

**PERFORMANCE PERSISTENCY OF RETIREMENT BENEFIT
FUND MANAGERS IN KENYA**

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D61 / 62869 / 2010

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS UNIVERSITY OF
NAIROBI.

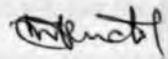
OCTOBER, 2012

Declaration

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than The University of Nairobi for academic credit. I further declare that I followed all the applicable ethical guidelines in the conduct of the research project.

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Acknowledgement

This research paper is made possible through the help and support from a number of people, including: parents, lecturers, family, and friends. Special dedication of acknowledgment and gratitude toward the following significant advisors and contributors:

First and foremost, many thanks to Dr. Aduda O. Josiah for significant supervision, advice, encouragement, guidance and mentorship through out the project. He kindly read the paper and offered invaluable detailed advice on grammar, organization, and the theme of the paper.

Secondly, many thanks to Mr. Herrick Ondigo for moderating the paper and offering advice and guidelines on the areas that needed smooth lining and for reproof of the paper, without whose tireless effort the paper wouldn't come in this form and format.

Consequently many thanks to all the other professors who through their lectures impacted knowledge that made this research report possible.

Also, many thanks to Ms. Monica Were, Senior Researcher, RBA for providing the data set that enabled analysis and thus the report and this won't be complete without mentioning the demanding effort of the RBA IT personnel who went out of their busy daily schedule to query the RBA database for the dataset for all the years under study; and to crown this, many thanks to Mr. Edward Odundo, CEO, RBA for having heeded to a letter for dataset request and authorized the release for such data that were hard to come by through the fund managers.

And lastly express utmost gratitude and special thanks to family, especially to parents, who have made possible that my dream of studying come true, to siblings who offered relentless encouragement and motivation that it is possible.

The product of this research project would not have been possible without all of them.

Abstract.

This study sought to study performance persistence, over time, during a study period of between 2006 through 2011 in the performance of fund managers' responsible for investments of Kenya Retirement Benefit Funds on behalf of the Trustees and the Scheme members. The fund managers make investments decisions and invest the schemes funds in an array of investment vehicles ranging from property, government securities, quoted shares, unquoted shares, corporate bonds, offshore investments, guaranteed funds among many others and declare income rate at the close of specific period, usually per annum; this income rate being the proportion of the accumulated incomes over the fund value under a particular fund manager.

The study adopted a descriptive a Research Design. It studied 10 fund managers with a sample of 265 segregated retirement benefit schemes, data secondary in nature, was drawn from the RBA systems Analysis involved averaging abnormal returns across the funds under a fund manager which was both equally weighted by fund size. Asset pricing models, as the Fama- French three-factor model and the single factor CAPM, were used in iterative regression models, and the factor loadings were estimated over the whole study period. Performance of a fund manager was computed by averaging the abnormal returns of the pension funds managed by a fund manager for each year. Performance ranked portfolio tests were used to sort fund manager each period into 2 portfolios with equal numbers of fund managers based on past performance with an annual ranking period where ranking was on basis of the average return on the funds under management in the ranking period. Top portfolio consisted fund managers with the highest average abnormal returns in the ranking period while bottom portfolio with those fund managers with the lowest average abnormal returns. After which, equally weighted average portfolio abnormal return of the top and bottom portfolios over a subsequent evaluation period were calculated which were further averaged over all evaluation periods and a difference was computed which indicated persistency as it was not centered at zero.

The study found evidence of performance persistency of retirement benefit fund managers in Kenya where it analyzed a data set of 265 segregated retirement benefit schemes as

managed by 10 fund manager where the schemes never changed the fund management company through out the study period which was a control over the companies that hop fund managers. In analysis, the study used the French and Fama Three Factor Model and CAPM model in computing each of the 265 schemes abnormal returns by regressing each schemes income rate with the excess market return, size factor and the book to market factor to obtain the standardized parameters for the above models which were then used in calculating the abnormal returns for the each of the schemes which were further averaged for each fund managers. Data was provided by RBA. However this study propose further studies on this area especially for the schemes that hop fund managers; also include the cost factor in the analysis. Also look for other factors that affect returns and not only the excess market return, the size factor and the book to market factor.

Keywords: performance persistence, retirement benefit funds, fund managers.

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ABBREVIATIONS

APT	-	Arbitrage Pricing Theory
CAPM	-	Capital Asset Pricing Model
CSPS	-	Civil Servants Pension Scheme
DB	-	Defined Benefit
DC	-	Defined Contribution
FRS 17	-	Financial Reporting Standard 17
GDP	-	Gross Domestic Product
IRS	-	Individual Retirement Schemes
MPT	-	Modern Portfolio Theory
NSSF	-	National Social Security Fund
OECD	-	Organization for Economic Co-operation and Development
ORS	-	Occupational Retirement Schemes
PAYG	-	Pay As You Go
RBA	-	Retirement Benefit Authority
RBS	-	Retirement Benefit Scheme
UK	-	United Kingdom

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Fund performance Persistence is when there exists a superior performance higher than some estimated median performance level, over several periods of time and it captures two dimensions of fund management, that is; first is the ability to generate excess return as compared to a given benchmark portfolio (e.g., manager skills such as market-timing ability and stock picking ability), and secondly the ability to maintain performance over time (e.g., to do better than other competitive managers or to be outperforming through time) Tonk (2003)

Tonk (2003) points out that identified approaches for measuring fund performance persistence include: contingency tables (for example, counting the number of time periods with outperforming returns), regression studies (assessing the impact of past fund alphas on current fund alphas), and funds' ranking based on appropriate performance measures (for example, appraisal ratio, modified Sharpe ratio, Park ratio, and alternative investment risk-adjusted performance).

According to Tonk (2003), fund performance persistence can be explained by a set of key security-based factors such as size (i.e., market capitalization), value, momentum (e.g., short-term past performance), fees and expenses (e.g., management and incentive fees, performance fees, load charges, operating fees, transactions costs), and investment style (e.g., aggressive and/or conservative investments focusing on aggressive growth, growth, growth and income, balanced or income securities among others) as well as related style persistency.

Retirement Benefit funds are savings and investment plans that provide income during retirement and are often created by companies or the government for employees under defined guidelines under authority of RBA. They are purposed to provide retirement income to members of such plans on retirement while *Fund Managers* are Retirement

Benefit fund players whose responsibility is to advise the trustees in the making of investment decisions of the fund, (RBA 2008).

Retirement benefits savings steadily continues to form a greater proportion of the Gross Domestic Product of many countries through out the world and Kenya is not an exception, noting that as at close of 2005, retirement benefits assets reported a 12.49% of the GDP (RBA, 2007) and that just a year later, that close of 2006 rose to Kenya Shillings 224 billion, a growth which has been steady since 2001 from a low of Kenya Shillings 40 billion (RBA, 2007)

Occupational retirement benefit schemes were introduced in Kenya to meet the varying needs of employers and employees (Wanjohi et al, 2011); that is employers wanted a tax efficient and paternalistic means to controlling their workforce and employees wanted a secure pension in retirement that bore some relation to the income they had received while working (Hardy,1993).

In Kenya, employers or Trust Corporations set up Retirement Benefit Schemes funds under irrevocable trusts which are usually done with keen accord to the underlying laws and regulation; particularly the enacted Acts of parliament like: Trustees (Perpetual Succession) Act Cap 164; Trustees Act Cap 167; Public Trustee Act Cap 168; Perpetuities and Accumulation Act 1984; Income Tax Act Cap 487 Retirement Benefit Act, (1997) (Rono, 2009). Such trusts are established by a deed between the employer, and the Trustees who manage the scheme with the assistance of stipulated services providers like fund managers. A trustee of a scheme must be fair, equitable, prudent, and honest and a person of high integrity, he is often referred to as a trusted friend (Wanjohi et al, 2011).

Retirement benefits funds have undergone major development in recent years, at both international and national levels. At the end of 2009, total world assets managed by pension funds reached 12,740 billion euros (Marti 2011)

With dynamisms in the social lives, the ageing is prompting an increased focus on provision of adequate retirement incomes to the elderly, either by public or private means (World Bank 1994).

Retirement benefit funds capitalism is going global with a reprisal Ambachtsheer (1998), in reference to recent study projected global pension assets to reach US\$12 trillion by the year 2000. The productivity of this huge investment pool will be an important determinant of global living standards in the subsequent years retirees around the world hope to enjoy their golden retirement years. Furthermore, on a microeconomic level, pension fund performance is an important determinant of the expense of sponsoring a pension plan. Increasing a plan's long-term return on pension assets can reduce pension expenses or increase pension payouts. Therefore, development of a standardized approach to measuring pension fund performance and understanding its determinants is now critical. Thus this research project sought to analyze the existence of performance persistency of individual fund management firms that have been appointed as fund managers of segregated retirement benefit schemes in Kenya as they play a major role in the long-term investment excellence of the pension schemes (Tonk 2003).

Development of collective investment institutions has aroused great interest in the financial sector in general and among scholars in particular which has resulted to various studies for example Levy and Mántey (2003) that purposed to clarify the role of collective investment institutions in the financial market and in the economy in general. Other authors have as well studied pension fund performance persistency for example Tonk (2003) employing the French Fama three factor model (later adopted in this study), Contingency tables and performance ranking methods for measuring the performance persistency of the pension fund managers.

A number of authors have used these methods to measure pension fund performance. For example, when analyzing the US market, Coggin (2000) uses Jensen's model to examine the performance of 229 equity pension funds. The results obtained show that, overall, managers obtain positive returns. Collins and Fabozzi (2000) obtained similar results

when they implement several models, among them the traditional model put forward by Jensen (1968), on a sample of 37 pension fund managers.

Methods proposed by Sharpe (1966), and Jensen (1968) to assess fund performance although were widely accepted, such measures have caused controversy, as their capacity to identify the investors who have and use more information has been questioned. For example, most of the disapproval made by Fama (1972) centered on Jensen's alpha, possibly as a result of its extended use among professionals and scholars. To this regard, many authors among them Cumby and Glen (1990) point out that Jensen's alpha has two limitations that may cause biased estimators. According to Admati and Ross (1985) first inadequacy is when the level of risk taken by the manager is assumed to be constant over time which may give rise to abnormal return estimators when managers have market timing ability and second disapproval is the appropriateness of the benchmark used.

Roll (1978) however, highlights the importance of using an efficient benchmark. Further, Grinblatt and Titman (1994), prove that the choice of the benchmark affects the magnitude of Jensen's alpha and as Ferson and Schadt (1996) clarify, not using of benchmarks may generate biases in the measurement of results. But this study employed the 3-factor model as put forth by Fama and French (1993) since in the Kenya there are no institutions to set benchmarks like S&P in the USA.

This study sought to inspect whether fund managers consistently add value to the performance of the funds under their management. This is a general question in the context of delegated portfolio management, and thus the study focused on the specific area of the investment decisions of pension funds. Pension funds are major investors in financial markets.

Several recent policy documents in the UK have argued that pension contributions should be investing in tracker funds; on the basis that there is little evidence that active fund management can deliver superior investment returns for the consumer. The purpose of this study was to assess this claim making use of a large dataset on annual returns to

Kenyan pension funds, in which the fund manager managing the pension fund in each year was identified. Occupational pension schemes in the Kenya are usually funded and require contributions throughout the employees working life (Odundo 2006). In a funded scheme an employee pays into a fund, which accumulates over time, and then is allowed to draw on this fund in retirement. These schemes are provided by an employer and may pay on a defined benefit or a defined contribution basis. Defined benefit (or final salary) schemes offer a pension, guaranteed by the employer, usually defined in terms of some proportion of final year earnings, and are related to the number of years of employment. Defined contribution (or money purchase) schemes are always funded and convert the value of the pension fund at retirement into an annuity. Under both types of scheme the fund is administered by trustees, usually nominated by the employer, and the trustees, following advice from actuaries, decide whether to invest the assets of the fund in a pooled or segregated investment options guided by fund managers.

According to Tonks (2003), the trustees of the large pension funds typically delegate the management of the pension fund portfolio to fund managers. These fund managers may be in-house, employed directly by the pension fund, or the trustees may out-source the management of the fund to an external fund management house. The pension funds in this study's sample were these segregated funded occupational pension schemes. For a segregated fund, the trustees hire a fund manager (in-house or outsourced) to make the investment decisions on behalf of the fund according to some specified mandate. Lakonishok, Shleifer and Vishney (1992) refer to the fund management of pension funds as a double agency situation, since the employee as principal, and who will eventually become the recipient of the pension then delegates' pension fund decisions to the trustees who in turn delegates the investment allocation decisions to a fund manager for the prudent investment of the scheme funds.

The purpose of this study was to analyze the existence of performance persistency of fund management companies that have been appointed as fund managers of segregated occupational pension funds. Results of the study answer questions of if it possible for a pension fund trustee to identify a fund manager fund manager company that consistently

outperform? This study is important in that it aids in asset allocation level, the conclusions of the analysis of the distribution of returns aids trustees in their decision as to whether to invest their pension fund monies in an active or in a passive vehicle in a bid to realize better returns for better and sound financial stature of the schemes funds under management.

Data that was used to yield the results for this study were secondary in nature and were drawn from RBA data sets for the fund managers under study detailing the variables required for the study for the study period 2006 to 2011.

1.2 Research Problem

Fund managers are nominated by the trustees and are responsible to invest the pension funds (Ambachtsheer, 1998) expected to register persistent returns, and Tonks (2003) notes that Pension funds, are major investors in financial markets, owning 20 per cent of UK corporate equity. In Kenya, they form greater portion of Kenyan GDP (at 12.49% by end of 2005) and rose to KShs. 224 billion by end of 2006 (RBA, 2007), having grown from KShs. 40 billion in 2001 (RBA, 2007); this indicates no mean importance in a country's well being socially, financially and economically (Wanjohi et. al2011). Persistency in performance by fund managers in investing funds would be beneficial to the RBS stakeholders. Great attention has emanated among scholars and investment market as a result of increasing investment houses thus it's prudent for the trustees to choose the best fund manager who'll realize better and persistent fund performance, (Tonk 2003). Varied fund performance persistency models have been employed, for example the CAPM and the French and Fama (1993) three factor model among others.

Elsewhere scholars have tried to establish the performance persistency of funds investments, mostly on mutual funds, using varied models and come up with varying results for example, works by Sharpe (1966), and Jensen (1968), proposed various measurements that they applied to mutual fund sample. These methods were widely accepted, but have since caused debate, as their capacity to identify the investors who have and use more information has been questioned; for instance, most of the disapproval

made by Roll (1978) was on Jensen's alpha, as a result of its extended use among professionals and scholars. In effect, Cumby and Glen (1990) argue that Jensen (1968) alpha had two shortcomings that generated biased estimators. First inadequacy was when the level of risk taken by the manager was assumed to be constant over time which gives rise to abnormal return estimators when managers have market timing ability. Second disapproval was the appropriateness of the benchmark used. Hence the application of the French and Fama (1993) in measuring the performance persistency for the pension fund management in Kenya just as applied by Tonk(2003) for the UK market to measure the persistency to aid the Trustees in choosing the best investment house in Kenya for the betterment of their schemes.

Its evident models have been inadequate on measuring persistency as scholars have poked holes on each others. Also, in Kenya studies have dimly addressed RBS fund performance and thus performance persistency, though, some have looked into these funds investments. Gitundu (2010) found that asset allocations differ between various pension funds, an indicator that the criteria for developing the optimum investment mix differ between fund managers. Also found that although performance of pension funds assets is comparable to various market indexes, there is no defined standard performance measure hence some fund managers construct in-house indexes for some assets; others use available economic performance indicators, while others were silent on the performance of the pension funds portfolio. Rono (2009) found that returns, investment risks, investment portfolio, past performance, legal framework, Persistency and return maximization in the rate of returns, prevailing economic and political situations-inflation, global markets and trends in interest rates were the factors affecting Fund Managers investment decisions. Rono (2010) found that annual investment return for retirement benefits schemes in the period RBA was in force ranged between 10 and 27.52%, sometimes falling below the annual inflation and this used to be low before RBA came into force. Studies that have been investigating aspects related to investment performance of RBS funds as managed by fund managers in the Kenya hasn't vividly unearthed the much needed knowledge on the performance quantification pointers and performance consistencies thus the gist of this study.

1.3 Research Question

Thus the research question for this study was; Are the Kenyan Retirement Benefit Fund Managers persistent in their investment performances?

1.4 Objective of the Study

The purpose of this study was to identify the existence of performance persistency of fund management companies that have been nominated by the of segregated occupational pension funds trustees to run the investment activities of the schemes' funds.

1.5 Value of the Study

Results of this study are beneficial to vast number of players in the Kenyan retirement benefits arena. Importance of this study rests on its findings that guide the *Retirement Benefit Scheme* Trustees in choosing the investment sound fund management house that have demonstrated good performances and as well shown persistency in their return declarations. This is a prudent case for the trustees in a bid to improve the carry home of the retirees as the funds shall have accumulated optimal levels funds overtime when they engage fund management house who've shown this.

Investment accountability lies squarely on the trustees and thus aspects that would lead them to realizing better financial performances ought to be studied and promoted as policies within the running of retirement benefit schemes. Good investment strategy ensures better returns and lesser risks for RBS funds. In a bid to ensure better returns, lesser risks, easy administration, RBS funds have no option but to come up with sound investment strategies and employ them without fail. As a consequence of better RBS Fund manager choice, RBS fund's realize their short-term (less than 3 years), intermediate (3 to 10 years) and long-term (more than 10 years). A better, investment strategy ensures that money is available to pay benefits and other costs as they fall due. Hence, as a consequence, investment strategy grants an appropriate blend connecting the long-term and short-term financial instruments where the investments are made in consideration of the expected maturity of liabilities.

Findings for this study also help the *Government* in enacting policies that pertain to the running of retirement benefit schemes. This the government does through its regulatory agencies, for the Kenyan case being the Retirement Benefits Authority (RBA). For instance if the study identifies that the there exists a persistency exists amongst the fund management house as this study did, then it would be in the interest of the government to repeal the act and advise on how long a scheme should remain with a fund manager.

CHAPTER TWO

LITERATURE REVIEW

1.1 Introduction

This chapter details further, literature on the content discussed in the background as relates to topic of study. That is; expounds on Theories that relate to this topic that have been brought forth by scholars trying to explain the investment performance persistency aspects of retirement benefit funds as carried out by the Fund Managers, Historical development of Retirement Benefit Schemes, Retirement Benefit Schemes Fund Systems and Designs in Kenya, the Fund managers and their roles, Fund Managers Performance Persistency and how its measured, a review of empirical studies relating to area of study as have been reported by scholars and a conclusion on all this areas bringing out the gaps that exist amongst theories and the past studies that thus justifies this study. Build up for this literature review was conducted from textbooks, journals, periodicals, seminar material, past research studies and internet search.

1.2 Theoretical Review

2.2.1 The Integration Theory

This theory states that “The assets of the pension scheme are inseparable from the assets of the firm, which is sponsoring the defined benefit scheme”. Integration theory is consistent with the corporate finance perspective, which implies that the firm effectively owes the RBS. According to this integrated balance sheet approach, the firm’s pension benefit obligations are money-fixed liabilities of shareholders.

Countries Laws’ have adopted this theory in practice, for example the FRS 17 appears to adopt the integration theory by requiring UK firms to recognize any pension scheme surplus or deficit on their balance sheet (Klumpes et al. 2003). When assuming that a sponsor company has the possibility of rearranging RBS related debts, than it can be predicted that the termination decisions by UK companies are basically explained by the need to curtail unfunded obligations in order to improve the financial wellbeing of the company (Klumpes et al. 2003). Thus, the shift away from DB schemes may be explained by firm-specific characteristics.

2.2.2 The Separation Theory

This theory states that “The assets of the pension scheme are separated from the assets of the sponsoring company. Justification for the separation theory is derived from the labor economics literature, which implies that sponsor companies have implicit long term contracts with their employees (Klumpes, 2001).

Separation theory assumes that workers have partly funded their own RBS through acceptance of lower current wage in exchange for future RBS benefits, meaning that employer companies and sponsored pension funds are separate entities, consistent with the fact that sponsoring firms and pension funds are legally required to be managed separately. So, the assets surpluses and deficits are belonging to the employees (Klumpes et al., 2003). Thus, in essence, a company is assumed to provide an under-funded RBS, and this is attributed to the fact that the sponsor company cannot use the assets placed in a RBS for other purposes (Klumpes et al. 2003). So, the switch away from DB schemes may be explained by the RBS-specific features.

2.2.3 The Insurance Theory

The Insurance theory is seen as a substitute to the integration theory because it shares the view that RBS assets and liabilities lie completely with the sponsoring company, but additionally pretends that employees may share the ownership of any RBS deficit or surplus with the shareholders of the sponsoring company in the form of respectively put or call options. Consequently, companies switch decisions represent their exercise of a ‘default’ option (Klumpes et al., 2003).

Bodie (1990a) views pensions offered under DB schemes as an insurance company subsidiary. The pensions offered under these schemes are thus viewed as participating annuities that offer a guaranteed minimum nominal benefit determined by the scheme’s benefit formula. This guaranteed benefit is permanently augmented from time to time, at the discretion of management, depending on the financial condition of the plan sponsor, the increase in the living cost of retirees, and the performance of the plan assets; therefore, even after controlling for financial characteristics of the company as identified

by the integration theory, sponsor companies have the option to default on the part of the pension liabilities which is not covered by the pension fund's collateral (Klumpes et al., 2003). So, the switch decisions, based on the insurance theory, are associated with the tendency to default on their pension liabilities by pension scheme sponsors.

2.2.4 Modern Portfolio Theory

Modern portfolio theory (MPT) or portfolio theory was introduced by Harry Markowitz with his paper "Portfolio Selection," which appeared in the 1952 Journal of Finance. 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. Following this advice, a fund manager might conclude that banks stocks all offered good risk-reward characteristics and compile a portfolio entirely from these. Naturally, this would be imprudent. Markowitz formalized this intuition, detailing mathematics of diversification; he proposed that investors focus on selecting portfolios based on their overall risk-reward characteristics instead of merely compiling portfolios from securities that each individually has attractive risk-reward characteristics.

In a nutshell, Fund Managers should select portfolios not individual securities. If we treat single-period returns for various securities as random variables, we can assign them expected values, standard deviations and correlations. Based on these, we can calculate the expected return and volatility of any portfolio constructed with those securities. We may treat volatility and expected return as proxies for risk and reward. Out of the entire universe of possible portfolios, certain ones will optimally balance risk and reward. These comprise what Markowitz called an efficient frontier of portfolios. A Fund Manager should select a portfolio that lies on the efficient frontier.

James Tobin (1958) expanded on Markowitz's work by adding a risk-free asset to the analysis. This made it possible to leverage or de-leverage portfolios on the efficient frontier. This led to the notions of a super-efficient portfolio and the capital market line;

through leverage, portfolios on the capital market line are able to outperform portfolio on the efficient frontier.

Sharpe (1964) formalized the capital asset pricing model (CAPM). This makes strong assumptions that lead to interesting conclusions. Not only does the market portfolio sit on the efficient frontier, but it is actually Tobin's super-efficient portfolio. According to CAPM, all investors should hold the market portfolio, leveraged or de-leveraged with positions in the risk-free asset. CAPM also introduced beta and relates an asset's expected return to its beta.

Portfolio theory provides a context for understanding the interactions of systematic risk and reward. It has shaped how institutional portfolios are managed and motivated the use of passive investment techniques among Fund Managers. The mathematics of portfolio theory is used in financial risk management by Fund Managers and was a theoretical precursor for today's value-at-risk measures.

2.2.5 Arbitrage Pricing Theory

APT was to improve CAPM which is the simplest and most commonly used asset pricing model in finance is a one factor model. It is 'one factor' in the sense that there is only one explanatory variable and that variable is the risk premium of the market as a whole. Its simplicity was hit by Ross (1976) who felt that there must be more than one dimension to asset pricing and by Roll (1977) who claimed that the CAPM is not 'theory' since it cannot be refuted or tested.

In its place Ross (1976) and Ross and Roll (1980) proposed a multi-factor model, the *Arbitrage Pricing Theory* or the APT. Several macro-economic variables are used to explain asset pricing. Whereas the CAPM relates stock returns to only the 'market' in the linear equation

$$R_i = R_o + (R_m - R_o) \cdot \beta_i$$

Where R_m is the market rate of return, the APT model states the asset returns as a risk free return plus a linear combination of factors as:

$$R_i = G_0 + (G_1 - G_0) \cdot B_1 + (G_2 - G_0) \cdot B_2 + \dots$$

Where G_0 can be interpreted as the risk free rate of return and the $(G_i - G_0)$ terms are risk premium demanded for each class of risk defined by the factors.

Empirical tests of the APT have been inconclusive as no researchers could agree on the value of the coefficients of any of the exogenous variables for example studies by Chen, Roll and Ross 1983, Roll and Ross 1980, Kryzanowski et al 1994). For example Kryzanowski et al (1994), show that the explanatory variables are correlated. Efforts to generate orthogonal factors results in one dominant factor and APT models that retain multiple explanatory variables are unstable. No empirical investigation of the APT has produced results that were considered by the researchers to be superior to the CAPM. The entire APT epoch in financial research turned out to be a multi-collinearity dead end.

An important difference between CAPM and APT in the regression portion of the empirical test is that while the CAPM does not require a statistically significant relationship to exist between R_i and R_m (it only seeks to extract whatever covariance that might exist), the APT depends on it. The APT model cannot be built if the regression null hypothesis cannot be rejected. The validity of the linear model is tested with the hypothesis

$$H_0: b_1 = b_2 = b_3 = b_4 = b_5 = 0$$

H_a : At least one of the regression weights is non-zero

This is, of course, statistical. In the APT the entire regression model has to be correct and valid. Thus the hypothesis should have been

H_0 : at least one of the $b_i = 0$ against;

H_a : none of the $b_i = 0$

Only a rejection of this hypothesis will lead to the conclusion that the model is correctly specified - a necessary condition for APT validation. Each of the regression weights should be tested with a t-test with the appropriate Bonferonni type adjustment (That's if the experiment wise error rate are to be kept to a specified level (usually $\alpha = .05$) a

simple way of doing this is to divide the acceptable α - level by the number of comparisons intend to make). If any of the weights are not significantly different from zero, the model is incorrectly specified and the experiment is over thus the conclusion; reject APT

2.3 Historical Development of Retirement Benefit Funds

Langley (2006) trace the earliest RBS fund system to Germany of which the scholar credit former German Chancellor Otto Von Bismarck for enacting a compulsory savings program for workers in large firms who were exposed to the socialism ideologies in 1889. According to Perotti and Schwienbacher (2008) the Bismarck RBS fund system was financed through worker and employer contributions, attracted taxation incentives and paid retirement benefits once the worker reached the age of 65.

RBS fund contributions under this system were invested in financial securities, however this system had no provision for benefit entitlement to personal representatives in case of death, it was mainly restricted to the civil servants and war veterans and many workers, did not live to enjoy the retirement benefits as life expectancy was 60 years (Lindert 1994).

According to Perotti and Schwienbacher (2008), the Bismarck RBS fund system was a “social security program” defined as a “comprehensive retirement program covering many production workers.” Many other countries at different times replicated the Bismarck program for example, Japan 1875, United States 1896, New Zealand 1898, Belgium 1900, Australia 1941, Belgium 1967, Canada 1966, Denmark 1964, Greece 1978 and United Kingdom in 1948 amongst others (Perotti and Schwienbacher 2008).

According to Ambatchsheer (2007), reaction to the political and economic shocks affecting the world prompted the development of RBS fund systems during the Victorian period (five decades prior to the First World War). Over the Victorian period, prices were reasonably stable, with long-term rental contracts and general stability in the financial and political systems in the West and hence there was no need for social or retirement

security; however the First World War caused an inflationary shock, which acted as a catalyst to the changes that were later effected in the financial systems. The resultant loss of jobs, suspension of various currencies and the stock market crisis of great depression of 1929 made governments to enact policies to cater for their working populations which consequently led to the formation of the modern RBS fund systems (Perotti and Schwienbacher 2008).

Times have passed and RBS fund systems developed, and thus the RBS funds have been subject to economic and political shocks affected their sustainability in different countries and so the only institutions that could be trusted to secure retirement funds were the governments; in Germany for example, the Bismarck system was transformed to a Pay as You Go (PAYG) scheme in 1957 funded by the state with France and Finland following suit (Meyer, 2004). However for the African countries, Kenya inclusive, RBS fund systems were developed after independence and the RBS fund models that were being used by their colonial masters were adopted (Ahmad 2008).

2.4 Retirement Benefit Schemes Fund Systems in Kenya

Earlier Kenyan Retirement Benefit Scheme first came into being after independence, this being the first post independent Retirement Benefit Scheme fund body, dubbed the National Social Security Fund (NSSF), which was established in 1965 (RBA 2000).

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, which oversees the 1997 RBA Act that brought about regulation, protection and structure to the Retirement Benefit Scheme

fund industry. The RBA continues working to develop the industry and advise the government on Retirement Benefit Scheme policy reforms.

The Kenyan Retirement Benefit Scheme fund system has four components: NSSF; Civil Servants Pension Scheme (CSPS); Occupational Retirement Schemes (ORS); Individual Retirement Schemes.

National Social Security Fund (NSSF)

NSSF is a public provident fund (pays benefits as a lump sum) that covers an estimated 800 000 members in both the formal and informal sectors and contributions to NSSF are mandatory for employees in firms with 5 or more employees, whereby members contribute 5% of their monthly earnings subject to a maximum of Ksh. 200 that is matched by an equal contribution by the employer ; however RBA allows the employees to contribute more on voluntary basis to a maximum of Ksh. 1,000 per month and that the old-age Retirement Benefit Scheme benefits are available to those aged 55 who have retired from active employment (Stewart and Yermo 2009).

Civil Servants Pension Scheme (CSPS)

This component caters 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).

Occupational Retirement Schemes (ORS)

In a bid to accumulate retirement savings for their employees, ORS were established and in Kenya ORS are operated on Defined Benefit or on Defined Contribution Retirement Benefit Scheme structures though for Kenyan case, the Defined Contribution is the predominant design; even though it is not mandatory for employers to set up the ORS, once established, the fund falls under the mandate of the Retirement Benefits Authority and thus must comply with the laid down regulations. The ORS are estimated to cover an estimated 3% of the working population in Kenya (RBA 2008).

Individual Retirement Schemes (IRS)

This Retirement Benefit Scheme component, the 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. 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).

2.5 The Retirement Benefit Schemes Designs

RBS can either be a Provident Fund or a Pension Scheme, either of which can be a Defined Benefit or a Defined Contribution, either of which further can be a Segregated or a Guaranteed fund (Besley and Prat 2005).

Pension fund design is an institutional framework under which pension fund issues are regulated, which guarantees that pension promises are met; The two possible pension fund designs are the defined benefit (DB) and defined contribution (DC) (Besley and Prat 2005); while a Provident fund on the other hand is a RBS that is similar in structure to a DC but different in that payout at retirement is a lump sum; that is provident fund benefit is fully available in cash to the member at retirement (TDPK, 2011). In a provident fund what's is defined is the employer and employee contribution (if any) as defined in the RBS trust deed and rules, or the collective agreement, however, what's not defined is the benefit as it unknown until retirement and that benefits depends on value of contributions, investment earnings and annuity purchase rates(TDPK, 2011).

DB scheme is one that defines or specifies the benefits payable on retirement, while a DC pension fund is one that defines or specifies the contributions payable to the pension fund over the years that the employee is in service (Besley and Prat 2005). According to Ghilarducci and Terry (1999), the fundamental difference between DC and DB therefore, is the determination of the benefits.

Owing to their nature, DB schemes are more susceptible to employer control as opposed to employee influence (Besley and Prat 2005).

The benefits payable under the DB pension structure as clarified by Odundo (2006) is determinable through the formulac:

$$\frac{1 \times \text{Years of service} \times \text{Salary}}{\text{Pension factor}}$$

Where:

Salary is the final salary or an average of the last three years' salary;

Pension factor is the amount of income replacement that the sponsor is willing to provide for employees in retirement and is usually advised by an actuary.

Davis (2000) on clarifying on the difference between the DB and DC suggests that with the DC, the returns to members are purely dependent on the market while the employer guarantees those of the DB. Further, DB funds have insurance features in respect of replacement ratios (pensions as a percentage of income at retirement) subject to the risk of bankruptcy of the employer as well as potential risks for transfers between older and younger beneficiaries which are absent in the DC funds and it is also worth noting that DB pension funds are more expensive to operate compared to the DC (Davis 2000).

According to Odundo (2006), the predominant design in Kenya is the DC scheme and points out that by the end of close of 2006 only 30% of the pension funds operated as DB mostly in the public organizations, quasi-public enterprises and big private multinationals. Odundo (2006) further shows that the key problems affecting the DB were the restraints that they impose on job mobility (employers restrict pension withdrawal when the employee leaves employment), high costs of operation, many of them are non-contributory (only the employer contributes to the scheme), many of them were under- funded, high default risks from the employer and the failure to separate pension fund assets and liabilities with those of the sponsor.

However, Odundo (2006) points out that several pension funds in Kenya are converting their designs from DB to DC or hybrid schemes and thus to smooth the progress of these

conversions, the Kenyan RBA (2006) has set specific guidelines which include triennial actuarial review; sponsors to seek approval from RBA trustees to pass a documented resolution; only funded DB to be converted; members to be educated and must give consent; and the importance of a condition that members must not lose benefits due to conversion.

2.6 Fund Managers

Rono L, (2009) points out that the fund managers investing the Retirement Benefit Scheme funds are governed by the Retirement Benefits Act which spell out guidelines on the boundary of exposures for each asset class it trades in. According to Rono L, (2009) in referring to the Retirement Benefits Act, (1997) identifies that this act required all Retirement Benefit Scheme to have a sensible investment policy in line with the investment guidelines provided there in and to appoint a fund manager to direct and assure trustees in investing Retirement Benefit Scheme funds.

The Fund Managers are Retirement Benefit Scheme players whose responsibility is to advise the trustees in the making of investment decisions of the fund, (RBA 2008). According to Ahmad (2008), Fund Manager's responsibilities include: Monitor and manage investments (stocks, bonds and real estate) to meet the investment goals and objectives of the pension fund; Assist the trustees to prepare a statement of investment policy in line with their expected risks and returns; Report to the trustees the periodic returns generated by the pension fund; Ensure adequate, affordable and sustainable benefits to contributors; Secure safety and security of funds; Ensure adequate liquidity to pay all pension benefits as and when they fall due and Achieve optimal trade-offs of risk and return through strategic asset allocation.

2.7 Persistency of Fund Performance

The persistence of a fund performance represents the extent to which the fund manager is able to generate consistently performance over time. That is, fund performance is said to persist when the fund belongs to the winner group (e.g., a superior performance lying above some estimated median performance level) over several periods of time.

Specifically, performance persistence captures two dimensions of fund management, namely the ability to generate excess return as compared to a given benchmark portfolio (e.g., manager skills such as market-timing ability and stock picking ability), and the ability to maintain performance over time (e.g., to do better than other competitive managers or to be outperforming through time) (Tonk, 2003).

Tonk (2003) identifies approaches for measuring performance persistence, as contingency tables (e.g., counting the number of time periods with outperforming returns), regression studies (assessing the impact of past fund alphas on current fund alphas), and finally funds' ranking based on appropriate performance measures (e.g., appraisal ratio, modified Sharpe ratio, Park ratio, alternative investment risk-adjusted performance).

While using the measurement approaches, current academic and empirical research has identified and exhibited key features of performance persistence. First, a short-term persistence up to 1 year has been acknowledged with stronger evidence up to a 3-month horizon. Indeed, some funds exhibit a short-term positive correlation in their respective abnormal returns (i.e., risk-adjusted returns or positive alphas) over subsequent time periods. Second, the persistence of fund performance can be explained by a set of key security-based factors such as size (i.e., market capitalization), value, momentum (e.g., short-term past performance), fees and expenses (e.g., management and incentive fees, performance fees, load charges, operating fees, transactions costs), and investment style (e.g., aggressive and/or conservative investments focusing on aggressive growth, growth, growth and income, balanced or income securities among others) as well as related style consistency.

2.8 Measurement of Fund Managers Performance

Assessing the whether a fund manager who has performed well in one period can repeat this feat in subsequent period's calls for employing a measurement instrument or rather a model that will give a representative outcome. Tonk (2003) identified a model that can be employed in the computation of the performance persistency of fund managers of pension

schemes that they employed in assessing performance persistency in the UK pension market, comparatively the French and Fama (1993) model. This model inputs would include datasets of the returns on pension funds managed by fund managers, and so to examine the persistency in performance of a specific fund manager need to obtain a measure of the performance across all the funds under his management. This is achieved by averaging abnormal returns across the funds under management to a particular fund manager. This averaging across pension funds is both equally weighted and weighted by fund size, since it could be argued that fund managers put greater effort into managing larger funds. Blake *et al* (1999) has difficulty distinguishing between fund performance and fund size, but this difficulty of interpretation is less important with the average performance of the funds under management.

There are a number of tests for persistence, and recently Carpenter and Lynch (1999) have assessed the power of these difference tests particularly in the presence of different types of survivorship bias, and further classify persistence tests into two types: performance ranked portfolio strategies, and contingency tables. Fund manager performance is measured as the average abnormal returns on the funds under management, where the abnormal returns AR_{P_t} for each pension fund P are computed from an asset-pricing model.

Alternative asset pricing models are the Fama-French three-factor model and the single factor CAPM, where the factor loadings are estimated over the whole sample period. In the three-factor model the standard three factors are the excess return on the market $R_{mt} - r_{ft}$, the returns on a size factor SMB_t which is the difference between the returns on a portfolio of small companies and a portfolio of large companies, and a book-to-market factor HML_t which is the difference in returns on a portfolio of high book-to-market companies and low book-to-market companies.

$$AR_{P_t} = R_{P_t} - r_{ft} - \beta_P (R_{mt} - r_{ft}) - Y_P SMB_t - \lambda_P HML_t \dots\dots\dots (1)$$

In the case of the CAPM let $Y_P = 0$.

Calculating the abnormal returns involves a two step procedure:

First regress returns on the factors to produce the factor to estimate the regression parameters;

Secondly, calculate the abnormal return on each fund.

The abnormal returns in equation (1) relate to the performance of a pension fund P , managed by fund manager F . To obtain a measure for the performance of fund manager F , the abnormal returns from equation (1) relating to pension fund P of the pension funds managed by fund manager F are averaged for each fund manager and for each quarter.

Performance ranked portfolio tests sort fund manager each period into portfolios based on past performance. Over an initial period, called the ranking period, the performance of fund managers are compared and ranked. The ranking period can either be one-quarter, four quarters (one year) or twelve quarters (three years). This averaged abnormal return across pension funds is attributed to the skills of fund manager F in the ranking period. Fund managers are ranked on the basis of the average return on the funds under management in the ranking period, and portfolios are formed on the basis of this ranking, with equal numbers of fund managers in each portfolio. The top portfolio consists of those fund managers with the highest average abnormal returns in the ranking period, down to the bottom portfolio with those fund managers with the lowest average abnormal returns.

Then follows the computation of the equally weighted average portfolio abnormal return of the top and bottom portfolios over a subsequent evaluation period, which can be denoted as denote $AV5(\tau)$ and $AV1(\tau)$ respectively, where τ denotes the particular evaluation period; the ranking, period is then advanced by one period and repeat the ranking process and subsequent evaluation. This gives the average abnormal returns $AV5$ and $AV1$ of the top and bottom portfolios, in the evaluation periods, averaged over all evaluation periods. The evaluation period can also be one quarter, one year or three years. These procedures are followed for overlapping periods throughout the full period of the dataset, and then compute DIF as $AV5-AV1$, and then report TDIF, which is a t-statistic on DIF, which is calculated after allowing for the autocorrelation induced by the

overlapping observations. Under the null hypothesis of no persistence the value of DIF should be centered on zero, which would mean that past performance is no predictor of future performance. From simulations, Carpenter and Lynch (1999) find that the persistence test based on TDIF is the best specified under the hypothesis of no persistence, and the most powerful against the alternatives considered.

2.9 Review of Empirical Studies

Brown and Goetzmann (1995) examined the performance persistency of US mutual funds and found that the persistency is mostly due to funds that lag the S&P. The study established that relative performance pattern depends on period observed and is correlated across managers, suggesting that that persistency is probably not due to individual managers; it is a group phenomenon, due to a common strategy that is not captured by standard stylistic categories or risk adjustment procedures. This is in agreement with herding theories of behavior (Grinblatt and Titman 1992) which suggested that the market fails to discipline underperformers, and their presence in the sample contributes to the documented persistence.

Carhart (1997) in studying Persistence in Mutual Fund Performance established that common factors in stock returns and investment expenses explain persistence in equity mutual funds' mean and risk-adjusted returns. The only significant persistency not explained, is concentrated in strong underperformance by the worst return mutual funds though results do not support the existence of skilled or informed mutual fund portfolio managers.

Brown, Draper and McKenzie (1997) examined the consistency of UK pension fund performance, and established inadequate evidence of consistency in performance for a small number of fund managers. The sample consisted of 232 funds 1981-90 and 409 funds 1986-92, and the study constructed the sample of funds from those that retained the same single fund manager over the time-span of their dataset and found that this limited consistency holds over different time horizons, samples and classification schemes,

though this finding seems to be influenced by the out-performance of one particular fund manager.

Blake, Lehmann, and Timmermann, (1999) also examined persistency of long-lived pension fund with a sample of funds that retain the same fund manager, although the study finds evidence of persistence in fund returns for UK equity portfolios at the one-year horizon, the study points out that the persistence results are entwined with an inverse relationship between fund size and fund performance and conclude that when an allowance is made for fund size “these regularities [of persistence] are second order”

In studying UK pension funds Blake *et al* (1999) finds that the pension fund have the same single fund manager over the length of their respective samples but notes that this specification of the dataset may have induced survivorship bias in these data samples, since pension fund may have continued to hire the same fund management house, because their performance has satisfied the pension fund trustees, and not triggered their removal. Survivorship bias can affect performance evaluation in two opposite ways. In clarifying, Brown, Goetzmann, Ibbotson and Ross (1992) advise that if fund volatility is steady across time, but varies cross-sectionally, and if the worst performing funds in a period disappear, then survivorship will induce false persistence and bias persistence upwards. However, Grinblatt and Titman (1992) in the contrary opine that if fund survival depends on average performance over several periods, then survivorship induces false reversals: first period losers must subsequently win in order to survive, and this biases persistence downwards.

Grinblatt and Titman (1992) in a study of monthly mutual fund returns and performance evaluation techniques find that differences in mutual fund performance between funds persist over 5-year time horizons and this persistence is consistent with the ability of fund managers to earn abnormal returns.

Further, Hendricks, Patel and Zeckhauser (1993) analyzed the short-term relative performance of no-load, growth orientated mutual funds, and found the strongest evidence for persistence in a one-year evaluation horizon.

In Kenya, studies have also been done on matters related to performance of fund managers though not many. Gitundu (2010) in assessing the asset selection and performance evaluation: a case of pension funds in Kenya, revealed that asset allocations differ between various pension funds, an indicator that the criteria for developing the optimum investment mix differ between investment managers of various pension funds, and as well also found out that although performance of pension funds assets is comparable to various market indexes, there is no defined standard performance measure. Some fund managers construct in-house indexes for some assets; others evaluate performance against available economic performance indicators, while others were silent on the performance of the pension fund's portfolio. This study concludes by proposing the development of a standard asset selection criterion and also a performance evaluation index. Rono (2009) in evaluating factors influencing pension fund managers investment decisions in Kenya by analysis 11 fund managers registered as at the period of the study revealed that returns, investment risks and trends in interest rates were the most important factors affecting pension managers' investment decisions. Decision- making preferences, investment portfolio, past performance and legal framework were rated as less important. Persistency and return maximization in the rate of returns (sustainable long term returns), prevailing economic and political situations-inflation, global markets which determines key indicators like interest rates/ exchange and risk profile of the scheme investment (risk assessment of the board of trustees) in that order are also important qualitative factors in decision making for pension fund investment. Rono (2010) on researching on Impact of Retirement Benefit Act (RBA) on Investment Returns to Pension Funds in Kenya by analyzing data relating to 175 trustees and 13 fund managers reveals that annual investment return for retirement benefits schemes in the period RBA was in force ranged between 10 and 27.52%, sometimes falling below the annual inflation and this used to be low before RBA came into force.

2.10 Conclusion

Literature reveals growth in Retirement Benefits funds in Kenya. Fund performance theories include Modern Portfolio Theory, advanced by scholars over the years from the Markowitz (1952), the Arbitrage Pricing Theory as was put forth by Ross (1976) and Roll(1977) in advancement of Sharpe (1964) CAPM. These theories in themselves are evidently not agreeing on the complicity of measurement of performance of fund managers as evidence in advancement of CAPM by APT that as well doesn't come clear on the factors (parameters), thus the need go further and measure performance persistency. Also theories on the retirement funds discussed include: Integration, Separation, and Insurance theories, which shows the ownership and responsibility of the funds between the scheme and the sponsor firms. Various models for measuring the performance persistency of the fund managers have been put forth by scholars. Sharpe (1964) CAPM, Ross (1976) and Roll (1977) APT, Jensen (1968) models have been used over the years. All these models have been supported and not supported by scholars due to varied reasons, number of factors affecting returns, survival bias among other factors.

Studies have been done on the area of pension fund investments giving varied results, some showing existence of performance persistency, but disapproved by other scholars due to not have looked into other factors like survival bias. For example Brown and Goetzmann (1995) identified evidence of persistence on funds that lag the S&P and that this depends on the observed period and correlates across managers. Cohart (1997) on the other hand identified that common factors in stock returns and investment expenses explain persistence in equity mutual funds' mean and risk-adjusted returns but doesn't explain persistency in strong underperformance by the worst return mutual. Brown, Draper and McKenzie (1997) on UK pension funds established inadequate evidence of consistency in performance for a small number of fund managers. Blake, Lehmann, and Timmermann, (1999) also finds performance persistency for short period fund manager investments. Thus, this is a grey area as no conclusive harmony of performance persistency evidence on RBS funds or not amongst scholars.

In Kenya, studies on this area have not been strictly on the performance persistency but rather qualitative studies, which evaluate the factors affecting the fund managers (Rono, 2009), the impact of RBA on fund managers (Rono 2010). Thus this study employed the French and Fama (1993) three factor models in studying the existence of performance persistence among fund managers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This Chapter describes how the study was conducted, expounding on steps and procedures involved in Research Design, Study Population and sample, Sampling Method, Data Collection, Analysis. This chapter as well expounds on the data size, the data collection methods, the instruments involved at each stage.

3.2 Research Design

This section gives the blueprint for this study, highlighting on which questions studied, which data were relevant, what data were collected, and how the results were analyzed. Research Design is a logical and systematic plan for directing a research study. It specifies the objectives of the study, the methodology and techniques to be adopted for achieving the objective(s) (Mugenda and Mugenda, 2003)

The study adopted a Descriptive research design where it examined persistence over time in the performance of fund managers responsible for making the investment decisions of Kenyan pension funds that is; whether fund managers consistently added value to the performance of the funds under their management. Descriptive research design describes systematically the facts and characteristics of a given population or area of interest, factually and accurately (Isaac & Michael, 1977) in which case for this study described the existence or not of performance persistency amongst the RBS fund managers in Kenya. This study adopted this design as subjects (fund managers performances) were being observed in a completely natural and unchanged natural environment (as filed with RBA and the financial statements) and thus no manipulations to warrant an experimental one.

This study sought to analyze the existence of performance persistency of individual fund management firms that have been appointed as fund managers of segregated retirement benefit schemes in Kenya for the period 2006 through 2011.

3.3 Population

The population for the study was 10 Fund Managers fully and consistently registered with RBA for the entire period of study and had met all the requirements of serving as a fund manager for retirement benefit schemes fund in Kenya as enlisted in Appendix 1.

3.4 Data Collection

For the purpose of this study, secondary data was used. These dataset included: The market rate of return where the average return for all the fund managers served as a proxy, the risk free rate of return where the threshold guaranteed rate of return for Guaranteed Funds served as a proxy. Currently this is 4% and has remained steady during the proposed period of study, Returns on portfolio of small companies, Returns on portfolio of large companies, Book value of the companies, Market values of the companies.

The dataset was drawn from the Financial Statements of each of the Fund managers under study throughout the period of study; these Financial Statements usually in copies reside with the Fund Managers, Scheme Trustees, Scheme Administrators and RBA as filed returns. For the purpose of this study, these financial statements will be sourced from the RBA systems and the Fund managers for validity.

3.5 Data Analysis

This study investigated the persistence of fund manager performance; that is; whether a fund manager who has performed well in one period can repeat this achievement in subsequent periods. Data that was analyzed for this study entailed of the returns on pension funds managed by the 10 fund managers (see appendix 1), and so to examine the persistency in performance of a specific fund manager needed to obtain a measure of its performance across all the funds under its management.

This was arrived at by averaging abnormal returns across the funds under management to a particular fund manager which was both equally weighted and weighted by fund size, to curb the notion that fund managers put greater effort into managing larger funds.

This study measured Fund manager performance as the average abnormal returns on the funds under management, where the abnormal returns AR_{P_t} for each pension fund P were computed from an asset-pricing model. It used asset pricing models as put forth by the Fama- French (1993) three-factor model and the single factor CAPM, where the factor loadings were estimated over the whole sample period. In the three-factor model the standard three factors were the excess return on the market $R_{mt} - r_{ft}$, the returns on a size factor SF_t which was the difference between the returns on a portfolio of small companies and a portfolio of large companies, and a book-to-market factor BMF_t which was the difference in returns on a portfolio of high book-to-market companies and low book-to-market companies.

$$AR_{P_t} = R_{P_t} - r_{ft} - \beta_P (R_{mt} - r_{ft}) - \gamma_P SF_t - \lambda_P BMF_t \dots\dots\dots (1)$$

On the second instance; of CAPM let $\gamma_P = 0$. And have:

$$AR_{P_t} = R_{P_t} - r_{ft} - \beta_P (R_{mt} - r_{ft}) - \lambda_P BMF_t \dots\dots\dots (1^*)$$

Two steps were gone through in calculating the returns:

First, regressed returns on the factors to produce the factor loading to estimate the regression parameters;

Secondly, calculated the abnormal return on each fund

Abnormal returns in equation (1) related to the performance of a pension fund P , managed by fund manager F . To obtain a measure for the performance of fund manager F , the abnormal returns from equation (1) relating to pension fund P of the pension funds managed by fund manager F were averaged for each fund manager and for each year.

Also Performance ranked portfolio tests will be used to sort fund manager each period into portfolios based on past performance. Over an initial period, called the ranking period, the performance of fund managers will be compared and ranked. The ranking period will be annual. This averaged abnormal return across pension funds will be attributed to the skills of fund manager F in the ranking period. Fund managers will be ranked on the basis of the average return on the funds under management in the ranking period, and 2 portfolios are formed on the basis of this ranking, with equal numbers of fund managers in each portfolio. The top portfolio will consists of those fund managers

with the highest average abnormal returns in the ranking period, down to the bottom portfolio with those fund managers with the lowest average abnormal returns.

Then computed the equally weighted average portfolio abnormal return of the top and bottom portfolios over a subsequent evaluation period, denoted as $AV5(\tau)$ and $AV1(\tau)$ respectively, where τ denoted the particular evaluation period. Then advanced the ranking period by one period, and repeat the ranking process and subsequent evaluation.

The average abnormal returns $AV5$ and $AV1$ of the top and bottom portfolios, in the evaluation periods, were then averaged over all evaluation periods which in this case were annual. These procedures were followed for overlapping periods throughout the full period of the dataset, and thus computed differences denoted as DIF , as $AV5-AV1$. Under the null hypothesis of no persistence the value of DIF should be centered on zero, which would mean that past performance is no predictor of future performance. The computer aided analysis for this study was done using SPSS v17 and MS Excel.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents analysis information findings to determine the existence of persistency in performance fund manager of retirement benefit schemes in Kenya. Secondary data was collected from RBA archive systems analyzed and findings are presented in table forms as below. To determine the performance persistency regression iterations were done for all the schemes under study to come up with the model parameters that aided in calculating the average returns.

4.2 Data Analysis and Findings

This section outlines a summary of variables under study, schemes versus their fund manager summary, fund managers versus fund values for respective schemes and average incomes per fund manager per year, book to market and size factor summary per year, summary of the average abnormal returns for the respective fund managers and lastly the weighted average abnormal returns for the computation of the DIF used in the predicting existence of the persistence of fund managers over time.

Table 1: Summary of Various Variables under Study.

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
ESTABLISHMENT YEAR	265	58	1947	2005		
Fund Value – 2006	265	8,429,436,049	701,951	8,430,138,000	281,136,966	964,618,965
Fund Value – 2007	265	8,533,986,804	857,196	8,534,844,000	308,603,926	1,026,631,029
Fund Value – 2008	265	8,165,357,732	1,154,599	8,166,512,331	302,775,012	975,282,531
Fund Value – 2009	265	9,091,257,885	1,287,261	9,092,545,146	329,761,601	1,066,337,398
Fund Value – 2010	265	11,625,579,619	1,307,381	11,626,887,000	423,601,675	1,350,493,432
Fund Value – 2011	265	12,241,109,681	398,319	12,241,508,000	417,731,640	1,341,729,340
Income Rate - 2006	265	2.0782	-0.0101	2.0681	0.1977	0.3471
Income Rate - 2007	265	2.459	0.0003	2.4593	0.179	0.3119
Income Rate - 2008	265	2.7161	-0.6826	2.0335	0.1476	0.2988
Income Rate - 2009	265	3.4906	-0.0377	3.4528	0.1763	0.3633
Income Rate - 2010	265	2.5671	0.0004	2.5675	0.227	0.3912
Income Rate - 2011	265	2.7305	-0.1412	2.5893	0.1673	0.3322
Valid N (listwise)	265					

Source: Research Findings

From Table 1, the oldest scheme was established in 1947 while latest in 2005, the table also gives the average fund value for 2006 through 2001 which were used in determining the large firms and small schemes (higher than average proxy for large and vise versa). The table also gives the maximum and minimum values for the yearly fund values, yearly income rates, and their respective standard deviations. In total 265 schemes were studied, 10 fund managers.

Table 2: Schemes versus Fund Managers

Fund Manager	Schemes
A	73
B	49
F	42
E	27
I	20
C	13
H	13
J	13
L	10
G	5
Grand Count	265

Source: Research Findings

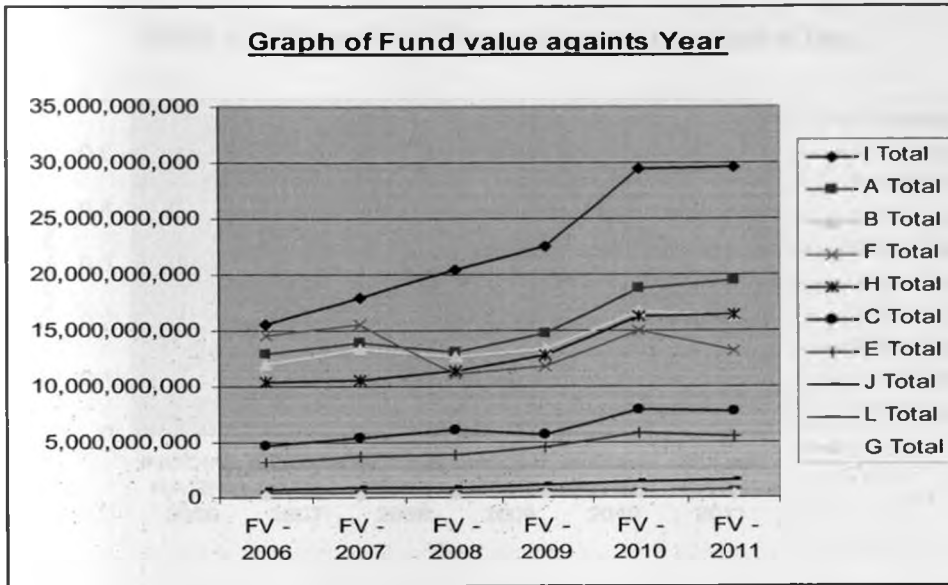
From table2 , the study looked in to 265 segregated pension schemes, under 10 schemes as coded with fund manager code A having the highest number of schemes of 73 and Fund manager G with the least at 5 (see Appendix 1 for the fund manager codes).

Table 3: Fund Managers and Total Fund Values under Management per Year

Fund Manager	FV - 2006	FV - 2007	FV - 2008	FV - 2009	FV - 2010	FV - 2011
I Total	15,575,733,697	17,924,608,188	20,453,350,669	22,496,751,367	29,442,363,026	29,650,758,403
A Total	12,941,913,157	13,930,309,942	13,037,954,840	14,788,614,994	18,818,268,490	19,468,751,389
B Total	11,887,748,325	13,284,607,814	12,684,488,400	13,361,136,459	16,719,777,332	16,282,666,786
F Total	14,611,503,404	15,523,132,210	11,166,686,624	11,871,771,500	14,942,376,088	13,158,273,270
H Total	10,453,908,828	10,602,764,499	11,348,737,237	12,827,366,989	16,257,331,079	16,360,483,725
C Total	4,693,903,471	5,464,764,207	6,161,384,183	5,703,016,400	7,958,133,052	7,735,501,086
E Total	3,210,606,824	3,724,306,111	3,870,803,139	4,545,023,769	5,823,914,785	5,569,017,515
J Total	647,666,695	770,065,852	860,826,265	1,058,023,410	1,395,680,930	1,468,781,631
L Total	348,537,224	403,240,043	467,104,755	517,385,047	600,588,126	666,522,906
G Total	129,774,496	152,241,500	184,042,125	217,734,272	296,011,068	338,127,852

Source: Research Findings

Fig 3: Graph of Fund value against Year



Source: Research Findings

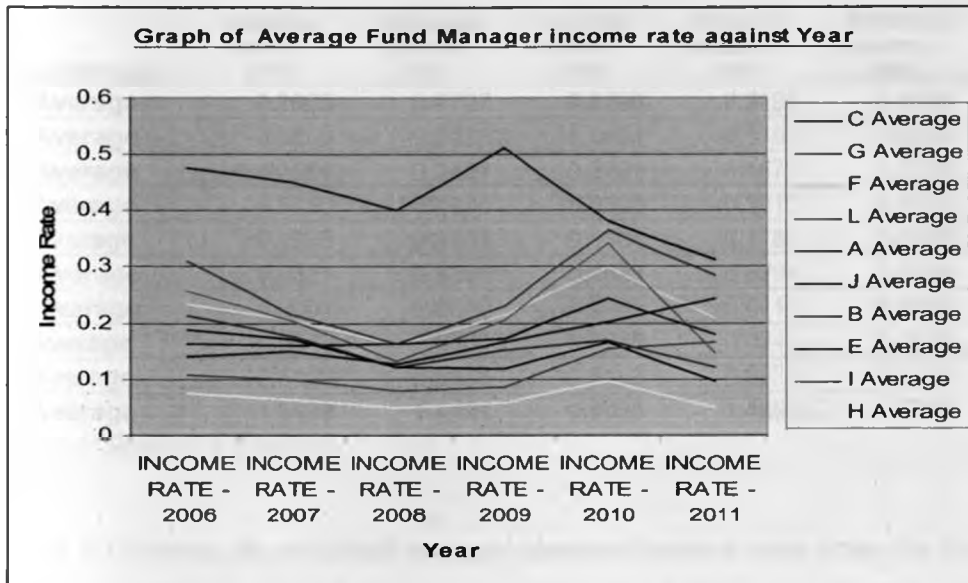
Table 3 shows the total fund values per year under management by each Fund manager with Fund manager I leading through out the study period and G managing the least funds through out the study period. From fig 3 it's evident the funds under particular manager has been increasing for most of the fund managers over the years. A trend worth noting is the stagnating or downward trend in the fund values under particular fund manager during of towards 2008, a case that can be attributed to the global economic crunch of 2008.

Table 4: Average Income per Fund Manager per Year

Fund Manager	INCOME RATE - 2006	INCOME RATE - 2007	INCOME RATE - 2008	INCOME RATE - 2009	INCOME RATE - 2010	INCOME RATE - 2011
C Average	0.4757	0.4520	0.4004	0.5128	0.3807	0.3127
G Average	0.3104	0.2150	0.1624	0.2296	0.3647	0.2835
F Average	0.2327	0.2053	0.1594	0.2116	0.2981	0.2061
L Average	0.2578	0.2054	0.1322	0.2045	0.3428	0.1462
A Average	0.1622	0.1602	0.1627	0.1726	0.2438	0.1793
J Average	0.1405	0.1482	0.1284	0.1657	0.2014	0.2424
B Average	0.2133	0.1782	0.1217	0.1531	0.1676	0.1213
E Average	0.1874	0.1710	0.1221	0.1201	0.1660	0.0964
I Average	0.1087	0.1008	0.0809	0.0859	0.1536	0.1660
H Average	0.0735	0.0633	0.0505	0.0583	0.0970	0.0486

Source: Research Findings

Fig 4: Graph of Average Fund Manager Income rate against Year



Source: Research Findings

Table 4 show the average income as declared to the schemes under its management for each year (see appendix 5 for computations). From the table, on average over the study period, fund manager C declared the highest in average with the least being fund manager H. fig 4 however shows a downward trend in the average income rates for the fund managers, especially in 2008 when most fund managers hit their all time low for the study period. This can be attributed to the global financial crunch in that year.

Table 5(i): Average Abnormal Returns for each Fund Manager (when $y \neq 0$)

Fund Manager	Abnormal Returns - 2006	Abnormal Returns - 2007	Abnormal Returns - 2008	Abnormal Returns - 2009	Abnormal Returns - 2010	Abnormal Returns - 2011
A Average	0.1365	0.1380	0.1490	0.1795	0.2951	0.2513
B Average	-0.0813	-0.0980	-0.0924	-0.1115	-0.0670	-0.1109
C Average	0.2169	0.2061	0.2402	0.1232	0.1963	0.1650
E Average	-0.3969	-0.3682	-0.2781	-0.3128	-0.3957	-0.2602
F Average	-2.9126	-2.3970	-1.9943	-2.8998	-3.8299	-2.5214
G Average	0.5596	0.3462	0.2672	0.3602	0.6760	0.5556
H Average	0.0008	-0.0054	-0.0110	-0.0117	0.0136	-0.0240
I Average	0.0155	0.0226	0.0097	0.3286	0.0973	0.0267
J Average	-0.3648	-0.3882	-0.3529	-0.4506	-0.5420	-0.6788
L Average	1.0681	1.0039	0.7119	1.1022	1.9358	0.8512

Source: Research Findings

Table 5(ii): Average Abnormal Returns for each Fund Manager (when $y=0$)

Fund Manager	Abnormal Returns - 2006	Abnormal Returns - 2007	Abnormal Returns - 2008	Abnormal Returns - 2009	Abnormal Returns - 2010	Abnormal Returns - 2011
A Average	0.2685	0.2727	0.2796	0.3193	0.4936	0.4032
B Average	-0.0859	-0.1026	-0.0951	-0.1153	-0.0699	-0.1134
C Average	0.2584	0.2421	0.2721	0.1673	0.2172	0.1907
E Average	-0.5159	-0.4734	-0.3508	-0.3815	-0.4926	-0.3110
F Average	0.1905	0.1633	0.1104	0.1785	0.2520	0.1560
G Average	0.9321	0.5886	0.4628	0.6294	1.0569	0.8523
H Average	0.0001	-0.0009	-0.0152	-0.0114	0.0137	-0.0175
I Average	-0.0012	-0.0032	0.0046	-0.0246	0.0530	-0.0116
J Average	-0.5118	-0.5553	-0.5165	-0.6638	-0.8250	-1.0009
L Average	1.5469	1.4491	0.9698	1.4866	2.5879	1.1283

Source: Research Findings

Table 5 (i) shows the weighted averaged abnormal returns when using the French Fama model ($y \neq 0$) for each fund manager (see appendix 4 for computations), and table 5(ii) shows the same when using the CAMP model i.e.: ($y=0$) (see appendix 5 for computations), this is after using the parameters, computed after regressing each scheme's income rate against the excess returns, size factor and book to market factor which were then used to calculate the abnormal returns for each scheme. These were then averaged all the schemes under a particular fund manager through out the study period to arrive at the tables above respectively.

Table 6(i): AV5 and AVI (French Fama Three factor Model where $Y_P \neq 0$)

Ranked Portfolio Av. Returns	2006	2007	2008	2009	2010	2011
AV5 (τ)	0.3993	0.3434	0.2756	0.4188	0.6401	0.37
AVI (τ)	-0.7509	-0.6514	-0.5457	-0.7573	-0.9642	-0.7191
DIF	1.1503	0.9947	0.8213	1.176	1.6043	1.089

Source: Research Findings

Table 6(ii) AV5 and AVI (CAPM Model where $Y_P = 0$)

Ranked Portfolio Av. Returns	2006	2007	2008	2009	2010	2011
AV5 (τ)	0.6393	0.5432	0.4189	0.5562	0.9215	0.5461
AVI (τ)	-0.2229	-0.2271	-0.1946	-0.2393	-0.2641	-0.2909
DIF	0.8622	0.7702	0.6136	0.7956	1.1857	0.8370

Source: Research Findings

Table 6(i) and Table 6(ii) shows the equally weighted average portfolio abnormal return of the top and bottom portfolios over subsequent evaluation period, in this case denoted as AV5 (τ) and AV1 (τ) respectively, where τ denotes the particular evaluation period (i.e. $\tau = 2006, 2007, 2008, 2009, 2010, \text{ and } 2011$); the ranking, period is then advanced by one period and repeat the ranking process and subsequent evaluation. This gives the average abnormal returns AV5 and AV1 of the top and bottom portfolios, in the evaluation periods, averaged over all evaluation periods.

The difference between AV5 and AV1 denoted as DIF were found to be positive values, and not centered zero for both French Fama and CAPM model (where $Y_P = 0$), thus there exists a persistency in performance of the fund managers of retirement benefits in Kenya.

4.3. Summary and Interpretation of Results

The project analyzed 265 schemes that maintained the same fund managers for the six year period as reported on Table 1 as analyzed by 10 funds as managers on table 2. All the schemes studied were duly registered throughout the study period with the oldest scheme was established in 1947 while latest in 2005.

There's been a steady growth in the fund values managed by respective fund managers over the study period as reported in table 3 and graph 3 with Pinebridge Investment East Africa Company Limited leading in terms of fund value managed and British American Asset Managers managing the least of the Kenyan retirement benefit fund of the fund managers studied.

However it can be noted that fund managers who's portfolio is huge in terms of fund value declares dismal income rate on average, case in point is manager of huge funds, Pinebridge Investment East Africa Company Limited declare small rate, and British American Asset Managers second in the average income rate declared as reported on table 4 and graph 4 but of low total fund value, an indication of inverse relation of amount of fund value managed and the rate of income declared at the end of the year. This is in agreement of Blake, Lehmann, and Timmermann, (1999) finding that revealed that persistence results are entwined with an inverse relationship between fund size and fund performance

Regression to compute the models factor loading coefficients, the difference in book to market returns factor difference in returns on a portfolio of high book-to-market companies and low book-to-market schemes as in Appendix 3 were used in regression to compute the standardized parameter coefficient for the for the BMF factor that was later in the analysis used as one of loaders in computing the abnormal returns for the fund values. As well, as in appendix 2, the difference in returns for the on the portfolio of small and big schemes, of which, the ranking of the portfolios was in terms of those above and below the average fund value which were used in as a factor in regressing the schemes to get the standardized parameters that were used in the computing the fund value abnormal returns.

The results of the persistency tests of fund manager performance for the case of the three-factor model of abnormal returns are reported in Table 6(i) and for CAPM model on table 6(ii) from which it reports existence of persistency as the values of DIF are not centered at zero, which is an hypothesis of no persistency (Tonk, 2003) , DIF is the return to an arbitrage portfolio, which has been constructed by going long in the high portfolio (AV5) and short in the low portfolio (AV1).

The fund manager performance ought to be computed by taking the equally weighted average Abnormal return of the pension funds under management in a particular year, as a measure of the fund manager's performance in that year but Myners, (2001), criticizes this approach that fund managers will give a better service to larger pension funds, since if fees are based on the value of assets under management; that is the larger pension funds are paying a higher fee to the fund manager, therefore this study computed an alternative measure of fund manager performance as the average performance of funds under management weighted by the fund size for the year (Tonk,2003). The results of this alternative measure of fund manager performance, still based on a three-factor model of pension fund and the CAPM model as averaged from the abnormal returns of each of the schemes calculated from the model, now with the parameter of the factor loadings. Thus as far as the DIF is a positive and not centered at zero it can be concluded that there exists a performance persistency in the performance of the fund managers of the Kenyan retirement benefit and thus a past performance can be a predictor of a future performance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Fund managers make investments decisions and invest the schemes funds in an array of investment vehicles ranging from property, government securities, quoted shares, unquoted shares, corporate bonds, offshore investments, guaranteed funds among many others and declare income rate at the close of specific period, usually per annum; this income rate being the proportion of the accumulated incomes over the fund value of the scheme under management of a particular fund manager.

Main aim of this project was to establish evidence of performance persistence of fund managers over a span of time, this study having chosen to look at a six year time horizon of between 2006 through 2011 in the performance of fund managers' responsible for investments of Kenya Retirement Benefit Funds on behalf of the Trustees and the Scheme members. To understand the background of this, the study looked at literature that explained on this area, theories and past empirical studies that focused on performance persistency of funds; mutual funds and retirement benefit funds; the studies giving harmonious and disputing outcomes, a point attributed to, the datasets used in analysis, assumptions made and methodologies used

After a rigorous analysis, the study found evidence of performance persistency of retirement benefit fund managers in Kenya where it analyzed a data set of 265 segregated retirement benefit schemes as managed by 10 fund manager where the schemes never changed the fund management company through out the study period which was a control over the companies that hop fund managers. In analysis, the study used the French and Fama model and CAPM model in computing each of the 265 schemes abnormal returns by regressing each schemes income rate with the excess market return, size factor and the book to market factor to obtain the standardized parameters for the above models which were then used in calculating the abnormal returns for the each of the schemes which were further averaged for each fund managers. Data was provided by

RBA. However this study propose further studies on this area especially for the schemes that hop fund managers; also suggest including the cost factor in the analysis. Also look at other factors that affect returns and not only the excess market return, the size factor and the book to market factor.

5.2. Conclusion

With the emergence growth in the Kenyan retirement benefit scheme as evidenced from the study findings and existence of fact that a past performance can serve a predictor to a future performance by the fund managers, from a large sample of segregated retirement benefit funds, suggest for a renewed energy in a role for active and close fund management of retirement benefit funds.

This project has measured the abnormal returns generated by fund managers in managing the retirement benefit fund portfolios of Kenyan retirement benefit funds over the period 2006-2011 and has found evidence of persistence in the performance of fund managers at the one-year time horizon DIF persistency tests, which Carpenter and Lynch (1999) identifies as most powerful in detecting persistence in performance.

The finding of this study is consistent with similar studies in the UK that employed the same methodology and ascertained existence of persistency in performance of fund managing houses of retirement benefit funds for example Brown and Goetzmann (1995) identified evidence of persistence on funds that lag the S&P and that this depends on the observed period and correlates across managers, a case that was confirmed by Tonk(2003) which examined persistence over time in the performance of fund managers responsible for making the investment decisions of UK pension funds using a large sample of pension funds over the period 1983-97.

In Kenyan, it also agrees with Gitundu (2010) findings which assessed the asset selection and performance evaluation: a case of pension funds in Kenya, revealed that there was consistency in retirement benefit fund management, although, pointed that performance

of pension funds assets is comparable to various market indexes, but there is no defined standard performance measure.

However this results conflicts with the evidence presented in the Myners(2001) which found no evidence of performance persistence among the UK retirement benefit fund managers and suggests that selecting managers according to past performance figures first and brand second is widely acknowledged to be a poor way to select a manager.

5.3 Policy Recommendations

From the study findings, it can be observed that there exists a significant level of persistency in the fund managers' performance in the investment of varied scheme funds under their management and hence a past performance can be used to predict a future performance of the fund managers of the retirement benefit funds for the Kenyan market.

Therefore, this report project identifies retirement benefit sector as a key area in an economy of any country as it is an important avenue for old age lifestyle of a nation and hence recommend that it should be closely monitored, as a past performance of the fund managers determines the subsequent period performance, so that in case of a poor performance the players in the retirement benefit sector of the economy (Trustees, RBA, etc) should seek to know the problem and correct as soon to evade poor future income returns and thus damage in this key sector as it determines the livelihood of the old cohort of a nation.

Consequently, the study findings also points out that the fund managers that have huge fund values under their management tend to declare dismal average income rate to the segregated retirement benefit schemes and thus the retirement benefit authority, RBA together with the members, through the trustees especially the large funds be cautious on the fund management companies and try to identify the cause of inverse relation of the fund value under a particular fund manager and the income rate declared. This will save the schemes funds that are being managed by fund managers who have huge fund value

under their care, and thus disadvantage the members and hence eat into the members accumulated retirement benefits.

The fund values under particular fund managers also have been noticed to be growing steadily from 2006 through 2011 (except for during 2008 when it surged, attributive to global economic crunch of the time) meaning that the retirement benefit sector is a fast growing area of the Kenyan economy and thus policies and regulations need to be put in place to be at pace with the fast growth with the sector lest it bursts past regulation and turn detrimental to the members, the Kenyan government has in the recent past put forth and amended existing laws, point in case the amendment of the RBA Act 2007 and having in place RBA Act 2010 and the NSSF Bill in debate stage currently and awaiting enactment by the parliament.

5.4 Limitations of the Study

This study's dataset consisted of the schemes that had been with only one fund manager for the 6 years and thus left out the schemes that hop fund managers, hence it's findings is only a pointer to schemes that maintain fund manager over a period. As this was key for the outcome and results for this study and tandem to the assumption of analyzing schemes that maintained same fund manager over a study period, this can pause a drawback of survival bias, in which a fund manager would tend to report a persistency in performance of funds under its management just because the funds have been with it all that time.

In seeking for the data for the study, from the outset as was put forth in the proposal for this study, it was to source for data from the fund managers systems and other relevant books of records and also from the RBA, but fund manager were skeptical and not willing to provide such data in fear of such data leaking to the competitors as income rate declared to segregated is not a public information and thus had to seek data from one side RBA, hence that bit of independent comparison of the filed data with the authority and as posted on fund managers books was never achieved.

In the models used in the computations of the schemes abnormal returns that were later averaged to attain the average abnormal returns for the fund managers; that is the French Fama Three Factor Model and the CAPM, the study only looked at the *excess returns* in the market, the *size factor* and the *book to market* factor as the only factors that affect the scheme's abnormal returns and thus assuming that no other factors affect the abnormal returns, which might or might not be true, this is a point that cannot be concluded by the this study and hence is open to further research so as to realize there is performance persistence of fund managers in light of other factor loadings to the two models.

In Kenya, there are not clear information from either the RBA or independent firms as to how performance rankings of fund managers is done and thus this study sought this by ranking the fund managers with those above the average abnormal rates being on the above portfolio of companies and those below average being the portfolio of small companies, but if these data existed as they are in developed countries like US (e.g. by S&P500) and UK it could be independently verified.

5.5 Suggestions for Further Research

However the results in this paper, from a large sample of 265 segregated retirement benefit funds, suggest that there exist persistency of performance fund management of retirement benefit funds; the paper has measured the abnormal return generated by fund management houses in managing the funds of Kenya pension funds over the period 2006-2011. The study has found evidence of significant persistence in the performance of fund managers at the one-year time horizon. But this paper has not taken some issues in to consideration.

Nonetheless Restrictions in this study has included using a dataset, with a restriction that only 6 years and above old funds with the same fund manager, but challenge lies in the schemes that switch from one fund manager to another. This poses the notion of survival bias and hence studies should be done that will take care of this.

Also the study have made no allowance for the costs of fund management as some fund managers generate consistent abnormal returns above the benchmark portfolios, but whether these abnormal returns outweigh the costs of active fund management is not an issue that this study has addressed thus future studies need to look into this as it is not clear whether the fund managers with the persistent performance are charging fees that reflect their abilities.

Also future studies need to source data from both the RBA and the Fund Manager to ensure that filed data with the authority is independently comparable, to ensure that the figures filed with the authority are the real figure in the fund managers' books.

Future researches also need to look into other factors that affect the abnormal returns and include them in calculating the abnormal returns and thus not assume that only include the *Excess Returns in the Market*, the *Size Factor* and the *Book to Market Factor* as the only factors.

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APPENDICES

Appendix 1 - LIST OF FUND MANAGERS TO BE STUDIED

Code	Fund Manager
I	Pinebridge Investment East Africa Company Limited
A	Genesis Kenya Investment Management Limited
B	Stanbic Investment Management Services (EA) Limited
H	Old Mutual Asset Managers (Kenya) Limited
F	ICEA Asset Management Limited
C	CO-OP Trust Investment Services Limited
E	Jubilee Financial Services Limited
J	African Alliance Kenya Investment Bank Limited
L	Kenindia Asset Management Company Limited
G	British-American Asset Managers Limited

Source: RBA

Appendix 2 Size Factor (SF_t)

FM Ranking -	Av. Rates – 2006	Av. Rates - 2007	Av. Rates - 2008	Av. Rates - 2009	Av. Rates - 2010	Av. Rates - 2011
A						
Large Companies	0.0090	0.0304	0.0184	0.0181	0.0207	0.0085
Small Companies	0.1865	0.2115	0.1940	0.2061	0.2877	0.2128
SF.t – A	-0.177500	-0.181100	-0.175600	-0.188000	-0.267000	-0.204300
B						
Large Companies	0.0545	0.0266	0.0340	0.0341	0.0775	0.0430
Small Companies	0.2354	0.2035	0.1388	0.1799	0.1878	0.1414
SF.t – B	-0.180900	-0.176900	-0.104800	-0.145800	-0.110300	-0.098400
C						
Large Companies	0.0068	0.0077	0.0063	0.0603	0.1652	0.0219
Small Companies	0.5610	0.4890	0.4333	0.6485	0.4454	0.3656
SF.t – C	-0.554200	-0.481347	-0.426952	-0.588200	-0.280200	-0.343700
E						
Large Companies	0.0380	0.0388	0.0307	0.0338	0.0443	0.0325
Small Companies	0.1994	0.1815	0.1294	0.1271	0.1757	0.1015
SF.t – E	-0.161400	-0.142700	-0.098700	-0.093300	-0.131400	-0.069000
F						
Large Companies	0.0283	0.0367	0.0362	0.0370	0.0592	0.0494
Small Companies	0.2667	0.2334	0.1979	0.2735	0.3728	0.2551
SF.t – F	-0.238400	-0.196700	-0.161700	-0.236500	-0.313600	-0.205700
G						
Large Companies	0.0452	0.0424	0.0232	0.0380	0.0032	0.0019
Small Companies	0.4872	0.3300	0.2552	0.3574	0.4551	0.3539
SF.t – G	-0.442000	-0.287600	-0.232000	-0.319400	-0.451863	-0.351960
H						
Large Companies	0.0773	0.0361	0.0759	0.0563	0.0960	0.0089
Small Companies	0.0728	0.0682	0.0458	0.0587	0.0972	0.0558
SF.t – H	0.004500	-0.032100	0.030100	-0.002400	-0.001200	-0.046900
I						
Large Companies	0.0789	0.0581	0.0712	0.0563	0.0631	0.0928
Small Companies	0.1215	0.1238	0.0842	0.9580	0.1762	0.1904
SF.t – I	-0.042600	-0.065700	-0.013000	-0.901700	-0.113100	-0.097600
J						
Large Companies	0.0613	0.0583	0.0492	0.0624	0.0644	0.0864
Small Companies	0.1642	0.1752	0.1637	0.2116	0.2624	0.3118
SF.t – J	-0.102900	-0.116900	-0.114500	-0.149200	-0.198000	-0.225400

L Large Companies	0.1208	0.0780	0.0437	0.0725	0.1189	0.0510
Small Companies	0.3948	0.3328	0.1913	0.2925	0.4921	0.2096
SF.t - L	-0.274000	-0.254800	-0.147600	-0.220000	-0.373200	-0.158600

Source: Research Findings

Appendix 3: Book to Market Factor

FM Ranking -	Av. Rates - 2006	Av. Rates - 2007	Av. Rates - 2008	Av. Rates - 2009	Av. Rates - 2010	Av. Rates - 2011
A						
Large Companies	0.4457	0.4658	0.4775	0.5595	0.8797	0.7953
Small Companies	0.0478	0.0483	0.0439	0.0551	0.0794	0.0581
BMF.t - A	0.397900	0.417500	0.433600	0.504400	0.800300	0.737200
B						
Large Companies	0.6478	0.5924	0.4173	0.5587	0.5078	0.4710
Small Companies	0.0724	0.0583	0.0258	0.0491	0.0691	0.0427
BMF.t - B	0.575400	0.534100	0.391500	0.509600	0.438700	0.428300
C						
Large Companies	1.6776	1.6080	0.8472	2.7949	1.2131	0.8108
Small Companies	0.1152	0.1052	0.0674	0.0978	0.1310	0.0913
BMF.t - C	1.562400	1.502800	0.779800	2.697100	1.082100	0.719500
E						
Large Companies	0.5464	0.4977	0.3558	0.3850	0.5172	0.3038
Small Companies	0.0618	0.0566	0.0403	0.0445	0.0656	0.0371
BMF.t - E	0.484600	0.441100	0.315500	0.340500	0.451600	0.266700
F						
Large Companies	0.6751	0.5665	0.6481	0.5888	0.7904	0.5932
Small Companies	0.0557	0.0609	0.0261	0.0607	0.0775	0.0513
BMF.t - F	0.619400	0.505600	0.622000	0.528100	0.712900	0.541900
G						
Large Companies	1.2973	0.8333	0.6694	0.8933	1.4546	1.1875
Small Companies	0.0636	0.0604	0.0356	0.0637	0.0923	0.0575
BMF.t - G	1.233704	0.772922	0.633795	0.829581	1.362263	1.129987
H						
Large Companies	0.1034	0.0844	0.0864	0.0837	0.1479	0.0802
Small Companies	0.0256	0.0294	0.0196	0.0288	0.0376	0.0118
BMF.t - H	0.077800	0.055000	0.066800	0.054900	0.110300	0.068400
I						

Large Companies	0.2890	0.2825	0.1794	0.1754	0.2620	0.7887
Small Companies	0.0637	0.0554	0.0494	0.0475	0.0649	0.0561
BMF.t - I	0.225300	0.227100	0.130000	0.127900	0.197100	0.732600
J						
Large Companies	0.4285	0.4613	0.4148	0.5361	0.6680	0.8137
Small Companies	0.0541	0.0543	0.0425	0.0546	0.0615	0.0711
BMF.t - J	0.374400	0.407000	0.372300	0.481500	0.606500	0.742600
L						
Large Companies	1.3373	1.2474	0.8441	1.2807	2.1953	0.9752
Small Companies	0.1379	0.0897	0.0531	0.0849	0.1370	0.0540
BMF.t - L	1.199442	1.157707	0.791030	1.195842	2.058295	0.921160

Source: Research Findings

Table with columns: ID, Name, Income, Expense, Net Income, and various performance metrics (e.g., % Return, Volatility, etc.) for numerous investment accounts.

Table with multiple columns containing numerical data, likely representing a financial or statistical dataset. The table is organized into several vertical sections, with the first section containing the most data points. The data is presented in a grid format with varying column widths and row alignments.

1002	0.0025	0.0027	0.0028	0.0029	0.0030	0.0031	0.0032	0.0033	0.0034	0.0035	0.0036	0.0037	0.0038	0.0039	0.0040	0.0041	0.0042	0.0043	0.0044	0.0045	0.0046	0.0047	0.0048	0.0049	0.0050	0.0051	0.0052	0.0053	0.0054	0.0055	0.0056	0.0057	0.0058	0.0059	0.0060	0.0061	0.0062	0.0063	0.0064	0.0065	0.0066	0.0067	0.0068	0.0069	0.0070	0.0071	0.0072	0.0073	0.0074	0.0075	0.0076	0.0077	0.0078	0.0079	0.0080	0.0081	0.0082	0.0083	0.0084	0.0085	0.0086	0.0087	0.0088	0.0089	0.0090	0.0091	0.0092	0.0093	0.0094	0.0095	0.0096	0.0097	0.0098	0.0099	0.0100
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