# THE EFFECT OF ALTERNATIVE INVESTMENTS ON

# THE FINANCIAL PERFORMANCE OF PENSION FUNDS IN

# KENYA

## BY

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# DECLARATION

I declare that this Research Project is my original work and has not been submitted for

an award of a degree in any other University for examination/academic purposes.

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# DEDICATION

This project is dedicated to my dad; David Mungai, my mum; Lucy Waithera, brother; Daniel Gathege and my late grandmother; Lilian Muthoni Macharia for all their love and support. Without them I would not have scaled any academia height.

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| | |
|---|---|
| APT | Arbitrage Pricing Theory |
| AUM | Assets Under Management |
| CAPM | Capital Asset Pricing Model |
| CMA | Capital Markets Authority |
| CPI | Consumer Price Index |
| DB | Defined Benefit Scheme |
| DC | Defined Contribution Scheme |
| IPS | Investment Policy Statement |
| MPT | Modern Portfolio Theory |
| NASI | NSE All Share Index |
| NSE | Nairobi Securities Exchange |
| OECD | Organization for Economic Co-operation and Development |
| RBA | Retirement Benefits Authority |
| REITs | Real Estate Investment Trusts |
| ROI | Return on Investment |
| TDPK | Trustee Development Programme Kenya |
| USD | United States Dollar |

# ABSTRACT

Pension schemes in Kenya provide income for individuals who attain the retirement age and consequently boost economic growth as well as accelerate domestic savings. The industry is regulated by RBA. They have set guideline limits on investments in asset classes to safeguard against market downturns as well as maximize on the return on investments. Fund managers who manage the assets in the pension schemes have developed a conservative approach in investments by relying heavily on traditional asset classes. This research was descriptive and focused on the effects of alternative investments on the financial performance of pension schemes in Kenya. Secondary data covering a period of 5 years, 2012-2016 was used which was provided by RBA and comprised a population of 442 segregated pension schemes and from which a sample of 90 schemes was selected using stratified sampling technique. Alternative investments were private equity and venture capital, real estate investment trusts, immovable property and private bonds. From the findings, most pension schemes had the largest allocation in fixed income and government securities and quoted equity, with the least allocation in private equity and venture capital and real estate investment trusts. The R-square test indicated that 10.6% of the variations in the return on investments were due to the weights of the asset classes indicating that the weights of the asset classes are one among many factors which contribute to the returns. The regression coefficients yielded a positive relationship between this alternative asset classes and return on investments except private equity and venture capital. The negative relationship could be a result of low uptake of the assets in the pension funds as well as limited knowledge in the investments due to its new nature in the industry.  Implications of the findings suggest that Fund managers and Trustees should therefore deliberate about this alternative asset classes which boost the growth of assets under management as well as increase retirees earnings. Where the level of knowledge in these assets is low, trustees are encouraged to attend the TDPK to gain the relevant knowledge and skills to enable them discharge their fiduciary duties in the management of pension schemes in Kenya. RBA should revise investment caps in property and REITs upwards to encourage investment in alternative asset classes. Further research should also be done on alternative assets covering a longer period of study, that is more than 5 years of study and also include exchange traded derivatives

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

Alternative investments are modern innovations in finance. They are a consequence of evolution of international financial markets and changes in the market, which has led to a search for new allocations of surpluses to achieve desired returns on capital. Alternative investments are broad and include diverse products and services thus no single definition could comprehensively characterize this. It is therefore difficult to state if they are a separate category of assets of a subcategory that already exists in the financial market (Anson, 2006). They enable investors achieve positive returns in spite of volatility in the market due to diversity. This is as a result of proper selection of securities in the portfolio and also manager's professionalism.

There are several theories that underpin portfolio management. The Markowitz/Modern portfolio theory asserts that investors prefer higher levels of returns compared to lower levels and are also risk averse. This is because higher levels allow the investor to spend more on consumption and also, given the opportunity to invest they will go for stocks with the smaller risk. It provides that unsystematic risk can be removed by diversification. The Capital Asset Pricing Model (CAPM) asserts otherwise and measures systematic risk. It predicts the expected rate of return of a security given statistics of the rate of return in the market that is expected as well as considering market risk (systematic risk). The Arbitrage Pricing Theory (APT) however, states that the market return is determined by both fundamental and statistical factors. APT therefore states that the return of a given

security is a linear function of complex factors in the economy common to all securities (Levisauskaite, 2010).

Pension Funds are subject to regulation and in Kenya this is done by the Retirement Benefit Authority. The RBA Act and IPS (Investment Policy Statement) provide the investment guidelines. The IPS creates a framework whereby the Scheme's investment strategies are determined. This is a safeguard against uninformed investment decisions. The IPS must meet the requirements of the RBA Act, CAP 197. In order to increase long term returns in excess of Kenyan Consumer Price Inflation or KCPI (10.28% as at March 2017), this can be achieved through diversification between a wide range of different asset classes including use of alternative investments. Over the years, the Fund managers/Investors of pension funds have relied on investments in traditional/conventional asset classes. Largely this is because the CMA had not provided clear cut guidelines in investment in alternative assets for pension funds. The approval was provided in 2015, allowing pension funds to invest in these assets. Further, with increased uncertainty in the capital and money market, this has facilitated the need for improved diversification.

### 1.1.1 Alternative Investments

The world Economic Forum (2015) notes that alternative investments are assets that do not fall under the traditional classes of assets like cash, stocks or bonds. An alternative asset is a non-traditional asset which has prospective economic value that cannot be in any typical portfolio (Olmo, 2009). The terms 'traditional' and 'alternative investments' will often change based on the organization and changes over time (Anson, 2003). In the 1960s, stocks and actively managed bonds were

considered as alternative investments but that has since changed. Alternative assets are not a separate class of assets but are rather alternative investments in any asset class that already exists.

In Kenya, with respect to pension schemes, these alternative assets are private equity, REITs, derivatives, venture capital and immovable property. This is will be the focus of the study because they are asset classes which are now approved by RBA. While traditional assets were most preferred, alternative investments have been found to bear the following attributes: long term, high risk, or illiquid associated with high returns, diversification benefits, inflation-hedging and scalability. An alternative investment also involves use of alternative strategies. According to ProFund (2012) an alternative strategy is the use of unconventional approaches like leverage and short selling.

Valuation of these assets however poses as a challenge due to their unconventional nature. Verbeek (2009) asserts, these assets tend to be illiquid compared to traditional assets and thus valuation becomes a problem. Therefore, investors considering them should focus on long term horizons. Various forms of valuation strategies include the comparable approach where the market values are estimated through available benchmarks.

**1.1.2 Financial Performance**

Heinz et al. (2010) observed that pension funds have the objective of providing income replacement whereas collective investments are concerned with profit maximization. This means pension funds exist to provide income during retirement that is in the long-term while collective investments are geared towards short term wealth maximization. Despite this and other distinctions, the same performance

measures are used to evaluate performance. Short-term returns on investments conceal this reality; returns are one among many factors that explain the financial performance. Other explanatory factors are administration expenses, management and custody costs, magnitude of contributions as well as member behavior in selecting the retirement age. Generally, there is no guarantee given that short-term competition results in long-term optimal asset allocation (Campbell & Viceira, 2002).

Walker et al. (2010) further argue that pension fund performance should be focused on evaluating the value that is added by the portfolio managers in respect of benchmarks. Performance measures are relative and they need to be compared against passive investment strategies. Therefore, rate of returns are a limited indicator of pension fund performance and they need to measure performance against optimal long-term benchmarks. All measures of performance such as the Sharpe Ratio are relative and need to be compared to benchmarks. Therefore, using benchmarks to determine whether a pension fund is meeting the long term objectives, which is optimal returns to members, is unavoidable.

### 1.1.3 Alternative Investments and Financial Performance

Baker and Filbeck (2013) made observations that investors moved to alternative investments due to low returns in the traditional asset classes. Alternative asset classes facilitated meeting their investment objectives and also to a lesser extent, controlled risk. This therefore meant that they were able to earn higher returns within manageable risks. Anson (2006) confirmed this assertion and concluded that superior performance is as a result of either inclusion of alternative assets in the portfolio as a stand-alone or in part of a portfolio consisting of traditional assets.

According to OECD (2015), alternative asset classes tend to yield better returns but the success of the process requires knowledgeable fund managers to invest and expose the pension funds to more investment risk. Robertson and Wielezynski (2008) also assert that investment in alternative assets yield higher returns but this is at the cost of greater volatility. According to their research, larger allocations of alternative assets provide higher returns over a long period of time. However, due diligence is required in order to pick the right combination of alternative assets as well as determine potential risks. The fund managers and the Trustees are therefore left to determine whether the higher returns are sufficient enough to outweigh the increase in the return variance.

Aberdeen (2017) observed that investing in alternative asset classes has a wide range of benefits to the pension funds, uncorrelated returns and reduced volatility. Real estate in particular has the capability of generating substantial yields. The diverse alternative strategies will generate new sources of alpha in the pension portfolio, reduce risks where the markets are in distress as well as unlock opportunities in any investable universe.

### 1.1.4 Pension Funds in Kenya

Pension funds are institutional investors that involve: collecting, pooling and investing funds which are contributed by sponsors and employees/ benefactors to provide pension entitlements (Davis, 1995a). They provide a means to individuals to accumulate savings to finance their consumption needs during retirement. Pension funds are therefore a nest- egg for retirees. Once individuals attain the age of retirement, the expectation is having secured enough savings sufficient for the

retirement age. It is therefore the objective of the Trustees and Fund managers to ensure that the retirees get value for their money. The objective is to maximize their returns within the risk constraints as well as minimize volatility of the projected member benefits.

The pension industry in Kenya is regulated by the RBA, the statutory government agency established in 1997 under the Retirement Benefits Act.  In the first half of 2016, the retirement benefit funds grew by 6.8 Billion, this is a 0.8% increase of AUM (The Pensioner –June 2016). Initially there was no provision for the Funds to invest in private equity and other forms of alternative investments. New regulations were also introduced in 2016, expanding the classes of assets to investing up to 10% of the assets in private equity funds as well as venture capital funds. This is all under Capital Markets Authority licensing.

According to a report issued by RBA, pension funds exposure to alternative forms of investment such as private equity is relatively low. As at December 2015, private equity accounted for 1% of the pension industry's portfolio. Lack of clear regulations in 2015 can also be attributed to the slow move of the industry to move into the new class of assets. However in 2016, the pension plans in Kenya have gradually been increasing their asset allocation to REITS as well as private equity (The Pensioner – June 2016).

The RBA Act requires all pension funds to be established under an irrevocable trust. The Trustee is in a fiduciary relationship; they hold the assets of the scheme on behalf of others and must always act in their interests rather than the trustees' own. Therefore, in as much as the fund managers are experts, they must always seek

approval to invest from pension trustees who are often unfamiliar with these products, i.e alternative investments (Njiru, 2008).

Pension funds under management in Kenya are projected to rise from USD 1.098 billion by 2020 from USD 293 billion (Africa Asset Management 2020, 2016). Kenyan pension funds have not invested in alternative investments but the growth in assets under management (AUM) and rising liberal regulatory regime in the CMA and RBA Act is now making it possible for them to do so. The changing conditions in the market and the push to provide high returns to the retirees have led to the change in asset class mixes. The alternative assets industry therefore provides an opportunity for higher returns as well as desired diversification.

In addition to the growth of assets under management the market conditions in Kenya have experienced turbulence over the past years and thus Fund Managers have been prompted to consider other asset classes that Pension Schemes could invest in which will maximize the expected returns. Traditional asset classes have contributed to the asset growth and it is therefore expected that exposure of the scheme to alternative asset classes will further increase the returns of the scheme as well as hedging against various risks in the market such as the capping of the interest rates by the Central Bank of Kenya, political upheavals, effects of British exit from the European Union as well as unexpected market downturns. Therefore, Alternative asset classes will provide improved diversification where these assets are uncorrelated with the traditional asset classes (Ashiagbor & Vidal, 2016).

## 1.2 Research Problem

There is mounting pressure in the returns from investment of Pension Assets due to the turbulent market conditions. There is therefore an increasing need to review the investment strategies. The Fund managers as well as the Trustees, in keeping with their promise to the retirees, need to consider new investment classes that are alternative investments (RBA, 2016).

The investment choices are also legally constrained. RBA developed investment caps that act as yardsticks for asset allocations. They are maximum percentages of assets that a pension fund may hold in respect of the total size of the fund. As at $31^{ST}$ December, 2016 this were: Cash and Demand Deposits 5%, Fixed Deposits 30%, Corporate Debt 30%, Government Securities 90%, Quoted Equity 70%, Unquoted Investments 5%, Offshore Investments 15%, Real Property 30%, Guaranteed Funds 100% and Any other asset 5% (Pinebridge Investments, 2016).

In 2015, NASI (NSE All Share Index) experienced a decrease by 14.7%, according to the bourse. The overall market turnover was down by 3%, that is Ksh 209bn. As a result, pension funds have been prompted to reduce the exposure to the NSE. Inflation is also a contributory factor to this step-up, in the year 2015 the CPI (Consumer Price Index) went up to 5.8% and as a result pension schemes posted a net loss of 3.7% despite an average return of 2.1%.Since Trustees hold the Assets in trust, unfamiliarity with the new products is bound to constrain exposure to these high risk assets. This warrants necessary education in order to contextualize the value proposition of moving part of the pension money to other forms of investments. With proper education to the Trustees and calculated investment of pension funds in

alternative investments, is it therefore possible to improve the financial performance of all pension funds?

Listokin et al (2012) carried out a research on U.S Public Pension Funds and Alternative Investments and discovered a lack of consistent practice or structured governance for investments in hedge funds and private equity. The study also examined the cause of increase in alternative investments. Their discovery revealed a negative relationship between returns and management fees which suggested that the size of the fund does not predict successful returns. Anantharaman (2012) did an investigation on the determinants of pension plans and their consequences. The results showed that the pension plans investing in alternative assets have these characteristics; high leverage, performance is volatile as well as poor growth. This pointed to the possibility of pension funds investing in alternative assets to boost their returns. He was also able to discover a non-linear relationship between funding and alternative investments- the funds that are moderately under-funded are most likely to go for alternative investments.

Oluoch (2013) researched on the determinants of financial performance of Pension Funds in Kenya. The factors of interest were Fund Value, Assets, Age and Contributions. She did not however explore the different asset classes. Njeru (2014) looked at the effect of regulation on financial performance. Kiplagat (2014) researched on the effect of Asset Allocation on financial performance of Pension Funds. He explored all Assets in the RBA guidelines but alternative investments were not a key focus. His findings showed that 58% of the variability in returns is due to policy differences in asset allocations of the various funds. The remaining 42% is due to other factors such as timing of investments. This topic will therefore explore the

inclusion of alternative investments in the asset classes of pension funds. Will they improve the financial performance or will they pose as a high risk form of investment? What would happen if the focus is retained on the traditional asset classes such as Government bonds and quoted equities, will the fund managers have locked out the pension funds from higher growth possibilities? The studies undertaken have not attempted to explain the effect of alternative investments on the financial performance of Pension Funds in Kenya. This study will therefore address this research gap and answer the question: What is the effect of alternative investments on the financial performance of pension funds in Kenya?

## 1.3 Research Objective

To establish the effect of alternative investments on the financial performance of pension funds in Kenya.

### 1.3.1 Specific Objectives

Specifically, this study sought to:

i. Establish the effect of the weights of private equity and venture capital, REITs, immovable property and private bonds on the return on investments.

ii. Determine the relationship between the dependent variable and the control variables, where the control variables were weights of cash and fixed deposits, fixed income and government securities, quoted equity and offshore investments. The strength of the relationships was also identified as well as extent to which each of the variables influences the returns on investments, both the alternative asset classes and control variables.

iii.    Establish the effects of the weights of the asset classes on the return on investments based on the size of the pension schemes, which is the fund value.

## 1.4 Value of the Study

Pension Funds in Kenya are increasing in value and to hedge against rising revaluation risks, the Trustees, Fund Managers among other stakeholders need to revisit investment strategies. This study aimed to explore the alternative investment market and what it can offer in terms of returns to the pension funds. The researcher was also in a position to answer the question: are alternative investments sustainable? Can they provide long-term benefits to the retirees? Can all schemes, whether big or small develop the same strategies?

This study benefits the economy in Kenya. Growth in the pension industry in Kenya is likely to spur up growth in the whole economy. A potential area of growth is Debt management. The country's rising debts could be managed by tapping into the multibillion shilling pension funds. If the money is kept in circulation within the country then this will bring long-term benefits.

The Trustees are there to safeguard the interests of the members of the scheme at all times. It is in their responsibility to appoint professional fund managers and as such they will maximize on the increase of the funds through the Fund managers and consequently this informs RBA on revision of or upholding of the investment limits of funds in alternative investments.

The overall benefit of the study is long-term growth of pension funds and security, both psychologically and financially to the retiree. They will be able to reap more

from their savings given that the researcher confirms the proposition that alternative investments have an effect on the financial performance of pension funds in Kenya.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This chapter reviews the existing theories and their key propositions or literature on alternative investments and financial performance and how they inform this relationship. It further covers the empirical studies undertaken by other researchers, both globally and locally.

## 2.2 Theoretical Review

This section will focus us on the theories that explain the behavior of fund managers in asset allocation as well as explain the financial performance of pension funds factored in by alternative investments. Portfolio management is anchored on various theories but this study will be based on a few of those theories which include: modern portfolio theory, capital asset pricing model and arbitrage pricing theory.

## 2.2.1 Modern Portfolio Theory

It is also known as, 'portfolio theory' or 'portfolio management theory'. This is a hypothesis by Markowitz in his paper which was published in 1952, ''Portfolio Selection''. It answers the question, which portfolio is the best? He says that since risk is part of higher returns, investors who are risk averse can always construct portfolios which maximize the expected returns. It is therefore possible to have an efficient portfolio which offers maximum possible return at a given level of risk. An investor always expects less than they bargained for and this deviation can be termed

as risk. A rational investor seeks a small variance or deviation i.e a small risk. When an investor diversifies, the risk is spread across the different asset classes that they have invested in. Markowitz (1952), therefore concluded that the returns of an investor is not much about picking stocks but rather choosing the right combination of stocks. The investor should pick a portfolio from the efficient set, which is a set in which an investor expects to find optimal ones.

The objective of the Fund Managers is to maximize the returns of the different asset classes and their skill in choosing the right mix is vital. The most vital decision in management of any portfolio is the decision of the asset mix. This is where the fund manager makes the decision of proportions of equities and fixed income securities and the mix is dependent on the tolerance of risk and the investor's risk horizon (Chandra, 2009). Further, the investor must make a decision on the proportion of the total fund invsted in risky as opposed to safer assets such as money market securities. It is an important decision in controlling the investment risk.

In Kenya, the fund managers are limited to investing in asset classes that are capped by both RBA and the IPS. Since they are in a fiduciary relationship with the stakeholders of the pension funds, they must always act in their best interest. They must put into consideration the age composition of the fund as well as the daily investment decisions to ensure the fund is liquid to meet current obligations as well as ensure that upon retirement, the retirees have a good return for their savings. We can therefore not underestimate the importance of asset-mix decisions that are championed by the modern portfolio theory.

## 2.2.2 Capital Asset Pricing Model

CAPM was developed by Sharpe (1970). It simplified Markowitz's Modern Portfolio Theory by making it more practical. It is based on the idea that an investor should be compensated for time value of money as well as risk and also based on the hypothesis that the expected returns are predicted using only one factor, which is systematic risk. He therefore identified two types of risks, systematic risk and unsystematic risk. Systematic risk is risk associated with the market while unsystematic risk is usually unique to an asset. While unsystematic risk can be diversified, systematic risk cannot be diversified. This model is used to identify the rate of return required if an asset was added to an already well-diversified portfolio; it considers the asset's sensitivity to systematic risk, often represented by beta in the industry as well as expected returns of the market and the expected return of a theoretical risk-free asset.

The model gives an efficient frontier and provides a risk-free rate from which investors can evaluate the riskiness of an asset and the return. It is a framework for evaluating investor opportunities (Budinger, 1993). Fund managers are agents of the members of the scheme whose performance is measured relative to a benchmark. They are often expected to outperform on an after-fees, risk-adjusted basis. Underperformance in any period is a major disincentive because their fee is based on the scheme's fund value. It is a percentage of the assets under management (AUM). They therefore not only need to protect the scheme's returns but also their reputation. They will evaluate available opportunities of investment and will subsequently select those opportunities and allocate assets using the risk-free rate as a benchmark or a guideline.

The financial performance of the pension funds are benchmarked against the Nairobi All Share Index (NASI) and the NSE 20 share Index. They provide a framework for risk as well as return and also act as a guide for asset allocation. This is a framework that fund managers understand and often acts as a target or useful yardstick to measure pension scheme returns and determinant as to whether they are taking the specified risk.

### 2.2.3 Arbitrage Pricing Theory

It was developed by Ross (1976a, 1976b). It is an improvement of CAPM and considers multivariate factors that affect the rate of return of risky securities. It is a useful tool for measuring the risks or factors that a portfolio is exposed to. Besides determining the correlation of the price of the asset to the excess return on the market portfolio, it also considers the risk premium of other set of economic factors. These factors may include; inflation, Gross Domestic product (GDP), as well as changes in the interest rates.

The economic factors that face a pension fund are determined by the markets where they operate and the investment choices made by the fund managers. The sensitivity of prices to such markets is a key determinant of investment policies. In as much as pension funds are managed by different fund managers, they share economic concerns such as expense patterns and economic conditions. Use of the APT approach has implications on the choice of the investment managers. Where the Trustees of the pension funds are well versed with information and desire for the funds to be invested in specific sectors of the industry, then they will naturally be inclined to go for managers who are experts in this sector. On the other hand, they may also decide to

choose different fund managers where pooling them together gives the desired pattern of sensitivities. This is especially so where trustees opt to have a hybrid pension fund, that is, part of the fund is invested in a segregated set-up while the other is managed by an approved insurer (Roll & Ross, 1984).

APT approach is well conditioned for legal restrictions due to the flexible nature of the approach to adapt to special situations. The fund managers are able to make desirable investment choices which have varying levels of exposure to economic risks. This theory is vital to the research under study in explaining the returns in pension funds given that asset classes are exposed to both systematic and unsystematic risk. Implementing it either involves selecting fund managers according to their exposure to economic risks or depending on diversification in removing idiosyncratic risks.

## 2.3 Determinants of Financial Performance of Pension Funds

Pension plans can either be classified as either defined benefit (DB) or defined contribution (DC) pension plans. The benefits in a DB plan are determined by the wages/salaries earned by the retiree, the number of years in employment as well as any voluntary contribution during the years of service. On the other hand, the claims in a DC plan are a factor of the returns earned on the portfolio, the fund managers therefore have to keep this in mind so that the pension plan earn returns expected by the beneficiaries. The investment strategy adopted is consequently a key determinant in meeting the objectives.

### 2.3.1 Alternative Investments

These are asset classes which are alternative to both equities and treasury bonds and they tend to have the following characteristics; retain the value of pension plan assets, they carry a claim on future cash flows, improve the returns of a portfolio and are mostly cost effective. They improve the asset mix and the fund managers will put into consideration the states of the assets, physical and financial, liquidity and underlying cash flows (UBS, 2016).

### 2.3.2 Government Securities

The RBA limit for investment in Government Securities is 90% of the Fund. It is a more appropriate investment for diversification, helps build the benchmark yield curve and also allows for more corporate debt investment (Stewart, 2015). Bonds guarantee long-term returns, they provide liquidity due to the half yearly coupon payments, and they are not subject to withholding tax and are also free from default risks. They can therefore be traded to provide liquidity to meet arising pension expenses or to take up any capital gains where the yield permits. With optimized trading, they have overtime led to better financial performance of pension funds.

### 2.3.3 Quoted Equity Investments

Equities match the attributes of long-term inflation which is linked to liabilities. It is an accepted attribute therefore, that investing in equities should take a natural position. In as much as this is the case, it is advisable to diversify a proportion of the assets because the short-term returns from the equities are very volatile (Scott, 1991). The standard practice would be to invest heavily in high yielding but riskier equities

because the expected average returns reduce future tax burdens and also help to reduce under-funding over time. A more conservative approach will seek to reduce the volatility of levels of funding and the severe economic downturn during resource constraint (Bader & Gold, 2007).

### 2.3.4 Corporate Debt (Bonds)

A corporate bond is the debt security issued by companies to investors. The RBA limit for investing pension funds in this asset category is 30%. While they offer enhanced yields to the funds, they lead to increased risk levels. This is due to rising corporate defaults and consequently short-term interruptions to income (Dawes, 2016).

### 2.3.5 Scheme Operating Costs

This constitutes Administration, investment and custody expenses. This costs are inclusive of record keeping of accounts, asset investments and also marketing expenses. The fees can either be fixed or variable. The variable fees can take the percentage of the cash inflows, amount of assets under management or a proportion of the returns on investment. They are influenced by scale. Smaller funds incur costs that are ten times higher than larger funds. Thus implying, consolidation of these smaller schemes could result to efficiency gains (Bikker & Dreu, 2007).

### 2.3.6 Density of Contributions and Retirement Age

According to Heinz et al (2010), members of a pension scheme who make low contributions will eventually on retirement have accumulated less assets and are

therefore likely to have low incomes at retirement. To lower the chances for accumulating low incomes, governments in some countries have fixed the ages of retirement and also introduced incentives to postpone retirement on the part of the members. This will result to fewer withdrawals from the pension scheme and consequently improve the circulation of money in the scheme leading to better and improved returns to the scheme.

## 2.4 Empirical Review

Studies have been done both internationally and locally on factors that affect the financial performance of pension schemes and constitute the following:

Omonyo (2003) did a survey of the investment practices of pension fund managers in Kenya. The research methodology employed was survey/explanatory research. It involved collection of Primary data where questionnaires were used and interspersed with focused interviews to the respective fund managers who provided the answers. The questions were open ended and the source of secondary data was the RBA website. From the findings, pension fund managers use a blend of passive and active styles in portfolio management. The study was in support of the findings of Aaron (2002) that risk-return considerations influence the investment strategy. The results did not reveal tactical asset allocation while the most predominant objective was capital preservation that is, striking a balance between risk and returns. Data was however not obtained from a few fund managers and the results therefore could not be generalized to these firms. Additionally, the available data covered a short period of time which limited more insight in the subject under study. The survey did not answer

the question of alternative strategies employed on asset allocation seeing that the focus was entirely on the behavior of the fund managers.

Antolin (2008) carried out a research on pension fund performance of Insurance and Private Pensions across OECD, Latin American and Central and Eastern European countries. Data on the investment performance was collected across these countries. The information was mainly collected from the regulators as well as pension fund associations on membership, assets under management, portfolio composition, the return on investment and commissions and fees charged. The research involved the use of the Sharpe ratio and attribution analysis which showed that privately managed pension funds have since been able to obtain a risk premium against short-term investment alternatives. The analysis further suggested that several countries investment restrictions had a negative impact on the financial performance of the Funds. The focus of the research was on collection and analysis of data to assess the financial performance of privately managed pension funds on a risk adjusted basis using Sharpe ratios. The results and conclusions therefore can only be used to project pension funds that are privately managed. The research does not also highlight any contributions of alternative assets and strategies to the financial performance of the privately managed pension funds.

Hlavac (2011) did a study on the performance of Czech private pension scheme with respect to the design. This thesis focused on the comparison of the Czech voluntary private pension scheme with other private schemes of Central Eastern Europe, which are Bulgaria, Croatia, Hungary, Poland and Slovak Republic. The study utilized secondary data from the Global Financial Database, annual reports of the Association of Pension Funds of the Czech Republic (1996-2009) and annual reports of the Czech

pension funds (2000-2010). The returns to various periods were collected through the interaction with the pension fund associations of these countries or from active market participants. The findings suggested that most of the observed schemes performed better than the set local short-term and short-term foreign risk-free reference benchmarks. However, underperformance was a characteristic when measured against the long-term local and long-term foreign benchmarks. The Sharpe ratio analysis suggested that with market timing and/or selection, the Fund managers were able to deliver returns as compared to the estimated passive investment benchmarks. In addition, underperformance of the pension funds was attributed to presence of legislative arrangements which required non-negative returns to be delivered every financial year which resulted to very conservative asset allocations. Hlavac's research relied data that enumerated the financial performance of private pension schemes and did not outline any effects of alternative investments or strategies on this privately managed pension schemes.

Ngetich (2012) did a survey on the determinants of the growth of individual pension schemes in Kenya. Primary data was collected from respondents using a semi-structured questionnaire as a method of data collection. The target population comprised 22 individual pension schemes in Kenya and generalizations and conclusions were made based on the findings on Individual Retirement Schemes. The data was analyzed and discovered that the performance is not sustainable due to the inflation, global financial and economic crisis and inadequate regulation and investment guidelines. He further concluded that regulation on quantitative limits in the different asset classes reduces the set of investment policies which have an effect on the return on investments. While the research was able to point out the factors of growth for individual pension scheme, the impact of allocation of assets on the growth

was not quantified. Thus, the research cannot be used as a decision making tool in allocation of alternative investments to foster growth of individual pension funds.

Kiplagat (2014) analyzed the relationship between asset allocation and financial performance. Descriptive survey was used and the population of study comprised 1,232 occupational pension schemes as at May 2014. Secondary data was collected and comprised returns and asset allocation obtained from RBA. From his findings, there is a linear correlation between the performance of the fund and the weights of the different asset classes. The strongest correlation was between fund performance and the weight of cash deposits, quoted shares, government securities and property. Further, his findings indicated that approximately 58% of the fund returns was explained by the investment policy, while the remaining 42% was by other factors such as assets selection, timing and manger selection. The research satisfactorily provided quantitative results for each asset class but did not explain the relationship between alternative asset classes and financial performance. While it did explain that 42% of the returns were explained by asset selection amongst other factors, no clear findings expressly state the effect of alternative investments on financial performance.

Njeru (2014) investigated the relationship between portfolio holdings and financial performance of pension funds. The study also examined how the funds are invested in the different asset classes. It was a survey of the entire pension industry and used secondary data which was obtained from Scheme Administrators. A mail questionnaire was also used as part of data collection. From the findings, it was discovered that equities performed better in large pension funds compared to medium or small funds than all other assets under study. The investments done offshore were the least for all funds but more so in the medium pension funds. The disclaimer was

that if the Fund managers were to go ahead with the offshore investment it should only be for one year period. He further found out that discretionary and non discretionary investment mandates to the fund managers affect the performance of the pension funds. The overall conclusion was that pension funds should consider the asset mix in the portfolio to improve on the efficiency and ultimately the objective of income replacement in retirement. While he pointed out that Equity holdings had the highest contribution to returns the findings do not provide a guide on how allocation of other assets should be done to improve this efficiency. The focus was on Equity and Offshore investments in the conclusion and did not consider any form of alternative asset classes.

Rotich (2016) in his research on impact of real estate on performance of the pension funds employed descriptive survey of the pension funds registered by the Retirement Benefits Authority. Secondary data was utilized which dated back to a period of 5 years and a census of pension funds which invested in real estate, totaling to forty eight was adopted. He concluded that real estate is a significant investment which strongly affects the returns on investments. This was through a correlation analysis which yielded a strong correlation coefficient as well as from the multiple and linear regressions. The correlation factor was 0.833. While the research revealed a strong correlation, the researcher did not evaluate the implication of real estate expenses on the net return of the pension funds. A strong relationship does not necessary imply guaranteed long-term returns, it could be likely that this returns are not sustainable.

## 2.5 Conceptual Framework

This is the written or visual presentation that narratively or graphically explains the main concepts in a study as well as the presumed relationship among them (Miles & Huberman, 1994). In this study, the conceptual framework looked at the effect of alternative investments on the financial performance of pension funds in Kenya. The alternative investments were the independent variable while the dependent variable was the financial performance. Where alternative assets were private equity, REITs, private bonds and commercial papers and immovable property. Other control variables which had an effect on the financial performance of the pension plans included Cash and Fixed Deposits, Government securities, quoted equity and offshore investments. This is as per the diagram below:

**Figure 2.1: Conceptual Model**

<u>**Independent Variables**</u>　　　　　　　　　　　　<u>**Dependent variable**</u>

- Alternative Investments

  (Allocation (%))

    - Private Equity &
      Venture Capital

    - REITs

    - Real Estate

    - Private Bonds

- Cash and Fixed
  Deposits

  (Allocation (%))

- Government Securities

  (Allocation (%))

- Quoted Equity

  (Allocation (%))

- Offshore Investments

  (Allocation (%))

Financial Performance

(Return on Investments)
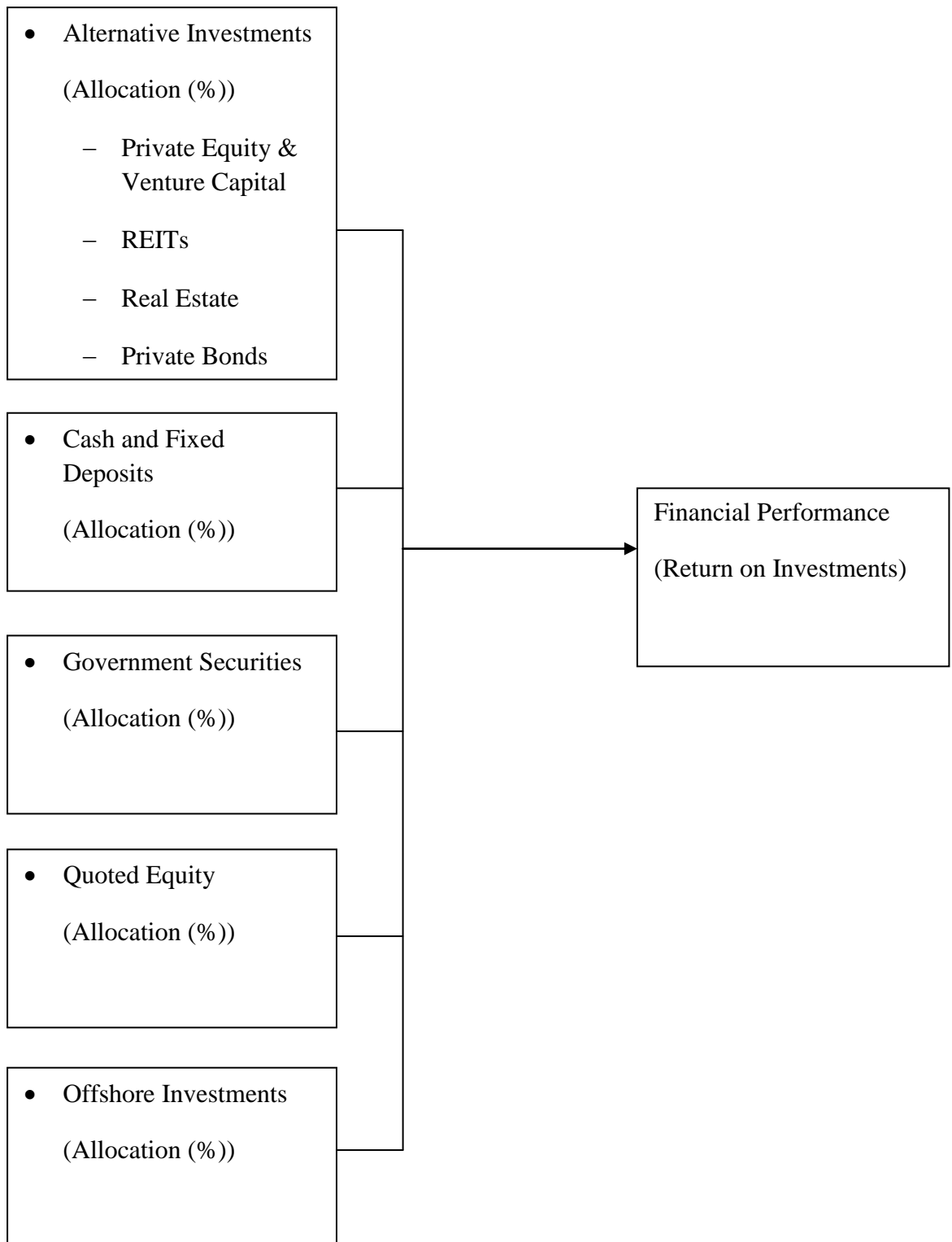
**Source: Researcher**

## 2.6: Summary of Literature Review

The studies done have focused on effects that asset allocation has on performance of the fund, real estate or immovable property investments as well as investment practices by the various fund managers. The studies have a bias on traditional asset classes and therefore a gap exists, where studies have not focused on alternative investments as a key contributory factor of performance of pension funds. It is for this need that the researcher seeks to research on the effect of alternative investments on the financial performance of pension funds in Kenya.

**Table 2.1: Summary of Literature Review**

| Author of study | Focus of Study | Methodology | Findings | Knowledge Gaps |
|---|---|---|---|---|
| Omonyo (2003) | Investment practices of pension fund managers in Kenya. | Survey | Use of passive and active styles in portfolio management. | Use of alternative investment strategies |
| Antolin (2008) | Pension fund performance of Insurance and private Pensions. | Descriptive research | Investment restrictions have a negative impact on the financial performance. | Effect of alternative investments on Performance of private pension schemes |
| Hlavac (2011) | Performance of private pension schemes. | Descriptive research | Schemes performed better that the set local benchmarks. | Effect of alternative investments on Performance of private pension schemes. |

| | | | | |
|---|---|---|---|---|
| Ngetich (2012) | Determinants of the growth of individual pension schemes in Kenya. | Survey | Performance is not sustainable due to inadequate regulation and investment guidelines. | Alternative investments as a factor of growth |
| Kiplagat (2014) | Relationship between asset allocation and financial performance. | Descriptive survey | Linear correlation between the performance of the fund and the weights of the different asset classes. | Relationship between alternative investments and financial performance |
| Njeru (2014) | Relationship between portfolio holdings and financial performance of pension funds. | Survey | Discretionary and non discretionary investment mandates affect performance of the pension funds. | Relationship between alternative investment holdings and financial performance |
| Rotich (2016) | Impact of real estate on performance of pension funds. | Descriptive survey | That real estate is a significant investment which strongly affects the returns on investments. | Impact of other forms of alternative investments on performance of pension funds. |

**Source: Researcher**

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter provides the research methodology which is inclusive of the research design chosen, the population's size as well as sampling frame and the sample design. It also encompasses the methods of data collection and its analysis procedures. Kothari (2014) defines research methodology as a systematic, theoretical analysis of the procedures applied to a field of study.

## 3.2 Research Design

Kothari (2004) defines a research design as the heart of any study. It is a plan or roadmap or blueprint investigation strategy used in obtaining answers to the research questions. This research will involve descriptive research. Aggarwal (2008) describes descriptive research as a process devoted to information gathering on prevailing conditions for the purpose of description and interpretation. It is not just accumulating and tabulation of facts but is inclusive of proper analyses, interpretation, comparisons, identification of trends and relationships. This research design will seek to analyse and interpret the effect of use of alternative investments on the performance of pension funds in Kenya.

## 3.3 Population

Best (2007) defines a population as any group of individuals who have one or more common characteristics of interest to the researcher. The population of interest to the

researcher was 1,218 pension schemes in Kenya reported as at 31$^{st}$ December 2015, this constituted 442 segregated and 776 guaranteed schemes.

## 3.4 Sample

A sample is defined as a subset of a population which is representative of the entire group. The focus of study was the segregated schemes which were 442 pension schemes as at 31$^{st}$ December, 2015. A guaranteed pension plan is a scheme whose security is a policy issued by an insurance company registered with RBA and guarantees the members a minimum return every financial year. On the other hand, in a segregated plan, assets are held in trust with no minimum interest guarantee. The Fund value fluctuates with market prices. With segregated pension schemes, it is easier to monitor the asset allocation done by fund managers unlike in a guaranteed set up where the investment involves a pooled fund. The schemes were stratified based on fund values as at 31$^{st}$ December, 2016. The sampling technique was therefore stratified sampling technique. The sample size constituted 90 pensions schemes which invested in the alternative assets under study.

## 3.5 Data Collection

Secondary data was collected for the research and was obtained from the Retirement Benefits Authority in Kenya. All registered pension schemes file their returns with RBA at the end of every financial year, the fund managers also file quarterly returns and therefore provided comprehensive data for the study. The data collected include d the fund values, total scheme assets, asset allocation and the investment return for

every scheme. To ensure enough representation, secondary data covered a period of 5 years, which is 2012-2016.

## 3.6 Diagnostic Tests

For there to be legitimacy and validity of information, the information gathering methods must be able to yield data that is both applicable and correct. There must exist resolute quality which is often portrayed as how a review, test or estimation is comparable to the results on reiterated trials. Legitimacy is also a way of surmising. It measures how much results gathered speak to the wonder in the study. The researcher utilized substance legitimacy which is a measure of how much information utilizing a specific instrument speaks to a particular area of pointers or substance of a specific idea. Diagnostic tests used were test for multicollinearity and test for autocorrelation.

## 3.7 Data Analysis

Mugenda and Mugenda (2003) defines data analysis as the process of bringing order, structure and meaning to the collected data or information. The data collected from RBA included the fund values, allocations of assets in the selected pension schemes as well as the returns in the periods under study. This data was used to develop a multiple regression model for data analysis.

## 3.7.1 Analytical Model

This study employed the use of a linear multiple regression model to analyze the effect of alternative investments on the financial performance of pension funds in Kenya. The term multiple regression was first used by Pearson (1908), whose purpose

is to explain the relationship between a dependent variable and several predictor or independent variables. A comparison was done between the percentage or ratio of the various asset holdings and the return on investment for each of the segregated pension schemes selected. The independent variable for every pension scheme was measured by adding up the returns from the independent variables. A similar model was used by Muia (2015) to establish the relationship between asset allocation and financial performance of pension funds in Kenya.

The model appeared as below:

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

Where:

Y was the Financial Performance as measured by the risk − adjusted return on investment (RoI) as per the Sharpe Ratio,

Where;

$$\text{Risk adjusted RoI} = \frac{\text{RoI} - \text{Risk Free Rate of Interest}}{\text{Portfolio Standard deviation}}$$

$$\text{RoI} = \frac{(\text{Current Fund Value - Previous Fund Value})}{\text{Previous Fund Value}} * 100$$

α was the constant

β was the regression coefficient

$X_1$ was the weight of private equity & venture capital = (Total private equity and venture capital/Total asset value of the pension fund)

$X_2$ was the weight of REITs = (Total REITs/Total asset value of the pension fund)

$X_3$ was the weight of real estate = (Total value of immovable assets/Total asset value of the pension fund)

$X_4$ was the weight of private bonds = (Total value of private bonds/Total asset value of the pension fund)

$X_5$ was the weight of cash and fixed deposits in the fund = (Total value of cash and fixed deposits/Total asset value of the pension fund)

$X_6$ was the weight of fixed income and government securities in the fund = (Total value of fixed income and Government securities/Total asset value of the pension fund)

$X_7$ was the weight of quoted equity in the fund = (Total value of quoted equity/Total asset value of the pension fund)

$X_8$ was the weight of offshore investments in the fund = (Total value of offshore investments/Total asset value of the pension fund)

ε was the error term

## 3.7.2 Inferential Statistics

The tests of significance that were used in the study included the t-test which tested at 95% level of confidence the statistical significance of the constant terms; $\alpha$ and $\beta$. The F-statistic was also used to test for the statistical significance of the regression model at 95% level of confidence. Further, the R-square and Adjusted R-square were used to test for how much of the variations in the dependent variable were explained by the variations in the independent variables.

# CHAPTER FOUR

# DATA ANALYSIS AND PRESENTATION OF FINDINGS

## 4.1 Introduction

This chapter presents the analysis and findings of the research objective, which is the determination of the effect of alternative investments on the financial performance of pension funds in Kenya. The population as at $31^{st}$ December, 2016 was 442 segregated pension schemes but only data from 385 schemes was available. The remaining 57 schemes did not qualify for sampling due to incomplete data, data received did not pass sense checks and also responses to queries were not received on time. The data was obtained from the Retirement Benefit Authority and the Actuaries Survey from Alexander Forbes Consulting. This chapter illustrates the extent to which each form of alternative assets contributes to the financial performance of a pension scheme. The sample size was computed using the below formula:

$n_{1=}$ n.Pi where Pi= $N_1$ /N

Where:

N – Population size

$N_1$ – Stratum size

n – Total sample size

 Pi - Proportion of population included in stratum

i – Stratum

$n_1$ – No. of elements selected in a stratum

**Table 4.1: Pension Funds Sample Size**

| Fund Value (Ksh Million) | Observation | No. of Pension Funds in Strata | No. of Pension Funds in Sample |
|---|---|---|---|
| Less than 250 | 385 | 138 | 90/385*138=32 |
| 250-1,000 | 385 | 124 | 90/385*124=29 |
| Over 1,000 | 385 | 123 | 90/385*123=29 |
| **Total** | **385** | **385** | **90** |

Source: Research Findings (2017)

**Table 4.2: Size Categorization of Participating Schemes**

| Size of the Pension Scheme | Market Value (Kshs. Millions) | Number of Pension Funds | Pension Fund Percentage (%) | Asset Percentage (%) | AUM in (Kshs. Millions) |
|---|---|---|---|---|---|
| **Small** | Less than 250 | 138 | 35.9% | 2.5% | 15,142 |
| **Medium** | 250 to 1,000 | 124 | 32.3% | 10.8% | 64,181 |
| **Large** | Over 1,000 | 123 | 31.8% | 86.7% | 517,196 |
| **Total** | | **385** | **100.0%** | **100.0%** | **596,519** |

Source: Research Findings (2017)

## 4.2 Descriptive Statistics

The descriptive statistics considered were minimum, maximum, standard deviation, mean, skewness and kurtosis. 90 Pension funds were used in the analysis over a five year period, 2012-2016.

**Table 4.3: Analysis and Distribution of Returns for all Pension Funds for the Period Ending 31 December 2016**

|  | 1 Year (%) | 3 Year (%) |
|---|---|---|
| **Average** | 8% | 8.3% |
| **Weighted Average** | 6.3% | 7.3% |
| **Range of Returns** | 20.4% | 11.0% |
| **25th Percentile** | 6.5% | 7.6% |
| **Median** | 8.2% | 8.4% |
| **75th Percentile** | 9.4% | 9.0% |

**Source: Research Findings (2017)**

**Table 4.4: Analysis of Asset Allocation for the Period Ending 31 December 2016**

|  | Equity | Fixed Income | Property | Offshore |
|---|---|---|---|---|
| **Average** | 19.6% | 74.9% | 4.5% | 1.0% |
| **Weighted Average** | 23.5% | 65.2% | 10.3% | 1.0% |
| **Range of Allocation** | 50.2% | 88.4% | 88.4% | 16.7% |

| | 16.6% | 70.9% | 0.0% | 0.0% |
|---|---|---|---|---|
| **25th Percentile** | 16.6% | 70.9% | 0.0% | 0.0% |
| **Median** | 20.2% | 77.4% | 0.0% | 0.0% |
| **75th Percentile** | 23.9% | 82.3% | 0.0% | 0.0% |

**Source: Research Findings (2017)**

**Table 4.5: Descriptive Statistics and Distribution of Variables**

| | N | Min | Max | Mean | Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| | | Stat. | Stat. | Stat. | Stat. | Stat. | Stat. |
| **FV** | 385 | 131,417 | 28,004,177,000 | 1,340,937,356 | 3,356,825,571 | 4.95 | 29.75 |
| $X_1$ | 385 | 0 | 166,654,657 | 2,236,062 | 15,024,775 | 8.65 | 80.27 |
| $X_2$ | 385 | 0 | 2,725,000,000 | 34,025,658 | 256,343,288 | 9.78 | 98.23 |
| $X_3$ | 385 | 0 | 5,853,274,000 | 332,446,678 | 957,480,176 | 3.67 | 14.24 |
| $X_4$ | 385 | 0 | 1,927,917,000 | 108,620,936 | 264,480,283 | 4.44 | 22.20 |
| $X_5$ | 385 | 0 | 1,731,759,000 | 51,863,375 | 136,118,156 | 6.17 | 58.00 |
| $X_6$ | 385 | 0 | 9,743,212,000 | 506,647,097 | 1,219,476,055 | 4.40 | 22.31 |
| $X_7$ | 385 | 0 | 9,864,976,000 | 369,802,033 | 1,109,738,994 | 5.87 | 39.88 |
| $X_8$ | 385 | 0 | 2,435,849,000 | 48,715,139 | 242,325,828 | 7.83 | 65.49 |

**Source: Research Findings (2017)**

From the table above the largest pension scheme had a fund value of Ksh. 28 billion, with the lowest having a value of Kshs. 131,417. This was attributed to the period the schemes had been in existence. Pension funds that have been in existence for more than 5 years are found to have a bigger fund due to accumulation of contributions and

accrued interest. The largest allocation of assets was in Quoted Equity, Kshs. 9.8 billion followed closely by fixed incomes and government securities of Kshs. 9.7 billion. It was therefore consistent with other studies that have been done by Mugambi (2014) and Muia (2015) where the largest allocation was discovered to be in Government Securities. Further, it was discovered that there were several schemes which had not invested in all asset classes but had limited allocation to one or two classes. This was especially where the pension schemes had a small fund value and had only invested in cash and fixed deposits. Private equity and venture capital had the least allocation of Kshs. 166 million with a standard deviation of Kshs. 15 million. The low allocation to this class of assets was attributed to the risky nature of the asset and uncertainty in returns seeing that it was a new asset class.

All asset classes had a high standard deviation which meant that the weights of the asset classes were not close to the mean but were widely dispersed over a range of values. Among all assets, quoted equities had the highest standard deviation of Kshs. 1.1 billion with the lowest deviation seen in private equity and venture capital of Kshs. 15 million.

From the table above, all asset classes displayed positive values of the skew; the tail was longer to the right meaning that the data was asymmetrical. This was an implication that the analyzed data had a skewed right or positively skewed distribution. Further, all variables had a skew which was greater than zero which was a reflection of asymmetry and distribution of data further away from normal. This was mainly attributed to the diversity in the returns of the different asset classes and the tendency of fund managers to invest in government securities and quoted equity with little allocation in cash and fixed deposits for liquidity purposes. Additionally, the

data analyzed revealed a kurtosis of greater than 3 for the fund value and all the asset classes. The kurtosis of normally distributed data is approximately 3 (excess ≈ 0) and this was therefore used as the point of reference.  From the analysis therefore, it was noted that the data portrayed leptokurtic distribution because the kurtosis was greater than 3 for all variables. The tails were longer and fatter with a sharp and high peak.

## 4.3 Diagnostic Tests

Diagnostic tests carried out were tests for normality, multicollinearity and autocorrelation and are provided below. They were used to test for data fitness before any further analysis.

### 4.3.1 Test for Normality

A normality test was done to determine the distribution of the dependent and independent variables. Variables included were the weights of the alternative asset classes as well as the control variables. The study sought to determine whether the secondary data collected was normally distributed using a histogram. A histogram is a graphical representation that shows the frequency of data of equal size that occurs in successive numeric intervals.

The return on investments was plotted against the weights of the asset classes as can be seen below. The dependent variable (Y) represents the return on investments of the particular pension schemes, the independent variables were the weights of private equity and venture capital, REITs, immovable property, private bonds, cash and fixed deposits, fixed income and government securities, quoted equity and offshore investments.

The two halves of the histogram were mirror images of each other and thus the distribution was symmetric implying that the data was normally distributed. Below is the output of the histogram under regression analysis:

**Graph 1: Normality Test**
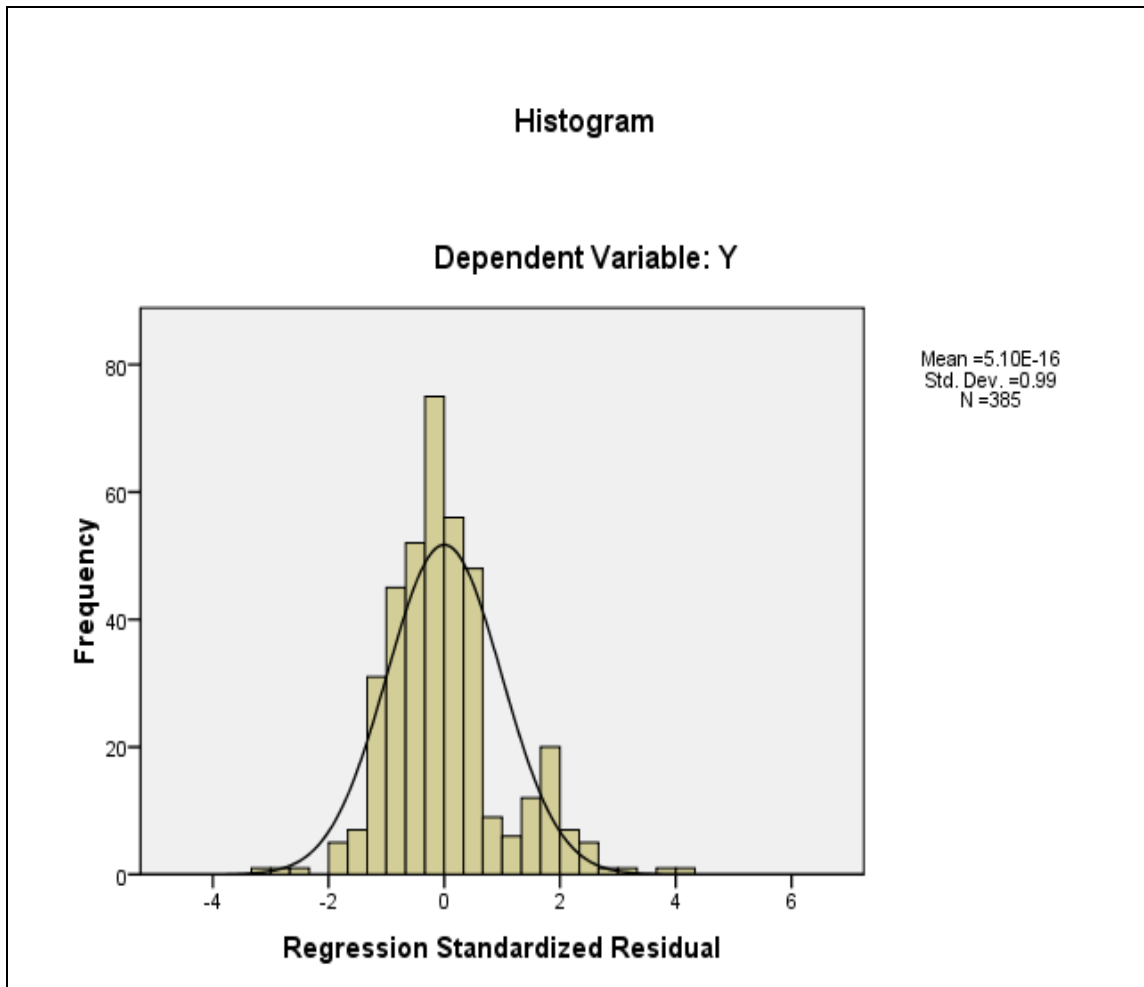
## 4.3.2 Test for Multicollinearity

Multicollinearity was used to test for similarity between the independent variables. If the VIF value is between 1 and 10, then there is no multicollinearity. For all variables

analyzed the VIF was less than 10 and therefore a conclusion of multicollinearity was made. The collinearity statistics are represented below:

**Table 4.6: Multicollinearity Test**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| | (Constant) | .141 | .024 | | 5.919 | .000 | | |
| | $X_1$ | -.111 | .148 | -.037 | -.751 | .453 | .984 | 1.017 |
| | $X_2$ | .128 | .131 | .048 | .975 | .330 | .980 | 1.020 |
| | $X_3$ | .143 | .110 | .064 | 1.304 | .193 | .981 | 1.019 |
| 1 | $X_4$ | .653 | .331 | .123 | 1.973 | .049 | .613 | 1.632 |
| | $X_5$ | .197 | .106 | .092 | 1.859 | .064 | .969 | 1.032 |
| | $X_6$ | -.015 | .071 | -.014 | -.215 | .829 | .554 | 1.806 |
| | $X_7$ | .070 | .124 | .039 | .568 | .570 | .503 | 1.987 |
| | $X_8$ | 2.515 | .632 | .221 | 3.978 | .000 | .771 | 1.298 |

**Source: Research Findings (2017)**

**4.3.3 Test for Autocorrelation**

The Durbin-Watson was used to test for auto-correlation. From the analyzed data, d = 1.912 which was between the 2 critical values $1.5 < d > 2.5$. It was therefore confirmed that there was no first-order linear auto-correlation in the multiple linear regression model.

**Table 4.7: Autocorrelation Test**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .326[a] | .106 | .087 | .2637573 | 1.912 |

a. Predictors: (Constant), $X_8$, $X_3$, $X_2$, $X_1$, $X_5$, $X_4$, $X_6$, $X_7$

b. Dependent Variable: Y

**Source: Research Findings (2017)**

## 4.4 Correlation Analysis

Correlation is used to investigate the relationship between two quantitative and continuous variables. Correlation between the dependent variable (return on investments) and the independent variables (weights of alternative assets, weight of cash and fixed deposits, weight of fixed income and government securities, weight of quoted equity and weight of offshore investments) was determined. Pearson's correlation coefficient (r) was used as it measures the strength of the association between variables. This was based on the following data assumptions: the variables were linearly related and they were bivariate normally distributed. The closer 'r' is to ±1, the stronger the relationship.

Given the data under study, the research findings established weak correlation between the return on investments and the weights of the asset classes. All variables except private equity and venture capital exhibited a positive weak correlation of 0.014, 0.064, 0.195, 0.115, 0.16, 0.21 and 0.264 for the weights of REITs, immovable property, private bonds, cash and fixed deposits, fixed income and government securities, quoted equity and offshore investments respectively. This is to say, as weights of this asset classes increase, the return on investment also increases i.e they move in the same direction. Additionally, all values were closest to zero than 1 exhibiting weak correlation except quoted equity and offshore investments which indicated moderate correlation of 0.210 and 0.264 respectively. The correlation in equity was consistent with a study done by Rotich (2016). The weight of private

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equity and venture capital had a weak correlation of -0.069. This implied that as units of private equity and venture capital are increased, the return on investment reduces i.e they move in opposite directions, and that this relationship was weak because it was closer to zero than 1. All correlation coefficients were statistically significant at a level of 5% and 10% except for 3 variables, weights of private equity and venture capital, REITs and Immovable property.

Cash and Fixed deposits are held for liquidity, to meet the daily pension funds expenses such as custody fees, administration fees, management fees, withdrawal benefits, pension benefits (payroll) and trustee allowances. This therefore explains the weak positive correlation of 0.115 between this asset class and return on investments.

**Table 4.8: Correlation Coefficients**

| | Y | $X_1$ | $X_2$ | $X_3$ | $X_4$ | $X_5$ | $X_6$ | $X_7$ | $X_8$ |
|---|---|---|---|---|---|---|---|---|---|
| **Y** | 1 | | | | | | | | |
| $X_1$ | -.069 | 1 | | | | | | | |
| $X_2$ | .014 | -.014 | 1 | | | | | | |
| $X_3$ | .064 | -.044 | -.031 | 1 | | | | | |
| $X_4$ | .195** | -.058 | -.075 | .045 | 1 | | | | |
| $X_5$ | .115* | -.044 | -.056 | -.072 | .125* | 1 | | | |
| $X_6$ | .160** | -.080 | -.114* | -.009 | .561** | .133** | 1 | | |
| $X_7$ | .210** | -.109* | -.112* | .065 | .537** | .078 | .592** | 1 | |
| $X_8$ | .264** | -.066 | -.070 | -.010 | .209** | .053 | .329** | .466** | 1 |

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

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

## 4.5 Regression Analysis

This is a predictive technique used to determine the relationship between variables and their importance in the model. To establish the relationship between alternative investments and financial performance, multiple regression analysis was done using the statistical package of social science (SPSS). This section therefore gives a detailed analysis of the research findings of this relationship.

### 4.5.1 Model Summary

The findings are presented below:

**Table 4.9: Regression Model**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|----------------------------|
| 1 | .326[a] | .106 | .087 | .2637573 |

a. Predictors: (Constant), $X_8$, $X_3$, $X_2$, $X_1$, $X_5$, $X_4$, $X_6$, and $X_7$

R-square is used to determine how much of the variations in the return on investments are explained by the model. The R-Square from the output was 0.106 and consequently it can be noted that 10.6% of the variations in the returns on investments were explained by the respective weights of private equity and venture capital, REITs,

immovable property, private bonds, cash and fixed deposits, government securities, quoted equity and offshore investments. The remaining 89.4% was a result of unexplained factors.

### 4.5.2 Analysis of Variance

The researcher also conducted a hypothesis test between the variables. A null hypothesis was assumed, there is no relationship between alternative investments and financial performance. The findings are as shown below:

**Table 5.0: Analysis of Variance (ANOVA)**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Regression | 3.102 | 8 | .388 | 5.573 | .000[a] |
| 1 | Residual | 26.158 | 376 | .070 | | |
| | Total | 29.259 | 384 | | | |

a. Predictors: (Constant), $X_8$, $X_3$, $X_2$, $X_1$, $X_5$, $X_4$, $X_6$, and X7

b. Dependent Variable: Y

Drawing from the findings of the table above, the F statistic was established as significant at a level of 0.0001%. The data therefore was ideal for making conclusions on the population given that the value of significance was less than 5%. The overall model was therefore significant and the null hypothesis, there is no relationship

between return on investments and weights of the different asset classes, was rejected. The results can therefore not be attributed to chance.

**Table 5.1: Regression Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .141 | .024 | | 5.919 | .000 |
| | $X_1$ | -.111 | .148 | -.037 | -.751 | .453 |
| | $X_2$ | .128 | .131 | .048 | .975 | .330 |
| | $X_3$ | .143 | .110 | .064 | 1.304 | .193 |
| | $X_4$ | .653 | .331 | .123 | 1.973 | .049 |
| | $X_5$ | .197 | .106 | .092 | 1.859 | .064 |
| | $X_6$ | -.015 | .071 | -.014 | -.215 | .829 |
| | $X_7$ | .070 | .124 | .039 | .568 | .570 |
| | $X_8$ | 2.515 | .632 | .221 | 3.978 | .000 |

a. Dependent Variable: Y

$$Y = 0.141 - 0.111X_1 + 0.128X_2 + 0.143X_3 + 0.653X_4 + 0.197X_5 - 0.015X_6 + 0.070X_7 + 2.515X_8$$

From the above linear regression model, it was noted that offshore investments had the largest contribution to the return on investments. Holding all other factors constant, a unit increase in offshore investments will result to an increase in the returns by 2.515 units. The coefficient was significant given that the level of

significance was below 5%. This implies that variations in the weights of the offshore investments significantly affect the returns on investment. Additionally, when all the weights of the assets are held at zero, the financial performance of any pension scheme will be 0.141. It is possible for a pension scheme to generate returns when allocation in asset classes is held at zero. This is mainly due to the cash inflows in form of contributions that will increase the fund value after payment of expenses. This coefficient was statistically significant given that the level of significance was below 5%. Holding all other factors constant, a unit increase in private equity and venture capital will result to a decrease in the returns by 0.111 units. The coefficient was insignificant given that the level of significance was above 5%. Holding all other factors constant, a unit increase in REITs will result to an increase in the returns by 0.128 units. Holding all other factors constant, a unit increase in immovable property will result to an increase in the returns by 0.143 units. Holding all other factors constant, a unit increase in private bonds will result to an increase in the returns by 0.653 units. Holding all other factors constant, a unit increase in cash and fixed deposits will result to an increase in the returns by 0.197 units. Holding all other factors constant, a unit increase in fixed income and government securities will result to a decrease in the returns by 0.015 units. Lastly, holding all other factors constant, a unit increase in quoted equity will result to an increase in the returns by 0.070 units.

The variables of interest were the alternative asset classes (private equity and venture capital, REITs, Immovable property and private bonds) which had beta coefficients of -0.111, 0.128, 0.143 and 0.653 respectively. From the levels of significance only private bonds were significant at a level of 5%, given that the coefficient exhibited a significance level of 4.9%. This implied that unit changes in the weight of the private bonds results to significant changes in the returns on investments.

## 4.6 Interpretation of Findings

The objective of the study was to determine the effect of alternative investments on the financial performance of pension schemes and this was successfully achieved. Descriptive statistics suggested that the greatest allocation of assets was directed to fixed income and government securities, quoted equity and immovable property, which had means of Kshs. 506 million, Kshs. 369 million and Kshs. 332 million respectively. Fund managers are conservative in investments in pension schemes to ensure that they keep their promise to the retirees and will often invest in less risky assets. Government securities are riskless assets as investors are almost certain that the government will always be in a position to repay money borrowed. The exposure to equities was high and this was attributed to historical positive performance.

The least mean allocation was in private equity and venture capital and REITs of Kshs. 2.2 million and Kshs. 34 million respectively. The low allocation to private equity and venture capital was attributed to the risky nature of the asset class and uncertainty in returns since it was a new asset class that was approved in 2016. On the other hand, allocation in REITs was observed in 19 out of 95 pension schemes. This particular REIT was an income real estate vehicle that was listed on the NSE in 2016 by Stanlib, Kenya. Fund managers, just like other investors, were skeptical about the investment as they sought to acquaint themselves with this new investment vehicle in the Kenyan Market. As at 10th February 2017, it ranked 32nd on the NSE in terms of returns to the investors with a year-to-date loss of 9.62%. Consequently, the new nature and negative returns explained the low allocation.

The Pearson correlation coefficients did not reveal a strong relationship between the weights of the asset classes and the return on investments. However, the weights of

fixed income and government securities and quoted equity revealed a close moderate positive relationship of 0.21 and 0.264 respectively. The weak correlation between the return on investments and the weights of the asset classes were indicative of presence of other factors that influence the returns of pension funds. This was exhibited by the unexplained variations in the regression model of 89.4%. These factors include but not limited to fund governance, fund regulations, operational efficiency, investment strategy and pension fund ethics as studied by Ng'etich (2012). From his study, these factors explained 84.3% of the variations of the growth of pension funds. This therefore means that asset allocation is not the only determinant of the returns of pension funds. Efficient asset allocation done in line with the RBA and IPS limits does not always translate to higher returns. Oluoch (2013) also discovered that the fund value, age of pensioners and rate of contributions also have an effect on the returns of pension funds.

Further tests using R-square indicated that 10.6% of the variations in the returns was a consequence of the weights of the asset classes. The analysis of variance (ANOVA) indicated that these variations were not as a result of mere chance because the level of confidence was less that 5%.

From the regression coefficients was noted that among the alternative asset classes, (private equity and venture capital, REITs, immovable property and private bonds), private bonds had the largest contribution to the return on investments followed by immovable property and REITs. However, a negative relationship was observed between return on investments and private equity and venture capital. These findings were consistent with the analysis of the correlation coefficients. Unlike previous studies done by Onyango (2011) and Njeru (2014), private bonds had a greater

contribution to the returns on investment than quoted equity by 0.583. However, the asset allocation to quoted equity was greater than allocation to the private bonds. This was attributed to rising default rate by corporate bodies as was witnessed by Imperial Bank in 2015 and Chase bank which was put under receivership.

The regression coefficient of the fixed income and government securities indicated a negative relationship between returns and the weight. In the years 2015 and 2016, there was a decline in the returns on the securities due to high liquidity in the money market and this relatively explained the relationship. From the findings, it was evident that large exposure of the pension schemes to fixed income and government securities does not always translate to higher returns in a pension scheme. It is therefore necessary that fund managers strike a balance between private bonds and government instruments to counter the decline in returns.

Additionally, the higher regression coefficient in the private bonds was a consequence of poor performance in the bourse, capping of the interest rates by Central Bank and also volatility in the market as was observed in the year 2012, 2013 and 2015 which contributed to the poor performance in the listed equities. Private bonds were statistically significant at a level of 5%. This implied that private bonds have a significant relationship with the returns on investments. The exposure to this class of assets therefore, should be increased to generate more returns for the pension funds. The remaining alternative assets, immovable property was not statistically significant, given that it exhibited a level of significance that was greater than 5%. This meant that immovable property and the returns on investments did not have a significant relationship in the period under study.  The relationship however between the returns and weights of immovable property as seen in the regression coefficient was positive

(+0.143). Pension funds should turn to real estate as a diversification strategy to reduce the portfolio risk and also serve to increase the members' overall returns. They are an all-weather asset class as they provide higher yields than bonds in high growth environments. This will supplement the decline in returns of quoted equities, fixed income and government securities and any corporate default.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

The objective of the study was to determine the effect of alternative investments on the financial performance of pension funds in Kenya. Consequently, from the data collected, this chapter captures discussions on conclusions, recommendations and limitations of the study.

## 5.2 Summary of Findings

The study rejected the null hypothesis that there is no relationship between alternative investments and financial performance in Kenya and accepted the alternative hypothesis that there is indeed a relationship between alternative investments and financial performance. The findings are consistent with findings of Muia (2015), increase in weights of fixed and government securities, immovable property, quoted equities and offshore investments in bank deposits impacts on the profitability of pension schemes. The study was descriptive survey and utilized secondary data from the retirement benefits authority and actuarial surveys from Alexander Forbes, Kenya. Segregated pension schemes as at 31$^{st}$ December, 2016 were used for cluster sampling. Assets considered as alternative assets in the study were private equity and venture capital, REITs, immovable property and private bonds while the control variables were fixed income and government securities, quoted equity, cash and fixed deposits as well as offshore investments.

Taking the alternative assets into consideration, from the descriptive statistics, immovable property and private bonds had the largest allocation. Pension funds with a fund value greater than Kshs. 2 billion invested almost 50% of their funds in the real estate sector while exposure in quoted equity was below 20%. Private bonds were statistically significant in the regression analysis implying that given the risky nature of the asset, returns are considerably high and fund managers should not shy away from increasing exposure in this sector. 50% of the pension schemes that did not invest in real estate invested in REITs and this was particularly in schemes with fund values below Ksh. 1 billion. The negative returns in the private equity and venture capital sector were a disincentive for increased exposure in this asset class. However, given that the market is recovering from a bear run, private equity and venture capital is projected to perform better and generate higher returns for the pension schemes.

From the study, it suffices to say that 10.6% of the variations in the returns of the pension schemes were due to the weights of the asset classes. However, the relationship as evidenced by the correlation analysis is weak which implies that asset class allocations are not the only causative factors of financial performance in pension funds. Consequently, alternative assets except private equity and venture boost the returns of pension funds and increasing exposure in these asset classes will see assets under management grow beyond a compounded rate of 9%.

Additionally, the slow growth in the government securities was attributed to fund managers who divested the assets in corporate bonds and fixed deposits. Owing to the poor performance of the equities in 2015 and 2016, pension schemes should increase their exposure to private bonds.

Alternative investments were an option for well funded pension schemes, this is contrary to research findings by Anantharaman (2011), he asserted that they are often undertaken by moderately underfunded funds than very underfunded or very well funded pension schemes. Aubry et al (2017) had similar conclusions where large pension funds held more assets in private equity which revealed stronger returns compared to small plans. The results also revealved a statistically significant relationship between alternative investments and returns of the pension schemes.

## 5.3 Conclusions

From the study, it is concluded that alternative investments (private bonds, immovable property, REITs and Government Securities) contribute to the returns of the pension schemes. This is however not the case for private equity and venture capital. It implied that fund managers should strike a balance between these alternative asset classes and traditional asset classes to ensure that pension schemes utilize the growing assets under management as well as maximize returns for the retirees. Offshore investments were not categorized as alternative asset classes in this study but were a control variable. They were however seen to contribute greatly to the returns of the pension schemes. A unit change in the weights of the offshore investments, all factors held constant, will lead to an increase of the returns by 2.515 units. Fund managers should be encouraged to increase allocation in this asset class but at discretion to hedge against any market downturns.

Additionally, from balance of the 89.6% not accounted for in the model was due to other factors not captured in the study and this includes scheme expenses such as custody fees and administration fees, retirement age or age composition of the

schemes, rates of contributions and the portfolio management styles as is portrayed by the listed fund managers. From the findings of the study, alternative investments (private equity and venture capital, immovable property, REITs and Private bonds) were seen as a high return area and pension funds should increase exposure in this class of assets. For pension schemes looking at the long term, this will be the most adequate time to allocate more money to quoted equities.

Consequently, the fund managers and Trustees need to familiarize themselves with this alternatives not only for knowledge purposes but also to improve the quality of investment decisions made in the board meetings. During annual general meetings, where members seek clarification on investments and returns, the trustees should be ready to explain to them why they have not considered investing in these new investment vehicles. Any pension scheme that will not take up investment in this asset classes will have missed out on growth opportunities as well as failed to maximize returns to the retirees. Training in the TDPK will bridge the existing knowledge gap and they will begin to appreciate the importance and subsequent benefits of these investment vehicles.

Onyango (2011), in his study on the relationship between investment strategies and financial performance of pension funds in Kenya, discovered that investment strategies have an effect on the financial performance. He discovered that one of the pertinent concerns was imprudent investments that lead to negative returns. Fund Managers and Trustees should therefore exercise discretion in asset allocation. Improved diversification through investment in both traditional and alternative asset classes will not only lead to average performance but also minimize losses in periods

of high volatility (Asebedo & Grable, 2004). Alternative investments are sustainable in the long run. Choosing and committing to alternatives is challenging but requires patience, determination and perseverance on the part of investors to see alternative strategies reap a bounty in returns and competitiveness (Liu, 2017).

## 5.4 Recommendations

The Retirement Benefits Authority should seek to increase the caps to investment in immovable property as well as REITs. From the study, private bonds performed better than quoted equity, fund managers should therefore seek to increase allocation of the assets to maximize on returns. They should also monitor investments in immovable property in average performing schemes to ensure that the schemes are not ran down by the growing property expenses as well as institute quarterly reporting of their performance. The investment cap on Government securities should be reduced in as much as they are considered to be risk free investments. From the study, they had a negative effect on the returns of the pension schemes. This will seek to hedge the schemes against any losses that would be incurred in the event the Government is unable to pay back.

Fund managers are experts in investments while some of the Trustees in the pension schemes are illiterate when it comes to investments. RBA should intensify the trainings undertaken by the Trustees in the Trustee Development Programme Kenya (TDPK) to ensure that they have a thorough knowledge of investment tools. Where Trustees do not discharge their duties appropriately and are found to be scrupulous, they should be stripped of their responsibilities. According to Odundo (2017), poor governance in pension schemes is largely due to lack of commitment and seriousness

from fund trustees. The Trustees should be ready to attach their property where the schemes continuously offer negative returns as a result of poor management. To counter the bear run that has existed in the Kenyan market in the years 2015 and 2016, fund managers should move to real estate for stable and attractive returns.

Finally, all stakeholders should turn to alternative asset classes in search for yield. As they dip their feet into this not-traditional asset space it is also vital to put into consideration the potential risk involved. Allocation and performance in the REITs was relatively low and disappointing to the fund managers but it is expected that things will begin to look up. It is expected to grow in popularity as the long-term potential becomes apparent to the investors in Kenya. Further, the CMA should therefore encourage specialized REITs, those related to low and medium cost residential properties as they have higher returns and have a lot of demand.

## 5.5 Limitations of the Study

Time was a major constraint because approval to invest in private equity and venture capital was streamlined in 2016, thus the variables need a longer period of study to fully determine their effects on the financial performance on the pension schemes. The study did not include other alternative asset classes such as exchange traded derivatives due to its pending licensing in Kenya and subsequent listing on the bourse. The study also conversed 5 years and this may not be representative of yearly performance and especially because the years under study were characterized by volatility and market downturns.

Segregated Pension Schemes were mainly the focus of study and therefore the findings may not be representative of the whole pension industry which also

comprises of guaranteed pension funds. Guaranteed schemes are pooled funds of individual schemes. The industry also comprises of hybrid schemes and as such the findings can also not be used to make inferences about these types of pension schemes. Hybrid schemes are pension schemes which are partially segregated and partially guaranteed.

The data used was secondary data, the main source which is RBA is verifiable but the data could still be prone to errors and other misgivings. The list of schemes provided was not 100% segregated schemes and this created challenges in the analysis of the data. Further, there was missing data from several pension schemes in the sample and this also constrained analysis.

## 5.6 Suggestions for Further Study

Owing to the recent approval of investment in private equity and venture capital, detailed studies should be done inclusive of the years 2016 and 2017 to determine the sustainability of financial performance contributed by the alternative asset classes. The studies should include exchange traded derivatives which are also included as an alternative asset class in the RBA investment guidelines.

More studies should be done on other contributory factors of financial performance such as alternative strategies by fund managers as this study was limited to alternative asset classes. Researchers should also take up the study of the effects of traditional asset classes on the financial performance of the pension schemes. Consequently, this will inform fund managers on the pros and cons of this asset classes. Besides asset

allocation, studies should be done that will seek to unravel any other factors that have an effect on the financial performance of pension funds in Kenya.

Further, studies should be done on the effects of financial performance of pension schemes on a country's economic growth. It was noted that the AUM are increasing annually and this provides for the country's GDP, studies in this area will seek to curb debt issues and other macro economic problems.

Studies should also be done on effects of investment behavior of portfolio managers and trustees governance on the financial performance of pension funds. This will answer the question of whether their knowledge on alternative asset classes has an effect on their investment decisions and consequently on the financial performance of pension funds in Kenya.

According Shanara (2017), financial professionals advise investors to hold 5%-15% of assets in gold depending on the age of the pension scheme, risk tolerance as well as available cashflows. Studies should be done on pension schemes that hold gold in their portfolios to assess the impact on the financial performance. The results will inform developing countries on the most appropriate course of action in preserving the scheme's value.

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# APPENDIX I

Year: 2012

| Scheme | FundValue | ROI | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,523,203,851 | 8% | 0.04 | 0.13 | 0.00 | 0.06 | 0.07 | 0.22 | 0.16 | 0.02 |
| 2 | 20,955,394 | 8% | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 93,060,219 | 8% | 0.00 | 0.00 | 0.00 | 0.12 | 0.13 | 0.45 | 0.25 | 0.04 |
| 4 | 162,388,304 | 47% | 0.00 | 0.00 | 0.00 | 0.15 | 0.12 | 0.59 | 0.15 | 0.00 |
| 5 | 494,830,834 | 39% | 0.00 | 0.00 | 0.00 | 0.11 | 0.12 | 0.59 | 0.19 | 0.00 |
| 6 | 402,728,218 | 15% | 0.00 | 0.00 | 0.00 | 0.11 | 0.17 | 0.00 | 0.29 | 0.04 |
| 7 | 4,229,202,720 | 8% | 0.00 | 0.00 | 0.17 | 0.07 | 0.09 | 0.45 | 0.23 | 0.00 |
| 8 | 563,547,412 | 8% | 0.00 | 0.00 | 0.00 | 0.11 | 0.13 | 0.54 | 0.23 | 0.00 |
| 9 | 233,704,097 | 8% | 0.00 | 0.00 | 0.00 | 0.05 | 0.02 | 0.58 | 0.32 | 0.04 |
| 10 | 6,563,907,000 | 8% | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.48 | 0.41 | 0.00 |
| 11 | 5,383,659 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 150,302,458 | 8% | 0.00 | 0.00 | 0.00 | 0.03 | 0.06 | 0.64 | 0.18 | 0.03 |
| 13 | 271,457,583 | 8% | 0.00 | 0.00 | 0.00 | 0.01 | 0.23 | 0.47 | 0.14 | 0.00 |
| 14 | 735,157,156 | 8% | 0.00 | 0.00 | 0.00 | 0.10 | 0.05 | 0.47 | 0.38 | 0.00 |
| 16 | 146,698,126 | 15% | 0.00 | 0.00 | 0.00 | 0.05 | 0.06 | 0.59 | 0.30 | 0.00 |
| 17 | 104,225,955 | 8% | 0.00 | 0.00 | 0.00 | 0.15 | 0.25 | 0.00 | 0.00 | 0.00 |
| 18 | 129,473,001 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 19 | 242,308,247 | 8% | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.62 | 0.27 | 0.04 |
| 20 | 19,761,374 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.61 | 0.35 | 0.00 |
| 21 | 452,028,507 | 8% | 0.00 | 0.00 | 0.42 | 0.07 | 0.09 | 0.17 | 0.22 | 0.01 |
| 23 | 1,289,545,752 | 6% | 0.00 | 0.00 | 0.00 | 0.11 | 0.07 | 0.63 | 0.18 | 0.01 |
| 24 | 34,235,632 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25 | 1,550,073 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 26 | 749,913,964 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27 | 1,157,787,402 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 74,965,494 | 8% | 0.00 | 0.00 | 0.00 | 0.16 | 0.07 | 0.54 | 0.19 | 0.03 |
| 29 | 42,797,493 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.69 | 0.21 | 0.00 |
| 30 | 151,741,638 | 26% | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 | 0.46 | 0.06 | 0.00 |
| 32 | 3,577,194,668 | 41% | 0.00 | 0.00 | 0.00 | 0.09 | 0.07 | 0.71 | 0.12 | 0.00 |
| 33 | 94,373,313 | 49% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 395,872,494 | 8% | 0.00 | 0.00 | 0.00 | 0.08 | 0.08 | 0.60 | 0.24 | 0.00 |
| 35 | 118,014,000 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 13,934,576 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 291,323,287 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 44,573,438 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 5,304,177,000 | 8% | 0.00 | 0.00 | 0.46 | 0.05 | 0.10 | 0.25 | 0.12 | 0.02 |
| 41 | 72,401,341 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 43 | 45,845,856 | 29% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 3,871,321,000 | 8% | 0.00 | 0.54 | 0.00 | 0.10 | 0.04 | 0.33 | 0.00 | 0.00 |
| 46 | 476,853,128 | 12% | 0.00 | 0.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| 47 | 27,309,376 | 8% | 0.00 | 0.00 | 0.00 | 0.07 | 0.08 | 0.72 | 0.14 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 34,550,870 | 28% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 1,842,832,631 | 28% | 0.00 | 0.04 | 0.00 | 0.01 | 0.11 | 0.57 | 0.28 | 0.00 |
| 52 | 5,333,994,268 | 8% | 0.00 | 0.03 | 0.00 | 0.09 | 0.10 | 0.52 | 0.26 | 0.00 |
| 53 | 166,326,442 | 3% | 0.00 | 0.00 | 0.00 | 0.06 | 0.06 | 0.58 | 0.26 | 0.04 |
| 55 | 515,196,000 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 56 | 404,541,094 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 57 | 17,283,288,000 | 8% | 0.00 | 0.16 | 0.00 | 0.07 | 0.03 | 0.43 | 0.32 | 0.00 |
| 58 | 351,129,034 | 8% | 0.00 | 0.00 | 0.00 | 0.08 | 0.11 | 0.62 | 0.19 | 0.00 |
| 60 | 2,026,826,933 | 8% | 0.00 | 0.00 | 0.51 | 0.06 | 0.02 | 0.22 | 0.17 | 0.00 |
| 61 | 896,164,048 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 62 | 405,757,430 | 8% | 0.00 | 0.00 | 0.12 | 0.05 | 0.13 | 0.49 | 0.20 | 0.01 |
| 63 | 10,793,748 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 685,608,096 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 65 | 185,029,078 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 66 | 89,856,519 | 8% | 0.00 | 0.00 | 0.00 | 0.05 | 0.09 | 0.41 | 0.30 | 0.04 |
| 67 | 773,467,000 | 8% | 0.01 | 0.00 | 0.00 | 0.20 | 0.06 | 0.51 | 0.22 | 0.00 |
| 68 | 71,370,154 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 408,563,470 | 8% | 0.00 | 0.00 | 0.00 | 0.13 | 0.12 | 0.56 | 0.16 | 0.03 |
| 70 | 365,832,609 | 26% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 131,442,968 | 28% | 0.00 | 0.00 | 0.00 | 0.09 | 0.09 | 0.38 | 0.29 | 0.04 |
| 72 | 18,781,752,000 | 8% | 0.00 | 0.00 | 0.33 | 0.07 | 0.09 | 0.34 | 0.12 | 0.00 |
| 73 | 83,407,268 | 8% | 0.00 | 0.00 | 0.00 | 0.10 | 0.10 | 0.48 | 0.27 | 0.05 |
| 75 | 234,607,159 | 8% | 0.00 | 0.00 | 0.00 | 0.08 | 0.20 | 0.41 | 0.29 | 0.02 |
| 77 | 166,405,780 | 3% | 0.05 | 0.00 | 0.00 | 0.16 | 0.00 | 0.41 | 0.02 | 0.00 |
| 78 | 12,282,985 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 55,615,007 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 1,369,684,000 | 8% | 0.00 | 0.00 | 0.00 | 0.09 | 0.02 | 0.56 | 0.33 | 0.00 |
| 83 | 69,060,098 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 84 | 125,191,354 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 4,388,458,000 | 8% | 0.00 | 0.06 | 0.34 | 0.05 | 0.05 | 0.27 | 0.24 | 0.00 |
| 87 | 960,468,794 | 2% | 0.00 | 0.00 | 0.00 | 0.04 | 0.09 | 0.59 | 0.28 | 0.00 |
| 88 | 270,561,025 | 8% | 0.00 | 0.00 | 0.00 | 0.04 | 0.10 | 0.56 | 0.28 | 0.02 |
| 89 | 1,315,540,000 | 8% | 0.00 | 0.00 | 0.00 | 0.08 | 0.03 | 0.44 | 0.44 | 0.00 |
| 90 | 124,309,883 | 40% | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 | 0.58 | 0.26 | 0.06 |
| 91 | 429,779,439 | 8% | 0.00 | 0.00 | 0.00 | 0.17 | 0.26 | 0.35 | 0.22 | 0.00 |
| 92 | 190,797,288 | 36% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 93 | 6,593,122 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 94 | 16,432,355 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95 | 167,856,749 | 30% | 0.00 | 0.00 | 0.00 | 0.14 | 0.10 | 0.44 | 0.28 | 0.04 |

# APPENDIX II

Year: 2013

| ID | FundValue | ROI | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 281,435,647 | 20% | 0.00 | 0.00 | 0.00 | 0.04 | 0.07 | 0.51 | 0.35 | 0.03 |
| 2 | 30,190,490 | 44% | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 11,385,666 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 758,221,525 | 53% | 0.00 | 0.00 | 0.00 | 0.06 | 0.19 | 0.51 | 0.24 | 0.00 |
| 6 | 539,878,079 | 34% | 0.00 | 0.00 | 0.41 | 0.06 | 0.06 | 0.25 | 0.20 | 0.00 |
| 7 | 510,607,271 | 20% | 0.00 | 0.00 | 0.00 | 0.09 | 0.02 | 0.51 | 0.32 | 0.05 |
| 8 | 1,609,996,000 | 20% | 0.00 | 0.00 | 0.00 | 0.06 | 0.08 | 0.42 | 0.38 | 0.06 |
| 9 | 5,046,003,000 | 20% | 0.00 | 0.05 | 0.33 | 0.05 | 0.07 | 0.25 | 0.25 | 0.00 |
| 10 | 510,022,693 | 20% | 0.00 | 0.00 | 0.00 | 0.11 | 0.07 | 0.55 | 0.25 | 0.02 |
| 11 | 145,726,336 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 126,634,536 | -16% | 0.00 | 0.00 | 0.00 | 0.10 | 0.09 | 0.45 | 0.30 | 0.05 |
| 14 | 21,115,993,000 | 20% | 0.00 | 0.00 | 0.13 | 0.06 | 0.07 | 0.28 | 0.39 | 0.08 |
| 16 | 192,859,114 | 31% | 0.00 | 0.00 | 0.00 | 0.05 | 0.03 | 0.63 | 0.23 | 0.07 |
| 17 | 277,225,330 | 20% | 0.00 | 0.00 | 0.00 | 0.02 | 0.11 | 0.48 | 0.31 | 0.08 |
| 18 | 324,217,726 | 20% | 0.00 | 0.00 | 0.00 | 0.03 | 0.09 | 0.48 | 0.33 | 0.07 |
| 19 | 566,933,938 | 20% | 0.00 | 0.00 | 0.15 | 0.16 | 0.04 | 0.43 | 0.22 | 0.00 |
| 20 | 983,310,766 | 20% | 0.00 | 0.00 | 0.01 | 0.09 | 0.06 | 0.40 | 0.36 | 0.08 |
| 21 | 442,915,094 | -2% | 0.00 | 0.00 | 0.38 | 0.02 | 0.03 | 0.50 | 0.06 | 0.00 |
| 23 | 1,610,547,774 | 25% | 0.00 | 0.00 | 0.00 | 0.09 | 0.13 | 0.52 | 0.23 | 0.02 |
| 26 | 5,013,860,000 | 20% | 0.00 | 0.00 | 0.15 | 0.10 | 0.03 | 0.40 | 0.26 | 0.06 |
| 28 | 181,540,340 | 20% | 0.00 | 0.00 | 0.00 | 0.04 | 0.13 | 0.53 | 0.30 | 0.00 |
| 29 | 143,911,941 | 20% | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.35 | 0.26 | 0.07 |
| 30 | 203,137,711 | 34% | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.58 | 0.09 | 0.00 |
| 32 | 5,193,152,961 | 45% | 0.00 | 0.00 | 0.00 | 0.06 | 0.04 | 0.77 | 0.13 | 0.00 |
| 33 | 80,983,449 | -14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 841,419,771 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 134,108,000 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 131,415,840 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 83,948,169 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 17,933,653 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 6,626,155,000 | 25% | 0.00 | 0.00 | 0.54 | 0.05 | 0.05 | 0.24 | 0.11 | 0.01 |
| 41 | 47,093,787 | -35% | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.55 | 0.27 | 0.05 |
| 43 | 53,806,189 | 17% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 514,770,356 | 20% | 0.00 | 0.00 | 0.07 | 0.06 | 0.08 | 0.48 | 0.29 | 0.03 |
| 46 | 589,321,726 | 24% | 0.00 | 0.00 | 0.00 | 0.09 | 0.01 | 0.53 | 0.25 | 0.05 |
| 48 | 47,720,887 | 38% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 2,554,065,301 | 39% | 0.00 | 0.00 | 0.02 | 0.09 | 0.07 | 0.51 | 0.23 | 0.08 |
| 51 | 6,361,189,369 | 20% | 0.00 | 0.00 | 0.25 | 0.08 | 0.05 | 0.38 | 0.25 | 0.00 |
| 52 | 2,650,960,067 | -50% | 0.00 | 0.00 | 0.56 | 0.05 | 0.00 | 0.20 | 0.19 | 0.00 |
| 53 | 218,405,166 | 31% | 0.00 | 0.00 | 0.00 | 0.06 | 0.06 | 0.54 | 0.30 | 0.04 |

| 54 | 1,838,743,000 | 20% | 0.00 | 0.00 | 0.00 | 0.09 | 0.10 | 0.39 | 0.34 | 0.08 |
|----|---------------|-----|------|------|------|------|------|------|------|------|
| 56 | 2,018,574 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 57 | 5,357,413,730 | 20% | 0.01 | 0.00 | 0.21 | 0.06 | 0.04 | 0.41 | 0.27 | 0.01 |
| 58 | 472,194,818 | 34% | 0.00 | 0.00 | 0.00 | 0.07 | 0.32 | 0.50 | 0.11 | 0.00 |
| 60 | 26,590,257 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.70 | 0.20 | 0.00 |
| 61 | 529,293,574 | -41% | 0.00 | 0.00 | 0.00 | 0.09 | 0.15 | 0.00 | 0.28 | 0.00 |
| 62 | 1,071,613,335 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 63 | 1,551,367,358 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 511,610,667 | -25% | 0.00 | 0.00 | 0.00 | 0.09 | 0.05 | 0.48 | 0.34 | 0.04 |
| 65 | 440,387,530 | 20% | 0.00 | 0.00 | 0.21 | 0.05 | 0.00 | 0.37 | 0.30 | 0.05 |
| 66 | 222,086,287 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 67 | 115,649,067 | -85% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 68 | 619,592,964 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 | 419,264,884 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 149,363,829 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 833,662,000 | 20% | 0.00 | 0.00 | 0.00 | 0.14 | 0.14 | 0.49 | 0.23 | 0.00 |
| 75 | 112,455,859 | -52% | 0.00 | 0.00 | 0.00 | 0.05 | 0.13 | 0.48 | 0.29 | 0.04 |
| 77 | 242,281,675 | 46% | 0.00 | 0.00 | 0.00 | 0.08 | 0.01 | 0.53 | 0.33 | 0.05 |
| 79 | 78,806,753 | 42% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 65,002,300 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 94,732,256 | 20% | 0.00 | 0.00 | 0.00 | 0.12 | 0.11 | 0.47 | 0.26 | 0.06 |
| 83 | 761,251,003 | 20% | 0.00 | 0.00 | 0.00 | 0.10 | 0.06 | 0.54 | 0.30 | 0.00 |
| 84 | 326,395,845 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 8,140,381,000 | 20% | 0.00 | 0.00 | 0.00 | 0.10 | 0.04 | 0.34 | 0.43 | 0.09 |
| 87 | 1,233,916,821 | 28% | 0.02 | 0.00 | 0.00 | 0.05 | 0.04 | 0.57 | 0.32 | 0.00 |
| 88 | 116,881,263 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 89 | 25,115,115 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.46 | 0.51 | 0.00 |
| 90 | 153,063,180 | 23% | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.55 | 0.33 | 0.06 |
| 91 | 232,519,210 | -46% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 92 | 170,844,511 | -10% | 0.20 | 0.00 | 0.00 | 0.15 | 0.00 | 0.29 | 0.01 | 0.00 |
| 94 | 19,023,271 | 16% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95 | 214,525,112 | 28% | 0.00 | 0.00 | 0.00 | 0.11 | 0.07 | 0.43 | 0.35 | 0.03 |

# APPENDIX III

Year: 2014

| Scheme | FundValue | ROI | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 323,509,436 | 15% | 0.00 | 0.00 | 0.00 | 0.06 | 0.11 | 0.46 | 0.33 | 0.03 |
| 2 | 35,745,742 | 18% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 13,251,057 | 16% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 295,382,523 | 14% | 0.00 | 0.00 | 0.00 | 0.12 | 0.19 | 0.40 | 0.28 | 0.00 |
| 5 | 1,188,103,290 | 57% | 0.00 | 0.00 | 0.00 | 0.12 | 0.24 | 0.44 | 0.20 | 0.00 |
| 6 | 536,688,707 | -1% | 0.00 | 0.00 | 0.41 | 0.07 | 0.03 | 0.28 | 0.21 | 0.00 |
| 7 | 526,644,575 | 3% | 0.00 | 0.00 | 0.00 | 0.09 | 0.06 | 0.51 | 0.33 | 0.00 |
| 8 | 1,766,610,000 | 10% | 0.00 | 0.00 | 0.00 | 0.09 | 0.08 | 0.38 | 0.39 | 0.05 |
| 9 | 5,471,346,000 | 8% | 0.00 | 0.00 | 0.35 | 0.04 | 0.04 | 0.25 | 0.27 | 0.05 |
| 10 | 577,957,921 | 13% | 0.00 | 0.00 | 0.00 | 0.12 | 0.11 | 0.43 | 0.31 | 0.03 |
| 11 | 164,338,334 | 13% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 144,588,255 | 14% | 0.00 | 0.00 | 0.00 | 0.09 | 0.06 | 0.53 | 0.31 | 0.00 |
| 13 | 496,517,970 | 14% | 0.00 | 0.00 | 0.00 | 0.05 | 0.23 | 0.43 | 0.29 | 0.00 |
| 14 | 25,265,215,000 | 20% | 0.00 | 0.00 | 0.14 | 0.06 | 0.03 | 0.29 | 0.39 | 0.08 |
| 16 | 223,671,784 | 16% | 0.00 | 0.00 | 0.00 | 0.05 | 0.09 | 0.52 | 0.26 | 0.07 |
| 17 | 304,116,185 | 10% | 0.00 | 0.00 | 0.00 | 0.06 | 0.10 | 0.46 | 0.31 | 0.07 |
| 18 | 381,366,502 | 18% | 0.00 | 0.00 | 0.00 | 0.05 | 0.11 | 0.46 | 0.31 | 0.06 |
| 20 | 1,247,507,082 | 27% | 0.00 | 0.00 | 0.14 | 0.07 | 0.03 | 0.35 | 0.33 | 0.07 |
| 21 | 495,338,406 | 12% | 0.00 | 0.00 | 0.41 | 0.02 | 0.05 | 0.45 | 0.07 | 0.00 |
| 23 | 1,833,014,805 | 14% | 0.00 | 0.00 | 0.00 | 0.13 | 0.08 | 0.51 | 0.26 | 0.02 |
| 24 | 122,575,099 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 6,096,468,000 | 22% | 0.00 | 0.00 | 0.14 | 0.10 | 0.04 | 0.40 | 0.29 | 0.03 |
| 28 | 210,282,114 | 16% | 0.00 | 0.00 | 0.00 | 0.05 | 0.17 | 0.48 | 0.31 | 0.00 |
| 29 | 174,949,710 | 22% | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.43 | 0.36 | 0.07 |
| 30 | 276,668,891 | 36% | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 | 0.43 | 0.10 | 0.05 |
| 31 | 68,283,580 | 14% | 0.00 | 0.00 | 0.00 | 0.09 | 0.09 | 0.50 | 0.32 | 0.00 |
| 32 | 6,466,341,120 | 25% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 33 | 89,116,253 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 1,299,648,626 | 54% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 154,052,460 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 173,990,363 | 32% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 38 | 98,384,115 | 17% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 21,242,587 | 18% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 7,482,113,000 | 13% | 0.00 | 0.00 | 0.60 | 0.05 | 0.03 | 0.21 | 0.11 | 0.01 |
| 41 | 64,964,703 | 38% | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.51 | 0.29 | 0.04 |
| 44 | 583,049,921 | 13% | 0.00 | 0.00 | 0.06 | 0.07 | 0.11 | 0.44 | 0.30 | 0.02 |
| 46 | 235,482,680 | -60% | 0.00 | 0.00 | 0.00 | 0.10 | 0.04 | 0.56 | 0.31 | 0.00 |
| 48 | 59,752,815 | 25% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 3,253,552,751 | 27% | 0.00 | 0.00 | 0.11 | 0.08 | 0.05 | 0.41 | 0.27 | 0.07 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 51 | 6,809,171,683 | 7% | 0.00 | 0.00 | 0.23 | 0.08 | 0.02 | 0.36 | 0.31 | 0.00 |
| 52 | 2,894,833,711 | 9% | 0.00 | 0.00 | 0.57 | 0.05 | 0.03 | 0.18 | 0.17 | 0.00 |
| 53 | 242,022,018 | 11% | 0.00 | 0.00 | 0.00 | 0.07 | 0.08 | 0.47 | 0.33 | 0.05 |
| 54 | 2,304,514,000 | 25% | 0.00 | 0.00 | 0.00 | 0.11 | 0.03 | 0.41 | 0.37 | 0.08 |
| 55 | 831,495,796 | 14% | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 | 0.48 | 0.37 | 0.04 |
| 56 | 2,657,264 | 32% | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 60 | 28,197,768 | 6% | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.72 | 0.26 | 0.00 |
| 61 | 690,554,887 | 30% | 0.00 | 0.00 | 0.00 | 0.11 | 0.08 | 0.47 | 0.34 | 0.00 |
| 62 | 1,287,744,754 | 20% | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.52 | 0.33 | 0.03 |
| 63 | 2,003,337,044 | 29% | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 598,381,365 | 17% | 0.00 | 0.00 | 0.00 | 0.13 | 0.02 | 0.44 | 0.35 | 0.05 |
| 65 | 456,830,067 | 4% | 0.00 | 0.00 | 0.26 | 0.04 | 0.06 | 0.29 | 0.30 | 0.06 |
| 66 | 258,927,007 | 17% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 67 | 76,839,957 | -34% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 68 | 729,415,263 | 18% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 194,944,481 | 14% | 0.30 | 0.00 | 0.00 | 0.08 | 0.04 | 0.48 | 0.00 | 0.00 |
| 70 | 465,515,596 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 180,522,755 | 21% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 829,909,000 | 0% | 0.00 | 0.00 | 0.00 | 0.19 | 0.06 | 0.44 | 0.30 | 0.00 |
| 75 | 137,507,286 | 22% | 0.00 | 0.00 | 0.00 | 0.05 | 0.14 | 0.46 | 0.32 | 0.04 |
| 76 | 10,550,034 | 14% | 0.00 | 0.00 | 0.00 | 0.25 | 0.30 | 0.44 | 0.00 | 0.00 |
| 77 | 264,681,403 | 9% | 0.00 | 0.00 | 0.00 | 0.09 | 0.07 | 0.51 | 0.34 | 0.00 |
| 78 | 56,980,577 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 88,018,801 | 12% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 73,633,564 | 13% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 116,177,874 | 23% | 0.00 | 0.00 | 0.00 | 0.07 | 0.13 | 0.46 | 0.28 | 0.05 |
| 83 | 991,233,965 | 30% | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.47 | 0.35 | 0.00 |
| 84 | 373,887,726 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 14,300,140,000 | 76% | 0.00 | 0.00 | 0.00 | 0.11 | 0.06 | 0.36 | 0.39 | 0.08 |
| 87 | 1,389,866,056 | 13% | 0.00 | 0.00 | 0.00 | 0.04 | 0.14 | 0.42 | 0.34 | 0.05 |
| 88 | 140,715,453 | 20% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 89 | 26,474,591 | 5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.48 | 0.37 | 0.00 |
| 90 | 182,836,732 | 19% | 0.06 | 0.00 | 0.00 | 0.07 | 0.08 | 0.42 | 0.32 | 0.05 |
| 91 | 267,899,589 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 92 | 180,124,086 | 5% | 0.00 | 0.00 | 0.00 | 0.10 | 0.24 | 0.28 | 0.38 | 0.00 |
| 93 | 25,874,834 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 94 | 19,890,089 | 5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95 | 261,464,491 | 22% | 0.00 | 0.00 | 0.00 | 0.12 | 0.08 | 0.42 | 0.39 | 0.00 |

# APPENDIX IV

Year: 2015

| ID | FundValue | ROI | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 321,253,084 | -1% | 0.00 | 0.00 | 0.00 | 0.07 | 0.20 | 0.43 | 0.27 | 0.03 |
| 2 | 38,359,816 | 7% | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 15,177,594 | 15% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 356,777,827 | 21% | 0.00 | 0.01 | 0.00 | 0.16 | 0.02 | 0.51 | 0.31 | 0.00 |
| 5 | 1,403,664,092 | 18% | 0.00 | 0.00 | 0.00 | 0.09 | 0.12 | 0.64 | 0.15 | 0.00 |
| 7 | 522,913,739 | -1% | 0.00 | 0.00 | 0.00 | 0.13 | 0.08 | 0.47 | 0.32 | 0.00 |
| 8 | 1,890,877,000 | 7% | 0.00 | 0.00 | 0.00 | 0.08 | 0.18 | 0.42 | 0.32 | 0.00 |
| 9 | 5,118,737,000 | -6% | 0.00 | 0.00 | 0.39 | 0.03 | 0.02 | 0.22 | 0.25 | 0.07 |
| 10 | 654,669,759 | 13% | 0.00 | 0.00 | 0.00 | 0.17 | 0.07 | 0.43 | 0.31 | 0.02 |
| 11 | 181,360,491 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 148,675,843 | 3% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 510,539,194 | 3% | 0.00 | 0.00 | 0.00 | 0.08 | 0.24 | 0.42 | 0.25 | 0.00 |
| 14 | 28,004,177,000 | 11% | 0.00 | 0.00 | 0.17 | 0.07 | 0.01 | 0.27 | 0.39 | 0.09 |
| 16 | 258,288,742 | 15% | 0.00 | 0.00 | 0.00 | 0.08 | 0.10 | 0.47 | 0.26 | 0.08 |
| 17 | 273,396,090 | -10% | 0.00 | 0.00 | 0.00 | 0.06 | 0.10 | 0.48 | 0.29 | 0.07 |
| 18 | 398,303,298 | 4% | 0.00 | 0.00 | 0.00 | 0.06 | 0.17 | 0.44 | 0.25 | 0.07 |
| 19 | 648,415,142 | -9% | 0.00 | 0.00 | 0.14 | 0.15 | 0.06 | 0.49 | 0.16 | 0.00 |
| 20 | 1,302,288,064 | 4% | 0.00 | 0.00 | 0.15 | 0.07 | 0.06 | 0.42 | 0.30 | 0.00 |
| 21 | 469,316,059 | -5% | 0.00 | 0.00 | 0.34 | 0.07 | 0.08 | 0.44 | 0.07 | 0.00 |
| 23 | 2,022,952,452 | 10% | 0.00 | 0.00 | 0.00 | 0.23 | 0.08 | 0.42 | 0.26 | 0.00 |
| 24 | 162,550,306 | 33% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 8,473,820,200 | 39% | 0.00 | 0.00 | 0.23 | 0.11 | 0.03 | 0.32 | 0.32 | 0.00 |
| 28 | 218,206,288 | 4% | 0.00 | 0.00 | 0.00 | 0.07 | 0.23 | 0.42 | 0.27 | 0.01 |
| 29 | 190,110,591 | 9% | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 30 | 341,993,272 | 24% | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 | 0.57 | 0.10 | 0.06 |
| 31 | 101,012,377 | 48% | 0.00 | 0.00 | 0.00 | 0.12 | 0.15 | 0.42 | 0.30 | 0.00 |
| 32 | 7,784,756,132 | 20% | 0.00 | 0.00 | 0.13 | 0.05 | 0.08 | 0.62 | 0.12 | 0.00 |
| 33 | 81,463,074 | -9% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 1,436,097,194 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 166,570,259 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 36 | 199,048,771 | 14% | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 |
| 38 | 104,744,336 | 6% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 26,417,936 | 24% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 7,347,875,000 | -2% | 0.00 | 0.00 | 0.69 | 0.04 | 0.01 | 0.19 | 0.07 | 0.01 |
| 41 | 71,557,983 | 10% | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.96 | 0.00 | 0.00 |
| 43 | 59,617,864 | 2% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 639,485,533 | 10% | 0.00 | 0.00 | 0.06 | 0.07 | 0.17 | 0.41 | 0.25 | 0.02 |
| 46 | 303,555,282 | 29% | 0.00 | 0.00 | 0.00 | 0.18 | 0.06 | 0.45 | 0.32 | 0.00 |
| 47 | 707,227,957 | 2% | 0.00 | 0.00 | 0.00 | 0.10 | 0.02 | 0.51 | 0.32 | 0.04 |
| 48 | 69,336,497 | 16% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 3,826,886,473 | 18% | 0.00 | 0.00 | 0.10 | 0.09 | 0.06 | 0.34 | 0.34 | 0.07 |
| 51 | 7,347,941,386 | 8% | 0.00 | 0.00 | 0.25 | 0.09 | 0.05 | 0.32 | 0.29 | 0.00 |
| 52 | 2,838,310,750 | -2% | 0.00 | 0.00 | 0.59 | 0.05 | 0.00 | 0.22 | 0.14 | 0.00 |
| 53 | 260,160,269 | 7% | 0.00 | 0.00 | 0.00 | 0.08 | 0.11 | 0.44 | 0.32 | 0.05 |
| 54 | 2,680,412,000 | 16% | 0.00 | 0.00 | 0.00 | 0.13 | 0.02 | 0.36 | 0.40 | 0.09 |
| 55 | 778,081,067 | -6% | 0.00 | 0.00 | 0.00 | 0.09 | 0.15 | 0.44 | 0.32 | 0.00 |
| 56 | 3,502,516 | 32% | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| 57 | 6,891,951,568 | 2% | 0.00 | 0.00 | 0.55 | 0.06 | 0.09 | 0.04 | 0.25 | 0.00 |
| 58 | 594,686,967 | 2% | 0.27 | 0.00 | 0.00 | 0.07 | 0.18 | 0.34 | 0.15 | 0.00 |
| 60 | 19,151,548 | -32% | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.73 | 0.25 | 0.00 |
| 61 | 705,504,555 | 2% | 0.00 | 0.00 | 0.00 | 0.13 | 0.11 | 0.49 | 0.27 | 0.00 |
| 62 | 1,409,254,100 | 9% | 0.00 | 0.00 | 0.00 | 0.11 | 0.29 | 0.34 | 0.22 | 0.04 |
| 63 | 2,596,903,888 | 30% | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 564,653,177 | -6% | 0.00 | 0.00 | 0.00 | 0.12 | 0.05 | 0.50 | 0.34 | 0.00 |
| 65 | 413,618,124 | -9% | 0.00 | 0.00 | 0.29 | 0.02 | 0.03 | 0.33 | 0.27 | 0.05 |
| 66 | 294,181,774 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 67 | 91,747,424 | 19% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 68 | 807,967,376 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 203,810,144 | 5% | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.42 | 0.01 | 0.00 |
| 70 | 442,424,406 | -5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 616,138,182 | 2% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 721,113,000 | -13% | 0.00 | 0.00 | 0.00 | 0.17 | 0.03 | 0.51 | 0.30 | 0.00 |
| 75 | 159,822,982 | 16% | 0.04 | 0.00 | 0.00 | 0.06 | 0.21 | 0.39 | 0.26 | 0.03 |
| 76 | 13,580,119 | 29% | 0.00 | 0.00 | 0.00 | 0.13 | 0.28 | 0.57 | 0.02 | 0.00 |
| 77 | 269,986,638 | 2% | 0.00 | 0.00 | 0.00 | 0.10 | 0.04 | 0.52 | 0.33 | 0.00 |
| 78 | 78,135,492 | 37% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 79,498,000 | -10% | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 80,707,768 | 10% | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 107,419,495 | -8% | 0.00 | 0.00 | 0.00 | 0.08 | 0.16 | 0.47 | 0.25 | 0.05 |
| 83 | 1,082,181,780 | 9% | 0.00 | 0.00 | 0.00 | 0.15 | 0.10 | 0.48 | 0.23 | 0.00 |
| 84 | 415,985,825 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 14,986,827,000 | 5% | 0.00 | 0.00 | 0.00 | 0.09 | 0.11 | 0.44 | 0.35 | 0.00 |
| 87 | 1,539,514,152 | 11% | 0.00 | 0.00 | 0.00 | 0.04 | 0.16 | 0.44 | 0.30 | 0.06 |
| 88 | 156,025,634 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 89 | 97,769,437 | 2% | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.47 | 0.43 | 0.00 |
| 90 | 192,245,397 | 5% | 0.00 | 0.00 | 0.00 | 0.06 | 0.20 | 0.43 | 0.25 | 0.05 |
| 91 | 301,425,562 | 13% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 92 | 165,680,741 | -8% | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 93 | 36,459,511 | 41% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 94 | 21,906,968 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95 | 263,857,592 | 1% | 0.00 | 0.00 | 0.00 | 0.14 | 0.13 | 0.41 | 0.32 | 0.00 |

# APPENDIX V

Year: 2016

| ID | FundValue | ROI | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 |
|----|-----------|-----|------|------|------|------|------|------|------|------|
| 1 | 338,152,999 | 5% | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.67 | 0.22 | 0.03 |
| 3 | 17,273,857 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 5 | 1,824,868,098 | 30% | 0.00 | 0.00 | 0.00 | 0.04 | 0.09 | 0.45 | 0.10 | 0.00 |
| 6 | 579,349,920 | 8% | 0.00 | 0.00 | 0.49 | 0.06 | 0.02 | 0.33 | 0.10 | 0.00 |
| 7 | 508,747,920 | -3% | 0.00 | 0.00 | 0.00 | 0.11 | 0.04 | 0.57 | 0.27 | 0.00 |
| 8 | 2,431,499,000 | 29% | 0.00 | 0.00 | 0.00 | 0.09 | 0.09 | 0.51 | 0.30 | 0.00 |
| 9 | 9,825,674,000 | 92% | 0.00 | 0.08 | 0.44 | 0.03 | 0.03 | 0.22 | 0.20 | 0.00 |
| 11 | 204,897,322 | 13% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12 | 164,778,837 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 568,162,380 | 11% | 0.00 | 0.00 | 0.00 | 0.07 | 0.02 | 0.70 | 0.21 | 0.00 |
| 14 | 27,206,170,000 | -3% | 0.00 | 0.00 | 0.20 | 0.07 | 0.02 | 0.36 | 0.35 | 0.00 |
| 16 | 267,968,175 | 4% | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.60 | 0.25 | 0.05 |
| 17 | 290,003,399 | 6% | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.59 | 0.26 | 0.07 |
| 18 | 425,041,995 | 7% | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.66 | 0.21 | 0.06 |
| 19 | 718,964,724 | 11% | 0.00 | 0.00 | 0.13 | 0.13 | 0.08 | 0.51 | 0.16 | 0.00 |
| 20 | 1,467,352,578 | 13% | 0.00 | 0.00 | 0.14 | 0.06 | 0.06 | 0.52 | 0.22 | 0.00 |
| 21 | 467,692,271 | 0% | 0.00 | 0.00 | 0.32 | 0.04 | 0.04 | 0.53 | 0.08 | 0.00 |
| 23 | 2,107,263,240 | 4% | 0.00 | 0.02 | 0.00 | 0.21 | 0.04 | 0.53 | 0.19 | 0.02 |
| 24 | 207,114,236 | 27% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 26 | 7,389,553,000 | -13% | 0.00 | 0.00 | 0.24 | 0.07 | 0.04 | 0.43 | 0.22 | 0.00 |
| 27 | 14,332,380 | 8% | 0.00 | 0.00 | 0.00 | 0.01 | 0.10 | 0.90 | 0.00 | 0.00 |
| 28 | 222,577,687 | 2% | 0.00 | 0.00 | 0.00 | 0.07 | 0.03 | 0.65 | 0.25 | 0.00 |
| 29 | 215,068,474 | 13% | 0.00 | 0.00 | 0.00 | 0.05 | 0.02 | 0.58 | 0.28 | 0.04 |
| 30 | 447,350,750 | 31% | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.61 | 0.10 | 0.05 |
| 31 | 127,899,926 | 27% | 0.00 | 0.00 | 0.00 | 0.09 | 0.06 | 0.66 | 0.19 | 0.00 |
| 32 | 9,399,148,580 | 21% | 0.00 | 0.00 | 0.12 | 0.03 | 0.03 | 0.72 | 0.09 | 0.00 |
| 33 | 41,398,880 | -49% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 34 | 1,478,347,144 | 3% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35 | 173,445,673 | 4% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| 36 | 198,356,011 | 0% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 39 | 32,704,897 | 24% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40 | 7,862,225,000 | 7% | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.69 | 0.18 | 0.00 |
| 41 | 90,518,208 | 26% | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.76 | 0.17 | 0.04 |
| 42 | 13,141,799 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.65 | 0.18 | 0.00 |
| 43 | 51,339,403 | -14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 44 | 690,637,184 | 8% | 0.00 | 0.00 | 0.12 | 0.06 | 0.04 | 0.00 | 0.21 | 0.02 |
| 46 | 697,171,960 | 8% | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.63 | 0.21 | 0.04 |
| 48 | 84,656,558 | 22% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 50 | 8,229,355,396 | 8% | 0.00 | 0.00 | 0.11 | 0.07 | 0.04 | 0.48 | 0.30 | 0.00 |
| 51 | 7,283,960,460 | -1% | 0.00 | 0.00 | 0.30 | 0.07 | 0.04 | 0.35 | 0.24 | 0.00 |

| 52 | 2,897,123,274 | 2% | 0.00 | 0.00 | 0.58 | 0.05 | 0.00 | 0.26 | 0.11 | 0.00 |
|----|---------------|-----|------|------|------|------|------|------|------|------|
| 53 | 263,748,484 | 1% | 0.00 | 0.00 | 0.00 | 0.07 | 0.08 | 0.52 | 0.28 | 0.05 |
| 54 | 2,928,198,273 | 9% | 0.00 | 0.00 | 0.00 | 0.10 | 0.05 | 0.55 | 0.30 | 0.00 |
| 55 | 743,791,078 | -4% | 0.00 | 0.00 | 0.00 | 0.08 | 0.03 | 0.57 | 0.32 | 0.00 |
| 57 | 7,666,057,472 | 11% | 0.00 | 0.00 | 0.47 | 0.03 | 0.05 | 0.32 | 0.13 | 0.00 |
| 58 | 656,743,804 | 10% | 0.23 | 0.00 | 0.00 | 0.05 | 0.04 | 0.52 | 0.16 | 0.00 |
| 60 | 20,314,426 | 6% | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.77 | 0.15 | 0.00 |
| 61 | 682,325,203 | -3% | 0.00 | 0.00 | 0.00 | 0.12 | 0.04 | 0.65 | 0.20 | 0.00 |
| 62 | 1,620,747,107 | 15% | 0.00 | 0.00 | 0.00 | 0.09 | 0.03 | 0.68 | 0.16 | 0.04 |
| 63 | 3,156,568,857 | 22% | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 64 | 597,581,176 | 6% | 0.00 | 0.00 | 0.00 | 0.09 | 0.06 | 0.55 | 0.30 | 0.00 |
| 65 | 376,845,414 | -9% | 0.00 | 0.00 | 0.32 | 0.01 | 0.03 | 0.35 | 0.23 | 0.06 |
| 66 | 321,078,136 | 9% | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.17 | 0.00 | 0.00 |
| 67 | 101,105,177 | 10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 69 | 211,527,714 | 4% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 | 357,331,672 | -19% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 71 | 236,062,574 | -62% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 73 | 659,951,000 | -8% | 0.00 | 0.00 | 0.00 | 0.14 | 0.03 | 0.59 | 0.24 | 0.00 |
| 75 | 204,876,835 | 28% | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.74 | 0.18 | 0.03 |
| 76 | 17,716,496 | 30% | 0.02 | 0.00 | 0.00 | 0.17 | 0.30 | 0.47 | 0.04 | 0.00 |
| 77 | 225,818,545 | -16% | 0.00 | 0.00 | 0.00 | 0.11 | 0.03 | 0.63 | 0.23 | 0.00 |
| 78 | 106,786,532 | 37% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 79 | 83,275,531 | 5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 80 | 86,136,068 | 7% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 82 | 123,711,269 | 15% | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.69 | 0.18 | 0.04 |
| 83 | 1,285,358,956 | 19% | 0.00 | 0.00 | 0.00 | 0.13 | 0.08 | 0.62 | 0.16 | 0.00 |
| 84 | 475,868,890 | 14% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 85 | 15,190,943,000 | 1% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| 87 | 1,613,534,408 | 5% | 0.00 | 0.00 | 0.00 | 0.03 | 0.14 | 0.53 | 0.24 | 0.06 |
| 88 | 140,017,488 | -10% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 89 | 17,972,490 | 8% | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.64 | 0.33 | 0.00 |
| 90 | 203,732,789 | 6% | 0.00 | 0.00 | 0.00 | 0.06 | 0.04 | 0.66 | 0.19 | 0.05 |
| 91 | 333,921,564 | 11% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 92 | 173,511,182 | 5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| 95 | 290,824,723 | 10% | 0.00 | 0.00 | 0.00 | 0.11 | 0.16 | 0.45 | 0.28 | 0.00 |