was then be entered in Microsoft Excel and thereafter cleaned through double entre process. The cleaned data set will then be transferred to STATA version 12 from where it was transformed ready for analysis.

3.6.1 Regression model

The study used fixed effects model to test the model relationship. Fixed effects regression model was used because it allows the intercept to vary cross-section ally as it generates a dummy variable for each cross-section; the slope parameter is constant over time and space. The null hypothesis was tested by Hausmann test to establish if fixed model was fit for the study The use of fixed model effect has also been supported by the following pension fund performance studies (Robu & Sandu, 2011; Stewart, Mc, & Nally, 2009).

The study will use regression model as shown below:

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \alpha_i + \mu_{it}$$

Where:

Y= Recorded income of the funds in a year

α = Constant

$\beta_1 - \beta_5$ = Beta coefficients

X_{1t} = Density of contributions at time t

X_{2t} = Accumulate fund Size

X_{3t} = No of Members

X_{4t} = retirement age of members

α_i = error term between variables

t = 558 observations

i=1-93 pension schemes

μ_{it} = error term within variables

To test for the controlling effects the study will use

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \alpha_i + \mu_{it}$$

β_1 to β_5 are coefficients of the independent variables and they explain to what degree are changes in performance of pension fund caused by a one unit change in independent variable. β_0 is equal to constant, with α_i equaling to error between variables. μ_{it} refers to the error occasioned by the random effects of the model. The R^2 measure was used to show how much of the performance percent of variation is explained by fund size. Pearson correlation (R^2) was be used to measure the correlation between each independent variable and pension fund performance. T test was be used to establish if the relationship is significant with p value of less than 0.05 showing significant relationship. To test for the controlling effect of exit age, analysis was performed with or without cost variable with the p-values and R^2 observed to check the effect.

CHAPTER FOUR

RESULTS AND INTERPRETATION

4.1 Introduction

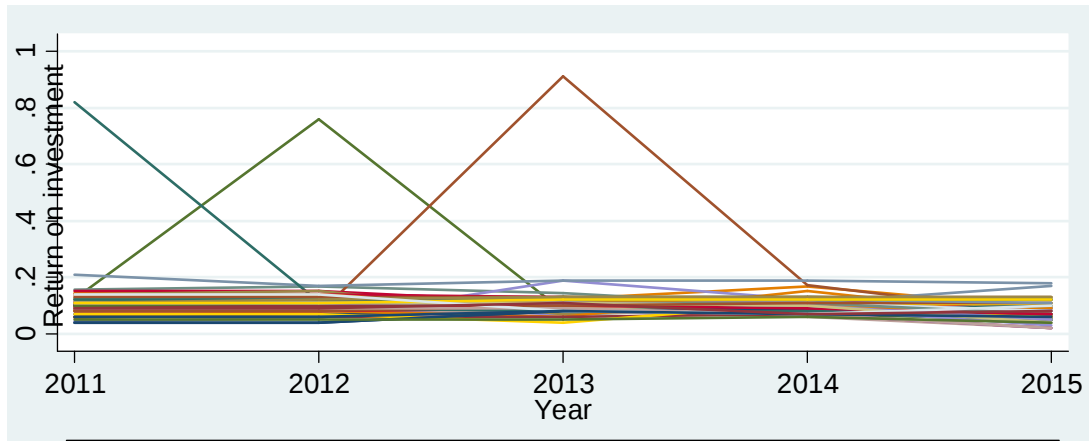
Presented in this chapter are the results of different analyses conducted on secondary data obtained from the Retirement Benefits Authority over a five-year period, 2011-2015. RBA obtains this data from 29 Registered Pension Administrators in Kenya. The statistical analyses were based on the STATA software. The data was entered in excel and latter imported to Stata (12) for transformation. Transformation was done through log transformation followed by data analysis. The results are presented hereafter. The study was based on five specific objectives summarized below;

1. To determine the effect of contribution density on the financial performance of pension funds in Kenya.
2. To determine the effect of fund size category on the financial performance of pension funds in Kenya.
3. To determine the effect of number of members on the financial performance of pension funds in Kenya.
4. To determine the effect of administration costs on the financial performance of pension funds in Kenya.
5. To determine the effect of investment costs on the financial performance of pension funds in Kenya.
6. To determine the controlling effect of exist age on financial performance of pension funds in Kenya.

4.2 Exploratory Data Analysis

4.2.1: Overlain Plots

FIGURE2
Overlain Plots



The overlain plot indicates that return on investment for the pension funds in Kenya is between 0-2 with no outliers on return on investments.

4.2.2 Correlation Analysis

TABLE 4

Correlation Analysis

	roi	lncont-r	lninve-s	lnadmi-s	lnfund-e	lnnoof-s	lnExit-e
roi	1.0000						
lncontribu-r	-0.0776	1.0000					
lninvestme-s	-0.2072	0.5209	1.0000				
lnadminist-s	-0.0681	0.5078	0.8542	1.0000			
lnfundvalue	-0.0726	0.5417	0.6820	0.7904	1.0000		
lnnoofacti-s	-0.0916	0.4476	0.4751	0.5452	0.6515	1.0000	
lnExitage	-0.0562	-0.0212	0.0265	0.0011	0.0209	0.0163	1.0000

Table 4 reports correlations between the variables used in our panel regressions. Several points are worth noting. First, all the variables exhibit a negative correlation with return on investment in the study. Secondly, all the independent variables had a weak negative correlation with the financial performance of pension funds. However, the results indicates that correlation between contribution and investment expenses, administration expenses, fund value and number of active members was found to be positive. The same was established on the relationship between Investment expenses and administration expenses, fund value, number of active members and exit age, with the results showing mild significant correlation. These results contradict the findings of Chen (2004) who found out a positive and significant correlation between expenses, pension contribution, retirement age and financial performance of pension funds.

4.2.3 Autocorrelation Tests

Autocorrelation tests were carried out through Arellano-Bond tests with the results indicating absence of autocorrelation as indicated by p-values less than 0.05.

TABLE 5
Autocorrelation Tests

```

Arellano-Bond dynamic panel-data estimation Number of obs      =      201
Group variable: pseudoname                 Number of groups     =      85
Time variable: year

Obs per group:   min =      1
                  avg =  2.364706
                  max =      3

Number of instruments =      13           Wald chi2(7)         =    134.24
                                                Prob > chi2          =    0.0000

```

One-step results

roi	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
roi						
L1.	.0001817	.0570181	0.00	0.997	-.1115717	.111935
lncontributionsfortheyear	.006611	.00235	2.81	0.005	.0020051	.0112169
lnfundvalue	-.030006	.0088843	-3.38	0.001	-.0474189	-.0125932
lnnoofactivemembers	-.0054417	.0103525	-0.53	0.599	-.0257322	.0148488
lninvestmentexpenses	-.0215605	.0023029	-9.36	0.000	-.0260741	-.017047
lnadministrativeexpenses	.0338672	.0044777	7.56	0.000	.025091	.0426433
lnExitage	-.0282822	.0504631	-0.56	0.575	-.1271881	.0706238
_cons	.5099563	.2520709	2.02	0.043	.0159063	1.004006

Instruments for differenced equation

GMM-type: L(2/.)roi

Standard: D.lncontributionsfortheyear D.lnfundvalue D.lnnoofactivemembers D.lninvestmentexpenses D.lnadministrative D.lnExitage

Instruments for level equation

Standard: _cons

. estat sargan

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(5) = 27.69424

Prob > chi2 = 0.0000

4.2.4 Heteroscedasticity

Breusch-Pagan was used to test for the residuals. The results indicated that there was no serial correlation in the data. This was shown by p-values less than 0.005.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of roi

chi2(1)          = 1131.88
Prob > chi2     = 0.0000
```

4.2.5 Test of Multi-collinearity

Regression analysis is based on a number of assumptions, one of which is that there is no collinearity among the independent variables. Value inflation factor for the independent variables was thus computed to check for unusually high values. The results of the analysis showed that there was no multicollinearity among all the variables. This was indicated by VIF values less than 4 that indicate absence of multicollinearity. The results presented in Table 4.3.

TABLE 6
Multi-Collinearity Tests

. vif

Variable	VIF	1/VIF
lnfundvalue	2.62	0.380965
lninvestme~s	1.99	0.501827
lnnoofacti~s	1.78	0.562560
lncontribu~r	1.54	0.649482
lnExitage	1.00	0.997258
Mean VIF	1.79	

4.2.6 Unit Root Tests for Stationarity

Unit root test for stationary were not carried out for the panel data. This was informed by argument that unit root for panel data is not necessary for data that is less than 10 years (Baltagi & Kao, 2010; Torres-Reyna, 2011).

4.2.7 Descriptive Statistics

Table 7(a) show the descriptive statistics for the data analyzed.

TABLE 7
Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
roi	465	.1025105	.0647109	.02	.912
lncontribution	445	15.75224	2.089138	5.232986	20.03875
lninvestment	443	13.06486	2.062006	3.039501	19.3551
lnadministration	443	13.30546	1.870403	6.448889	19.3551
lnfundvalue	465	18.08867	1.539047	14.65035	21.78619
lnnumberofactive	406	4.542373	1.361355	1.386294	8.549661
lnexitage	464	4.038837	.0418627	4.007333	4.094345

The sample covered a total of 93 pension schemes covering a period of 5 years from 2011 to 2015. The period of observation is from January 2011 till December 2015. This results in a balanced panel. All return observations are in ratio. The mean score for contribution density was 15.75 with a standard deviation of 2 and minimum maximum values of 5.2329 and 20.0380 respectively. These results indicate that there is a large dispersion in terms of contribution among the small and big pension schemes. Investment expenses for the year averaged 13.06486 while administration expenses averaged 13.30546. Investment expenses and administration expenses also had a standard deviation of 2.062066 and 1.870403 respectively. These results indicate that pension schemes had nearly same expenses costs. However, the results indicate that administration expenses had low variability when compared to investment expenses. Fund Value had a mean of 18.088 with a standard deviation of 1.539047. These results indicate that most pension schemes are relatively of low value. The study results also showed that number of active

members had a mean of 4.5423 with standard deviation of 1.361355. The results indicate majority of pension schemes are small in size in terms of membership. Exit Age on the other hand had a mean of 4.007333 and a very low standard deviation of 0.0418627. This indicates very low variability with pension schemes on having two exit age of 55 and 60 years.

4.3 Normality Tests

A normality test was conducted on the panel data to determine the distribution of data in the series. The aim of the test was to determine the normality of the variables for analysis. From the results of the Shapiro Wilks test the results indicated that only two variables were normal. These include exit age and administrative expenses. These were indicated by p-values of 0.0696 and 0.63875. The other variables had insignificant p-values indicated by p-values of 0.000, 0.000, 0.0209 and 0.01617. The pertinent results are presented in Tables 4.3 below.

TABLE 8
Shapiro-Wilk Test .

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
roi	465	0.36697	199.480	12.688	0.00000
lncontribu~r	445	0.86082	42.160	8.946	0.00000
lninvestme~s	443	0.97143	8.621	5.150	0.00000
lnadminist~s	443	0.99384	1.859	1.483	0.06906
lnfundvalue	465	0.99225	2.443	2.140	0.01617
lnnoofacti~s	406	0.98807	3.330	2.864	0.00209
lnExitage	464	0.99726	0.862	-0.355	0.63875

4.4 Fitting the Model

The next technical issues relate to the panel structure of the sample. The first one to be addressed is testing for unit effects (Wooldridge, 2002). When unobserved unit effects are present in a panel the OLS estimator is biased and inconsistent. However, there are panel estimation methods that deal with this and their main difference relates to the correlation between the unit effects and the explanatory variables. Random effects estimation assumes that there is no correlation, whereas fixed effects estimation allows for it. If there is such correlation the random effects estimator is inconsistent. There is a method developed by Hausman (1978) which tests whether there is a systematic difference between the estimated coefficients of the random and fixed effects

estimation. The Hausman test results are similar across different specifications and samples so for brevity reasons only those for the all-fund sample are presented here. Fixed effects are tested by the F test, while random effects are examined by the Lagrange multiplier (LM) test (Breusch and Pagan, 1980). According to Park 2011 the selection of random tests and fixed effect is determined by the p-value with a p-value of less than 0.05 leading to selection of fixed effect and the reverse is true. Table 9 has the results of Hausman specification tests. The Hausman specification test shows that fixed effect is used in the model since p-value is less than 0.05. Fixed effects have dominated the study of pension fund performance. This is attributed to the reason that it helps to control for the possible changes of investment set as time passes. The use of Fixed effect in the study is supported by the following pension performance studies: Petraki, (2012); Robu & Sandu, (2011) and Paramati, Mo, & Gupta (2016).

TABLE 9

Hausman Specification Tests

. hausman Fixed Random

	—— Coefficients ——		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) Fixed	(B) Random		
lncontribu~r	.0051471	.0020557	.0030914	.0016536
lninvestme~s	-.0236259	-.0195336	-.0040923	.0012119
lnadminist~s	.0309315	.0199096	.0110219	.0027966
lnfundvalue	-.0206414	-.0050466	-.0155947	.0075563
lnnoofacti~s	-.0018012	-.0036534	.0018522	.0083484
lnExitage	-.0498209	-.0500902	.0002694	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 28.98
 Prob>chi2 = 0.0001
 (V_b-V_B is not positive definite)

4.5 Testing the Fixed Effects Model

A fixed effect analysis was performed on the relationship between the study variables, fund value, pension contribution, number of active members, exit age, investment expenses, and administration costs. Table 10 and Table 11 reports the regression results with and without control variable. These included the following variables; Fund value, administration expenses, investment expenses, number of active members and pension contribution.

The linear relationship was modelled into equation (1) below.

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \alpha_i + \mu_{it}$$

The study was based on the following hypothesis (H₀₁- H₀₅) which stated that:

H₀₁: There is no significant accumulated fund assets and performance of pension funds in Kenya

H₁: There is significant relationship between accumulated fund assets and performance of pension funds in Kenya

H₀₂: There is no significant relationship between density of contribution and performance of pension funds in Kenya

H₂: There is significant relationship between density of contribution and performance of pension funds in Kenya

H₀₃: There is no significant relationship cost and performance of pension funds in Kenya

H₃: There is significant relationship between cost and performance of pension funds in Kenya.

H₀₄: There is no significant relationship between pension membership and performance of pension funds in Kenya

H₄: There is significant relationship between pension membership and performance of pension funds in Kenya

H₀₅: There is no significant mediating effect retirement age on the relationship between fund size and performance of pension funds in Kenya.

H₅: There is significant mediating retirement age on the relationship between fund

performance of pension funds. This implies that a unit increase in pension contribution will increase the financial performance of pension funds by 0.005147. The findings of the study are consistent with the results of Dyck et al., 2012.

The regression coefficient of investment expenses was negative and significant in predicting the financial performance of pension fund in Kenya. This implies that a unit increase in investment costs results in reduced financial performance of pension fund by 0.0236259. These results contradict the findings of Petraki (2012) who established that increased investment costs leads to improved performance.

The regression coefficient of administrative expenses was established to be positive and significant. This implies that a unit increase in administrative costs results in improved financial performance of pension fund by 0.0309315. This is influenced by what Pollet & Wilson, (2008) labels the management effect on pension funds.

The regression coefficient of fund asset value and financial performance of pension schemes was negative and significant. This implies that a unit increase in fund asset value results in reduced financial performance of pension fund by 0.0206414. These findings are consistent to the findings of Robu & Sandu (2011) established a negative and significant relationship with pension fund performance.

From the results of the study it was evidenced that number of active members and exit age had no significant relationship with the performance of pension funds in Kenya. These findings imply that a unit increase in number of active members results into reduced financial performance by 0.019687. This finding contradict the findings of Ban and Choe, (2013) who established number of active members had a positive effect on financial performance of pension

funds.

Table 11 presents the regression results of the study without control variable. The regression coefficient of pension contribution was positive and significant in predicting the financial performance of pension funds. This implies that a unit increase in pension contribution will increase the financial performance of pension funds by 0.0052615. The findings of the study are consistent with the results of Dyck et al., 2012).

The regression coefficient of investment expenses was negative and significant in predicting the financial performance of pension fund in Kenya. This implies that a unit increase in investment costs results in reduced financial performance of pension fund by 0.0237754. These results support the findings of Andonov (2015) who established that increased investment costs leads to reduced performance.

The regression coefficient of administrative expenses was established to be positive and significant. This implies that a unit increase in administrative costs results in improved financial performance of pension fund by 0.0311936. This is influenced by what Pollet & Wilson, (2008) labels the management effect on pension funds.

The regression coefficient of fund asset value and financial performance of pension schemes was negative and significant. This implies that a unit increase in administrative costs results in reduced financial performance of pension fund by 0.0208095. These findings are consistent to the findings of Robu & Sandu (2011) established a negative and significant relationship with pension fund performance.

From the results of the study it was evidenced that number of active members had no significant relationship with the performance of pension funds in Kenya. These findings imply

that a unit increase in number of active members reduced financial performance by 0.019687. This finding contradicts the findings of Ban and Choe, (2013) who established number of active members had a positive effect on financial performance of pension funds.

From the estimated regression equation;

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \alpha_i + \mu_{it}$$

Where β_0 is the constant = 0.50206, $\beta_1 = 0.05114$, $\beta_2 = -0.0236$, $\beta_3 = 0.0309$, $\beta_4 = -0.0206$, $\beta_5 = -0.018012$, $\beta_6 = -0.0498$. The fitted regression equation of the model becomes;

$$Y_{it} = 0.50206 + 0.0514X_{1t} - 0.0236X_{2t} + 0.0309X_{3t} - 0.0206X_{4t} - 0.018012X_{5t} - 0.0498X_{6t}$$

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study sought to find the effect of Fund Size on financial performance of pension funds in Kenya. This objective was realized by assessing the effect of pension contributions, number of

active members, investment expenses, administrative expenses, fund asset value and exit age on financial performance of pension funds.

5.2 Summary of Findings and Discussion

The study sought to establish the effect of pension contributions on the financial performance of pension funds. The study revealed a positive and significant relationship between pension contribution and financial performance. From the results it was evident that the null hypothesis that which states that pension contributions has no significant effect on the financial performance of pension funds was rejected. This finding is espoused by Chan et al. (2004) who noted that pension funds with more members are expected to have a higher value in contributions and assets compared with smaller ones. The funds therefore receive sizable contributions that may result in inefficiency in investments. Thus the larger pension funds have large sums of money at their disposal that they tend to invest in less profitable ventures as opposed to smaller pension funds with smaller financial resources that force them to allocate the money judiciously to the most profitable opportunities. Moreover, the larger pension funds with huge investments in the stock market are exposed to more risk as opposed to the smaller funds (Bikker and Dreu 2009). According to Dasgupta et al, (2011) argue that pension contribution improves the cash outlay of pension funds thus allowing pension funds to invest with positive return on investments. These findings are similar to Ochei (2013) and Okafor (2012) results that showed a positive relationship between pension contributions and the financial performance of pension funds. It thus follow that increased pension contribution can positively affects the performance of pension fund.

Concerning the investment expenses, the study revealed that there was significant

negative relationship between investment expenses and financial performance of pension funds in Kenya. Thus the null hypothesis was rejected: investment expenses have no significant effect on the financial performance of pension funds. Dyck and Pomorski (2011) argue that superior returns come from increased allocation to alternative investments which are associated with increased investment expenses. These findings implied that pension funds with higher investment costs have better performance. These findings support the findings of Njeru (2014) who established that increased investment is associated with improved performance for pension firms in Kenya.

The study also sought to establish the effect of administration costs on financial performance of pension fund in Kenya. The study rejected the null hypothesis that states that there is no significant effect of administration expenses on financial performance of pension funds. From the regression output, results imply that increased administrative cost increase the financial performance of pension funds. As argued by Bateman and Mitchell (2004) increase in administration costs can results into improved pension performance when it addresses critical issues in pension management. This study results support the findings of Broeders, Rijsbergen, & Oord, (2013) who asserted that reduced costs impacts positively on financial performance of pension funds.

From the regression output, results indicated a non-significant relationship between age, number of active members on the financial performance of pension fund in Kenya. The study thus accepts the two null hypothesis that: age has no significant effect on financial performance of pension fund and number of active members has no significant effect on the financial performance of pension funds. The finding contradicts Oluoch (2013) who found a strong

positive relationship between exit age and pension funds' performance in Kenya. The finding also concurs with Mwachanya, (2015) who established that number of active members has no significant effect on the performance of pension funds.

The findings of the study indicated that there was significant relationship between fund asset and financial performance of pension funds in Kenya. The study thus rejects the null hypothesis that fund asset has no significant effect on the financial performance of pension funds. This was confirmed by a p-value of 0.019.

Fund Size was confirmed to affect the financial performance of pension funds as shown by an R squared value of 6%. However, the effect of fund size was found to be small. A situation that Chen, Hong, Huang, & Kubik (2004) attribute to limited effect of family size that has been established to greatly improve the effect of fund size on performance of pension funds. These results concur with the results of Paramati, Mo, & Gupta, (2016) who established a minimal effect of 14% on pension fund performance.

5.3 Conclusion

From the foregoing presented and analyzed findings pension contributions is a significant firm characteristic of financial performance among pension schemes in Kenya. Thus it can be concluded that more pension contribution portends higher fund return. Accumulated fund asset is also a significant firm characteristic of pension schemes' financial performance. Particularly, the study concluded those larger assets are likely to experience lower financial performance as compared to the smaller assets. This could be attributed to poor management associated with larger assets value. From the study findings it is also concluded that investment expenses is a significant contributor to financial performance of pension funds. Investment costs are associated

with lower returns for pension funds.

Administration costs were found to be key contributors to pension fund financial performance in Kenya. The study findings concludes that pension fund with higher administrative costs are associated with improved financial performance while lower administrative costs is associated with improved financial performance of pension fund. Exit age was established to have no significant effect on financial performance of pension funds. Thus it can be concluded that increasing retirement age does not necessarily results to improved pension fund performance. Number of active members is concluded to have no significant effect on financial performance of pension funds. Pension schemes in Kenya should necessarily not be over concerned with increase in number of active members.

The whole regression analysis was statistically significant indicating that the fund size significantly determines the finance performance behaviour of the pension funds. However, the significance of fund size is small thus pension schemes in Kenya should not put much emphasis on increasing their fund size.

5.4 Recommendations

Proposals for financial performance improvement, adjustments and growth of the pensions industry in Kenya must necessarily take into account the major drivers identified in the study findings. The study recommends that pension schemes should pay more attention to pension contribution, administration costs and accumulated assets have been found to positively influence financial performance of the pension schemes surveyed. There is need for the industry players to lobby for attractive policies to encouraged younger individuals and corporations join various schemes. There is need for pension schemes to develop strategies to reduce investment

costs that are associated with reduced financial performance. The study recommends the need for government to develop policies and regulations that will enhance pension contribution. Related to these there is need for government to encourage and create environment that will lead to the development of family size in the pension industry in Kenya.

5.5 Recommendations for Further Research

The study recommends the need for more studies that will focus on private pension schemes and public pension schemes to explore the effect of fund size on each plan, as opposed to aggregating all the pension plans.

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APPENDIX ONE: DATA COLLECTION FORM

Variables	2011	2012	2013	2014	2015
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Fund Value					
Retirement Age					
Number of Active Members					
Administration Costs					
Investment Costs					
Density of Contribution					