EFFECT OF FUND CHARACTERISTICS ON FINANCIAL PERFORMANCE OF PENSION SCHEMES IN KENYA

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DECLARATION

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

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This research project has been submitted for examination with my approval as the University Supervisors.

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DEDICATION

My study endeavor is a tribute to my family, who have always been there for me and have always encouraged me.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variances
DB	Defined Benefits
DC	Defined Contribution
ILO	International Labour Organization
MPT	Modern Portfolio Theory
OECD	Organization for Economic Cooperation and Development
PFA	Pension Funds Administrator
RBA	Retirement Benefits Authority
ROA	Return on assets
SPSS	Statistical Package Social Science
UK	United Kingdom
US	United States
VIF	Variance Inflation Factor

ABSTRACT

Every year, billions of dollars are lost due to poor performance in Kenya's pension scheme. Liquidity problems, portability issues, and the anticipated retirement of a large group of members have altered the situation for the better. Financial returns increased between 2006 and 2015, according to the Reserve Bank of Australia's 2016 and 2019 reports, which might be ascribed to superior investment strategies implemented by service providers at the time. Returns on investments, on the other hand, have decreased in 2018. As a consequence of the fund characteristics of the pension schemes, such outcomes might be explained in part. The purpose of this study was to determine the relationship between fund characteristics and the performance of pension schemes in Kenya. The portfolio mix, liquidity, fund size, and operational expenses were all considered independent factors in this analysis. Descriptive research design was used. The target population was the 1340 pension schemes in Kenya. The sample size was 93 arrived at using Yamane formula. Research variables data were derived from Retirement Benefits Authority (RBA) from 2016 to 2020. Regression and correlation analysis were used to test the study hypotheses by establishing the relationship between portfolio mix and performance. The study found that portfolio mix (β=0.118, p=0.000) and fund size (β=0.033, p=0.007) had a positive and significant effect on the performance among pension schemes in Kenya. The study also found that liquidity (β=0.003, p=0.463) and operating costs (β=0.001, p=0.905) had no significant effect on the performance among pension schemes in Kenya. The results also indicated R^2 of 0.333 which implied that the selected independent variables contributed 33.3% to variations in performance. The study recommends that pension schemes' policy makers should come up with policies that increase portfolio mix as this will lead to an increase in performance. The study further recommends that management and directors of pension schemes should develop strategies aimed at increasing fund size as this leads to a rise in performance.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Investment in a company's expansion is crucial for its long-term success. An explanation of why two companies in the same industry get different outcomes is critical. This is a major concern and a number of studies in finance focus on understanding this discrepancy. A variety of variables, both internal and external, have been identified as contributing to the disparities in performance. Petraki (2012) observes that financial performance of pension schemes is significantly affected by fund size and portfolio mix. Ichingwa and Mbithi, (2017) on the other hand observe that liquidity and operating costs are the two main determinants of pension schemes financial performance.

Modern portfolio theory, agency theory, and tradeoff theory were all used in this study's research process. Asset allocation choices are guided by Markowitz's modern portfolio theory (1952) because investors want to maximize returns while minimizing individual asset losses. According to Jensen and Meckling (1976), the Trustees' choices on payments to service providers, member contributions, asset allocations, and even risk preferences all effect the financial viability of pension schemes. For the sake of this investigation, Myers' (1984) trade-off theory is important, since it clarifies why pension plans must achieve a balance between liquidity and financial performance.

According to RBA (2018) data, over Sh700 billion in assets were held by over 3000 registered and unregistered pension plans in Kenya. The financial contributions made by these pension plans amounted to 51.4% of total GDP (forbes, 2018). Investment returns from pension plans varied from 6.7% to 15%, with an average return of

10.67%, according to RBA 2016 statistics. Percentage-wise, the average was 7.87%. Investment returns for private pensions were just 16.33 %. According to RBA investment reports from 2014 and 2015, roughly 62.3% of all Kenyan pension plans underperformed the market.

1.1.1 Fund Characteristics

Dioha, Ahmed and Okpanachi (2018) claim that fund features are mostly affected by the activities of a firm's management. Fund-specific factors have been uncovered by a number of academics. For example, Ayuba, Balago, and Dagwom (2018) identified fund size, liquidity, operational expenses, and portfolio composition as factors. Almajali (2012) defines fund characteristics as "micro variables" since they don't apply to all pension schemes in a particular nation. In this regard, fund characteristics are the variables that schemes may influence. Management choices are mostly responsible for their creation.

Size of fund is among factors prominently identified in literature. Lou (2012) explained that long-term pension scheme performance is influenced by addition of more funds to the portfolio so as to enjoy economies of scale. The ability of the fund to enjoy economies of scale may influence the returns of funds from advantages of economies of scale (Mentel & Horváthová, 2016). Operating cost also impact on financial performance. Some empirical literature have shown that funds that are actively managed may be out performed by funds that are passively managed since the later enjoy lower operational costs (Sialm & Tham, 2015). The funds that are actively managed involves cost like research expenses and operating cost proxied by expense to income ratio.

Portfolio mix is another fund characteristic identified in literature. Markowitz, (1952) posits that the performance of fund is affected by unsystematic risk associated with individual assets. According to Maina (2013), the portfolio mix affects the financial performance of pension schemes. A pension fund's liquidity might be defined as the amount of money it has on hand but has not yet invested. There are regulations in place that dictate that certain monies must be stored in cash and be ready for withdrawal or maturity when customers need it. Liquidity has been seen to be prone to mismanagement and therefore negatively affects financial performance of pension schemes (Omwenga, 2013).

1.1.2 Financial Performance

Almajali, Alamro, and Al-Soub (2012) define this as a company's capacity to meet or exceed its stated financial objectives, which may include profit margins. Financial targets have been fulfilled or surpassed as a percentage of the company's total revenue. This way, you'll be able to monitor how successfully your financial objectives are being reached. To put it another way, the financial projections of Baba and Nasieku (2016) demonstrate how a firm uses its assets to generate profits, which assists stakeholders in making investment decisions. FP, according to Nzuve (2016), is a key indicator of a firm's health and may be used to identify its strengths and flaws.

Financial performance is paramount since it is applied in portraying the efficiency and effectiveness of an organization’s resources. And this in turn has the likelihood of increasing an organization’s benefits (Nyamita, 2014). FP is critical in any business setup, it aids the shareholders in the determination of the investment whether to continue with the investment or not and is gauged from the current performance (Lin,

2008). Investment analysts also rely on the FP information in analyzing an entity's ability to realize revenue and its capacity to expand which is critical for future growth. The long-term viability of any company depends on its ability to make a profit, since successful businesses are more likely to attract other investors who can provide further cash to help in future development and growth, allowing the firm to remain competitive (Omondi & Muturi, 2013).

Return on assets (ROA) is an example of a financial performance statistic. Using the formula below, divide operating profit by total assets to determine ROA (Crook, 2008). When assessing the financial health of a pension fund, returns on investment are a significant consideration. Internal Rate of Return (IRR), cumulative total value of capital spent, and public market equivalent are some of the most often used metrics in financial analysis. All of the fund's cash flows and current value are taken into account when calculating the fund's IRR. Public market equivalent refers to an index fund's investment in a private equity fund. The ROI (return on investment) metric was employed in this research to evaluate financial performance.

1.1.3 Fund Characteristics and Financial Performance

Organizations may be said to operate their enterprises on the basis of a portfolio according to current portfolio theory. With the goal of optimizing returns on each of the numerous portfolios, it is critical for pension funds to implement sensible portfolio mix policies. MPT is significant to the research because diversification of investment funds' assets might improve financial performance. Understanding MPT helps pension plans choose the best possible mix of assets to minimize risk and maximize returns (Bodie, 2015).

Hlavac (2011) compared the Czech Republic's private pension returns to other European states. Members' contributions and operating expenditures paid in providing management services were shown to have a significant impact on these schemes' financial results. HUSTEAD (2009) discovered that in systems with defined contributions (DC) rather than define benefits (DB), administrative expenses had a greater impact on cash flows (2009).

According to worldwide research, regulated and professional pension schemes, such as occupational and private ones, are more likely to succeed (Campbell & Viceira, 2012). Services supplied by professionals were compensated by charging a charge that actually reduces the cash flow of pension plans in certain cases. Contributions from members and sponsors, especially for occupational pension schemes, are their primary source of revenue. A research conducted in the United Kingdom (UK) indicated that pension schemes with higher investment returns attract and retain senior employees of the organization. (Blake, 2012). In addition, pension plans throughout the globe are focused on strategic asset allocation (Campbell & Viceira, 2012). Investment decisions made by fund managers may have a significant impact on the returns of an asset allocation.

1.1.4 Pension Schemes in Kenya

The Retirement Benefits Authority (RBA) regulates pension fund businesses. RBA was founded by an Act of Parliament and its detailed provisions, the Retirement Benefit Act. On the RBA's list are the Civil Service Pension Scheme, National Social Security Fund, Occupational Retirement Schemes and Individual Retirement Schemes. The Civil Service Pension Scheme and the National Social Security Fund are available to civil servants, teachers, and other professions, while the National

Social Security Fund is accessible to the general population. Individuals from the official and informal sectors, as well as employees of organizations with plans, make up the membership (Retirement Benefits Act Chapter 197, Kenya).

A public and private pension scheme may be created in Kenya, according to the Organization for Economic Co-operation and Development (OECD, 2015). Social security programs that are administered by the government are known as public plans since the government is the biggest employer in the United States (Mutuku, 2014). Personal and occupational pension plans are the only two forms of pension plans that fall under the category of private plans (OECD, 2015).

According to reports from Kenya, pension funds lose billions of dollars annually owing to poor performance. It's been a long time since we've had an issue with cash flow, but that's about to change (RoK, 2017). It is impossible for pension funds to meet their financial obligations on time without incurring significant unexpected costs.

1.2 Research Problem

Financial performance is vital in the finance business. It is critical to explain why two businesses in the same sector have different performance. This is a major concern and a number of studies in finance focus on understanding this discrepancy. This has impacted research that have focused on a variety of internal and environmental variables that are responsible for the disparities in performance. Petraki (2012) observes that financial performance of pension schemes is significantly affected by fund size and portfolio mix. Ichingwa and Mbithi (2017), on the other hand, find that liquidity and operational expenses are the two most important indicators of a pension scheme's financial performance.

Due to poor performance, Kenya's pension schemes lose billions of dollars every year. Although there has always been a steady flow of cash, there are currently concerns regarding liquidity, portability, and an aging membership (RoK, 2017). According to the RBA's 2016 and 2019 reports, financial returns increased between 2006 and 2015, perhaps due to improved investing practices by service providers. In 2018, however, investment returns declined by 2.387 percent, while industrial returns rose by 0.783 % to 9.684%. The asset mix chosen by pension funds may be partly to blame.

This area has empirical literature. Hlavac (2016) performed a worldwide study to determine investing methods employed by Czech investment funds and their financial performance. This research focuses on investment funds, which are not the same as pension plans. Mercer (2018) studied the financial growth of an occupational retirement benefits scheme in Australia. The research found a statistically significant link between the variables. It failed to explain how fund characteristics influenced pension scheme financial performance, leaving a conceptual vacuum.

According to Tijjani (2014), the financial sustainability of pension fund managers in Nigeria was studied regionally. In the research results, the age, size of the company, net income, contribution, and board size were shown to be positively associated with each other. The study's focus on financial sustainability, as opposed to financial performance, creates a conceptual chasm. The Tanzanian social security programs were studied by Sabugo (2017), who looked at the factors that influence investment income growth. Members' contributions, benefits payments, and the value of social security schemes were found to have a positive effect on investment income in social security schemes. Lack of investigation on the relationship between fund

characteristics and pension plan financial performance shows the need for more investigation.

Ichingwa and Mbithi (2017) conducted an investigation of the impact of total contributions on the performance of Kenyan pension plans. The total amount of contributions has a considerable and beneficial impact on the financial performance of the pension scheme. A methodological issue limited the analysis to 2016 data, which does not represent the company's long-term financial performance. According to Namusonge, Sakwa, and Gathogo, they conducted research on the financial performance of registered occupational pension schemes in Kenya (2017). According to the report, the asset mix has an impact on the financial performance of occupational pension schemes. Other fund features, on the other hand, were not taken into consideration in the research. The reason for this research is that while previous studies were carried out, nearly all previous studies exhibit conceptual, contextual and methodological gaps. Based on these gaps, the current study seeks to answer the question: How do fund characteristics impact pension plan financial performance in Kenya?

1.3 Research Objective

This study investigated the relationship between fund characteristics and the financial performance of Kenyan pension schemes.

1.4 Value of the Study

The results may help Kenyan pension schemes enhance their financial performance and retiree well-being. Rethinking the decision to introduce pension plans in Kenya may be one of the results. Some of the issues that the pension scheme is experiencing

may benefit from the use of this information when it comes to developing regulations and procedures.

Researchers, academics, and students alike may benefit from the discoveries and utilize them to improve their own study in relevant disciplines. Researchers and academicians will be using the results to define new research areas on different subjects discussing the same issue by doing a study of the existing literature in identification of research gaps.

RBA officials may find it useful to learn how the industry is implementing prudential guidelines designed to mitigate credit and liquidity risk, as well as the different controls pension schemes use to manage these risks, as well as the level of adoption of related preventive measures and their impact on financial performance of pension schemes. Regulations for pension scheme enforcement may be influenced by this information.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the financial outcomes and returns concepts. It further discusses the previous empirical studies, knowledge gaps identified and summarizes with a conceptual framework and hypotheses showing the expected relationship among the study variables**.**

2.2 Theoretical Framework

This section discusses ideas that examine the link between fund characteristics and financial performance. Studies in current portfolio theory and other theoretical frameworks incorporate the concepts of agency and trade-offs.

2.2.1 Modern Portfolio Theory

Modern portfolio management (also known as MPT) had its start with Markowitz, who was a pioneer in the field (1952, 1959). In accordance with Stalebrink (2016), who draws on Markowitz's Modern Portfolio Theory, risk-averse investors may create optimum portfolios by assessing the trade-off between market risk and projected returns (MPT). When it comes to risk mitigation, the portfolio theory provides a robust foundation (Njeru, 2014). Based on the work of Stalebrink (2016), multi-asset portfolio theory (MPT) assists in quantifying the advantages of portfolio diversification by offering a universe of risky assets from which an efficient frontier of optimum portfolios may be formed. For every given level of risk, any portfolio on

the efficient frontier provides the highest potential projected return for the least amount of risk. investors who possess an ideal portfolio from the efficient frontier may choose to leverage or de-leverage their portfolio while maintaining holdings in risk-free assets such as government bonds, with the goal of reducing their overall market risk.

MPT provides a comprehensive framework for understanding how institutional portfolios are managed, which has significantly impacted the adoption of passive investment management technologies. When it comes to the Markowitz model, it presupposes that an investor has a pre-determined amount of money to invest. The investor's holding duration, according to Stalebrink (2016), is the maximum amount of time an investment may be kept. As a result, the investor may either reinvest the money back into the stock market, or use it to meet his own personal consumption requirements (or a mixture of both) at the end of that term.

The contemporary portfolio theory shows that companies run their enterprises on a portfolio basis, according to Bodie (2015). As a result, sensible portfolio mix procedures are essential for pension funds in order to achieve control over the multiple portfolios and maximize returns on each portfolio. MPT is significant to the research because diversification of investment fund assets might improve financial performance. Having a working knowledge of MPT may help pension plans in their search for risk-adjusted investment portfolios. In Bodie's view, a portfolio is considered efficient if it provides the greatest return with the least risk. Assumed risk-averse pension schemes punish or require more pay for assets that are more risky. To compensate trustees just for the aggregate market risk, efficient capital markets force them to maximize portfolio diversity, which determines the investment strategy.

According to the findings of this research, MPT is important since it is expected to have an impact on the financial performance of Kenyan pension plans by directing their portfolio mix practices.

2.2.2 Agency Theory

Jensen and Meckling, two American economists, were the first to introduce the notion of agency theory, which was initially articulated in 1976. The philosophy saw companies as contracts between management, shareholders, and creditors. "Agent" and "Principal" were used to describe the roles of management and owners and creditors, respectively, in the company. The link between agents and principals is at the heart of agency theory, which forms the theoretical foundation for corporate governance. Principals in occupational pension schemes are members and sponsoring firms, while agents are scheme administrators.

The principal-agent relationship in pension schemes is complicated by knowledge asymmetry. Investment marketplaces, opportunities, and financing regulations provide managers an advantage over members. Agents may not always match their goals with the goals of the principals in this structure, according to Mutuku (2014). The owners aim to maximize their investment returns, whereas the agents want to increase their personal income. This is called an agency conflict.

It is critical to closely monitor the performance of the agents in order to reduce losses caused by investment mix decisions, risk, and information asymmetry, among other things. The Agency Problem is obvious in organizations because the actions made by Agents (the service providers) on behalf of Principals (the Members) have legal consequences for the former. According to prior research, the financial returns of pension schemes are strongly connected with transaction expenditures (Copeland &

Weston, 2012). In accordance with this theory, the decisions made by the Trustees regarding payments to service providers and contributions, asset allocations, and risk preferences all have an impact on the financial performance of pension plans. As a result, this theory will be heavily relied upon when analyzing the financial performance of pension plans.

2.2.3 Tradeoff Theory

Firms may calculate their ideal cash holding level using the Myers (1984) theory, which compares the benefits of retaining cash with the marginal costs. The firm's ROA will suffer if it makes a significant amount of money in current assets, since doing so will not generate enough profit. The company's primary objective is to maximize earnings while maintaining a positive cash flow at all times. Increases in earnings would be counterproductive if they were achieved by reducing liquidity (Shin & Soenen, 1998).

According to this hypothesis, an imperfect market with a high degree of information asymmetry exists. Theory's capacity to describe an optimal target level of liquidity that minimizes financing costs and maximizes accrued benefits to enterprises is further shown by these findings (Sheikh & Wang, 2011). Static models of liquidity and performance are not adequate for those who argue against the theory, according to critics (Awan & Amin, 2014). There should be no doubt that this theory adds to the risk and return tenet of finance by pointing out that corporations compare the marginal costs and benefits to determine their optimum degree of liquidity.

On a day-to-day basis, the business should decide how many assets it should keep. An aggressive working capital strategy, on the other hand, might be utilized in this scenario to maximize profits at the expense of a greater level of risk in exchange for

fewer risks (Carpenter & Johnson, 1983). Because profitability is inversely related to liquidity, it follows that an increase in liquidity might reduce profitability (Pandey, 2010). A major goal of our research is to comprehend and explain why pension plans must maintain a healthy balance between liquidity and financial performance.

2.3 Determinants of Financial Performance

Pension plans are impacted by a broad variety of circumstances, some of which are internal to the plan and others which are external to it. Internal variables are company-specific and may be controlled by the company itself. They are, portfolio mix, operating costs, liquidity, fund size among others. Factors outside a firm that influence performance include; inflation, GDP, political stability and unemployment rate (Athanasoglou et al., 2005).

2.3.1 Portfolio Mix

Stocks, fixed income, cash equivalents, and real estate are some examples of the many asset types included in a portfolio mix (Njeru, Dominic & Fredrick, 2015). Investors may use asset allocation as a means of developing a portfolio (Oluoch, 2013). It is a strategy that aids investors in selecting an investment portfolio that offers the most potential for profit while also posing the least amount of investment risk (Njuguna, 2012).

There seems to be a favorable correlation between trustees' asset allocations and the financial results generated by their pension schemes. Few studies have looked at the impact of trustees' investment decisions on financial returns, particularly in the context of workplace pension plans, based on empirical evidence, according to the literature (Chirchir, 2007; Nyakundi, 2014).

2.3.2 Operating Costs

The administrative and investment expenses that trustees pay in the operation of occupational pension plans are broken down into two categories. Fund Administrators, Fund managers, and the custodian of the funds are all included in the administrative expenses (Oluoch,2013). The acquisition of money necessitated investment expenditures. This is the responsibility of service providers, which include fund administrators, funds managers, and fund stewards (Nyakundi, 2014).

Other investment costs include the RBA levy, audit fees, actuarial fees, and trustees' compensation. Costs that were supposed to benefit members, not outsiders, accounted for a significant portion of these expenses. High administrative costs have been linked to lower investment returns and lower yearly rates of return for members, according to a study by Mutuku in 2014. In Mutuku's view, the contributions of occupational pension plan members were utilized to cover the expenses of the programs (2014). Efforts must be made to keep operating expenses under control in order for occupational pension plans to succeed.

2.3.3 Liquidity

To determine a corporation's liquidity, we examine any money the company has on hand but are not producing interest. According to Annort, Bernstein, and Hall (1991), institutions must deal with their massive cash reserves. The company's liabilities cannot be compared to the company's cash reserves since the danger of idle cash is larger. It is likely that a decrease in interest rates in the economy would result in a reduction in the interest rate charged by the bank in contrast to the income received from the stock market and from the sale of government securities. A consequence of this might be that the pension fund is unable to satisfy its financial responsibilities.

Because of the very poor profits that may be generated by sitting on cash, it is considered a risky position to be in.

Liquidity, on the other hand, is essential for fund managers to take advantage of market opportunities. There must be a strategy in place to cover the company's short-term obligations in the event of an unexpected event, such as the death of a beneficiary who leaves behind dependants. If funds are to be efficient, they need to avoid hanging on to unused money, which is regarded a waste of resources in modern cash management, according to Hall (2000).

2.3.4 Fund Size

A large scheme is more flexible in terms of investments since it has the ability to make calculated betas during investment, and accommodate more risks compared to smaller ones, hence they can benefit from a high-risk high returns (Kusa & Ongore, 2013). The size of pension funds significantly determines its performance and is given by its contributions, active membership, schemes, and assets (Kigen, 2016).

The RBA categorizes programs based on their asset worth for levy payments (Njoroge, 2014). Michira (2013) claimed that size matters when choosing a retirement plan. The conclusion was that larger schemes perform better than smaller ones owing to economies of scale. This contrasts Bauer (2010) who noted that size of fund has a negative impact on performance.

2.4 Empirical Review

Prior research has proven a correlation between fund characteristics and financial performance; the goals, methodology, and outcomes of these studies are explored in further detail in this section.

2.4.1 Global Studies

Czech investment funds were studied by Hlavac (2016) in an effort to determine the investing techniques used by these funds and how they impact their financial performance. All 76 investment funds in the Czech Republic were included in the analysis. Personal interviews were conducted with 10 investment managers using an interview guide. For the year 2012, secondary data was collected from the annual reports of several investment funds. Descriptive statistics were utilized to categorize them into either an active or a passive investing approach, respectively. The association between ROA and several aspects of investing strategy, including leverage, liquidity, and age and size, was shown to be positive. The findings of a chi square test reveal that organizations with strong liquidity perform better than those that lack or have less liquidity. In contrast to pension plans, the research concentrated on investment funds in Czech.

According to a study published in 2017 by Boon, Briere, and Rigot, regulatory variables and features of pension schemes in the United States, Canada, and the Netherlands have an impact on the distribution of hazardous assets. 600 pension plans from 1992 to 2011 were selected for the research. All of the hazardous assets were classified into three categories: stocks, risky fixed-income, and alternatives. As a proportion of total pension fund assets, each hazardous asset category was assessed. Investment in hazardous assets was impacted by the size and liquidity of pension plans, according to this research There were two factors that had a higher impact on asset allocation than pension plan size and liquidity: the mark-to-market requirement and risk-based capital requirements. There was, however, no evidence of a clear link between the qualities of a pension fund and its financial results.

Studying the financial development of occupational retirement benefits in Australia, Mercer (2018) conducted a research project. An ordinary least squares method was used using 102 benefit schemes as the study's sample. According to the findings, investment strategy, member contributions, and the regulatory environment all had a significant role in the financial expansion of Australian workplace retirement plans. It has been shown that the three criteria have a positive and significant relationship with the financial development of occupational retirement funds. According to the data, the investing approaches used by pension funds have the potential to increase financial efficiency while also generating large returns. According to the conclusions of the research, members' contributions also had a significant impact on the financial growth of retirement benefits. Assets and pensioner payments, according to the results, should be invested more successfully in order to boost returns for retirees. The research, on the other hand, failed to establish how fund characteristics affected pension plan financial performance.

2.4.2 Regional Studies

Pension fund managers' financial viability was examined by Tijjani (2014) in Nigeria. There was a favorable relationship found in the study between a company's age, size, net income, shareholder contribution, and the size of its board of directors. The report advised that PFAs' financial viability should be assured and maintained throughout their lifetimes. The research advised that immediate action be taken to fix any potential weaknesses in the Pension Fund Administrators, and that more attempts to boost contributions should be undertaken. However, the research focused on financial sustainability, which is distinct from financial performance.

An examination of how market volatility, risk management regulations, and robust governance impact the financial returns of registered individual retirement plans in Ghana was conducted by Abels and Guven (2016), according to their work on the topic. They conducted a descriptive survey as part of their investigation. As a starting point, a random sample of 30 distinct pension plans was selected. As a result, the research relied on the census because of the tiny population. The investigation used data from both primary and secondary sources. According to the findings, the financial returns of individual pension plans were strongly influenced by excellent governance. Policy and regulatory foundations for Ghanaian individual pension plans should be improved. An investigation of the influence of operational costs on pension plan financial performance proved unsuccessful.

Sabugo (2017) examined the characteristics that determine the rise of investment income in Tanzania's social security systems. Studying variables that affect Tanzanian social security investment income growth was a primary goal of the study. The research employed a variety of methods, such as secondary aggregate data gathered from 2005/06 to 2016/17. The data collected during the review of documents was subjected to regression analysis in order to be evaluated. According to the findings of this study, the increase in investment income in social security schemes is impacted positively by members' contributions, benefits payments, and the value of social security schemes themselves. According to the findings of the research, social security schemes should broaden their coverage to include the informal sector by increasing member registration, improving benefit packages, and reinvesting members' contributions in more productive ventures in order to boost investment income growth and increase the amount of money saved. Financial performance and investment income growth are vastly different in this study.

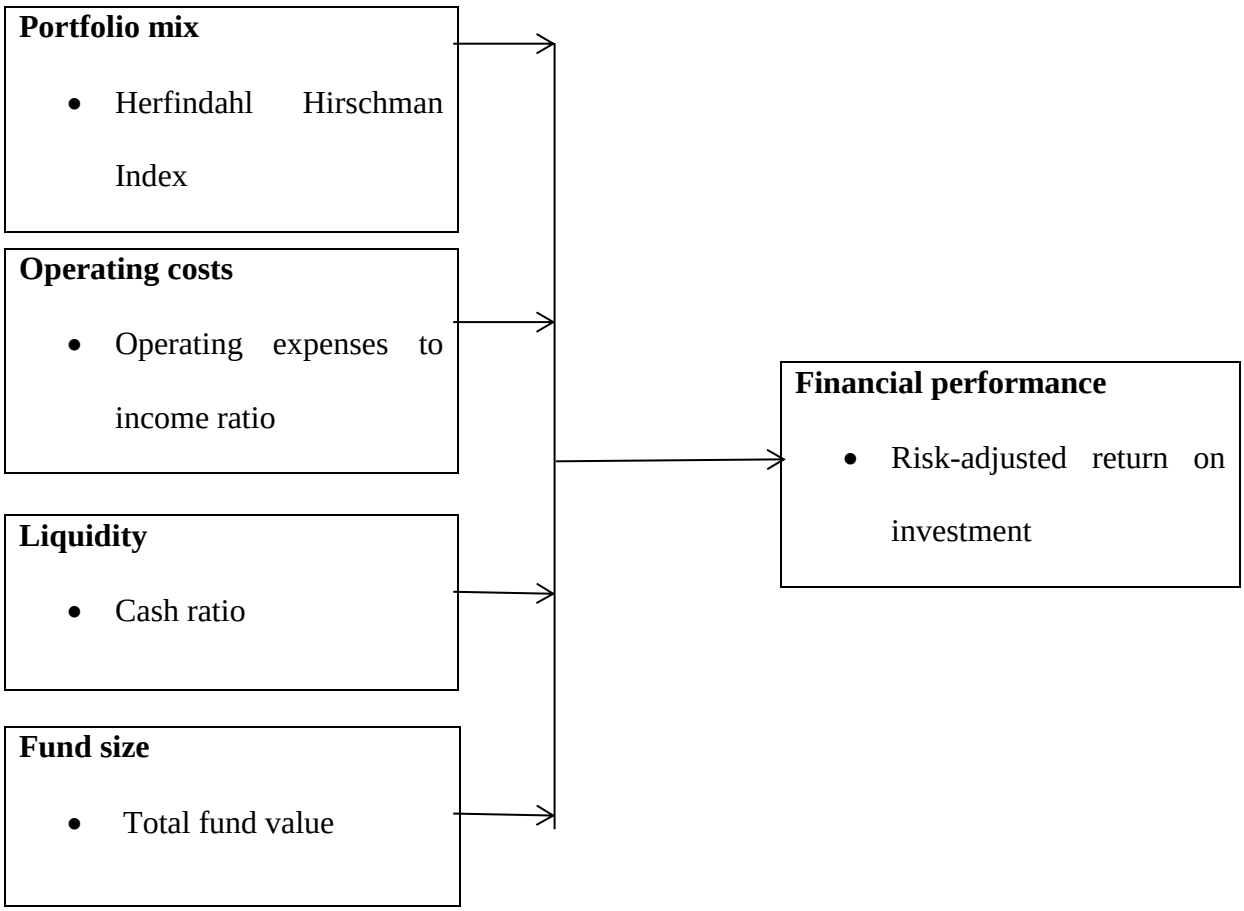
2.4.2 Local Studies

According to Ichingwa and Mbithi (2017), overall contributions to pension schemes in Kenya have a significant impact on their financial performance. According to the Retirement Benefits Authority, Kenya will have 818 occupational pension plans registered by the end of 2016; they were the participants in this research. The 261 registered occupational retirement benefits plans were sampled using a random sampling approach. Statistical methods were employed to examine secondary data, including inferential and descriptive statistics. The research found that overall contributions had a favorable and substantial impact on pension schemes' financial performance. In order to improve financial performance, the researchers proposed that Kenyan pension plans enhance their investments in systems that attract new members and so raise overall contributions. Data from 2016 may not be representative of the company's long-term financial performance.

Pension plan financial performance was the subject of Were, Iravo, and Wanjala's (2017) research. Financial performance was the dependent variable, whereas liquidity, business size, retained profits, and leverage were the independent factors. By the end of 2016, the Retirement Benefits Authority has registered 818 occupational pension schemes in Kenya. A random selection procedure was used to choose 261 pension plans as a representative sample since the population was so diverse. Measures of productivity, liquidity, profitability, and the performance of fixed assets were all analyzed using financial ratios. Liquidity was shown to have a beneficial impact on financial performance, although it was not statistically significant. A one-year research period was used in the study, which may not have been long enough to draw conclusions.

Kenyan registered occupational pension schemes were studied by Namusonge, Sakwa, and Gathogo for their asset mix and financial performance (2017). According to the study, the asset mix of occupational pension plans has a considerable influence on the financial viability of these plans. It has been shown that the independent variable (Asset mix) is responsible for 66.1% of variation in the financial performance of pension plans. A significant addition was made to the study of asset mix and financial performance in Kenyan pension schemes by this research. Other fund characteristics were not examined in the research, which has a conceptual gap.

2.5 Conceptual Framework



Independent variables **Dependent variable**

Figure 2.1: The Conceptual Model

Source: Researcher (2021)

The features of the fund served as the independent variables. As part of a portfolio mix assessment, the Herfindahl Hirschman Index was applied. The total operating expenses to income ratio was used to determine operating costs. The cash ratio was used to calculate liquidity. The entire value of the fund was utilized to calculate the fund's size. To measure financial performance, we used risk-adjusted return on investment as the dependent variable. The conceptual framework model depicted in Fig. 2.1, which depicts the relationships between the variables outlined above, served as a guide for the research.

2.6 Summary of the Literature Review and Research Gaps

Author	Focus of Study	Methodology	Findings	Knowledge Gaps	Focus of current study
Boon et al. (2017)	Pension schemes in the United States, Canada, and the Netherlands include restrictions on the distribution of potentially hazardous assets.	OLS	Investment in hazardous assets was impacted by the size and liquidity of the pension fund.	Financial performance of pension plans was not established as a result of fund features.	A pension scheme's financial performance is affected by its features.
Sabugo (2017)	Factors that contribute to investment income development in Tanzanian social security programs	Descriptive design Regression analysis	Growth of investment income is positively affected by member contributions, benefits payment and value of the schemes	The study did not focus on financial performance	Fund characteristics and financial performance of pension schemes
Ichingwa	Effect of total contribution	Correlation and	Total contribution has a positive	Some fund	Portfolio mix,

and Mbithi (2017)	on the financial performance of pension schemes in Kenya	regression analysis	and significant effect on financial performance	characteristics were left out	liquidity, costs, fund size and performance
Were et al. (2017)	Determinants of financial performance of pension schemes	Ordinary regression analysis	Liquidity had a positive but not statistically significant influence on financial performance	The study considered a short study period of only 1 year	A longer study period of 5 years
Mercer (2018)	Determinants of financial growth of occupational retirement benefits scheme in Australia	Ordinary regression analysis	Investment strategy, members' contribution, and regulatory framework were key determinants of financial growth of occupational retirement schemes in Australia	Portfolio mix, liquidity, costs and fund size were not taken into account	Effect of portfolio mix, liquidity, costs and fund size on financial performance of pension schemes

Source: Researcher (2021)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The study's purpose is to examine how fund characteristics impact Kenyan pension scheme financial performance. The research emphasizes the design, population, data collection and analysis.

3.2 Research Design

Analysis of how fund characteristics and financial performance are linked across Kenyan pension schemes was carried out using a descriptive research design. The researcher's focus on the nature of the occurrences necessitated this design (Khan, 2008). It was also sufficient in defining the interrelationships of the phenomena. This approach also correctly and legitimately depicted the variables, thereby providing adequate answers to research questions (Cooper & Schindler, 2008).

3.3 Population

According to Sekaran and Bougie (2011), a population is the total group of individuals, events, or things studied. A target population is the group to whom the researcher seeks to generalize the study's results. The analysis included all 1340 Kenyan pension schemes. The study was conducted from 2016 to 2020. Table 3.1 shows the population distribution.

Table 3.1 Population Distribution

Classification of pension scheme	Population
Occupational pension schemes	1258
Individual retirement schemes	82
TOTAL	**1340**

Source: RBA (2021)

3.4 Sample Size and Sampling Technique

Sampling is defined as choosing units from a population. Sampling technique is the method that is used to select the sample (Creswell & Creswell, 2017). Stratified random sampling was utilized in this study because it enables the researcher to split the sample into mutually exclusive groups of participants. An occupational pension plan and an individual retirement plan were the two main types of retirement plans available to the people. Cooper and Schindler (2014) claimed that the strategy requires dividing the study population into separate sub groups and generating a simple random sample for each sub group.

The study adopted Yamane (1967) formula with assumption of 90% of confidence level to estimate the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = sample size

N = population size

e = the level of precision

1 = Constant

$$n = 1340/\ 1+ 1340(0.1)^2$$

$$= 93.05 \approx 93 \text{ pension schemes}$$

The sample size for the present research was 93 pension plans after substituting these values into the aforementioned equation. Table 3.2 displays the final sample size.

Table 3.2: Sample Size

Classification of Scheme	Population	Sample Size
Occupational pension schemes	1258	87
Individual retirement schemes	82	6
TOTAL	**1340**	**93**

Source: RBA (2021)

3.5 Data Collection

This research relied on data that had already been collected. In order to obtain the data, a secondary data collecting schedule was used that spanned five years (Appendix I). Every year, RBA requires all registered pension schemes to disclose their financial reports publicly. Secondary data was collected for each variable; portfolio mix, operating costs, liquidity, fund size and financial performance. The researcher gathered data for each aspect from the 93 chosen pension schemes' financial reports between 2016 and 2020.

3.6 Data Analysis

The data were analyzed using SPSS version 24. The findings were presented in tables and graphs. Descriptive statistics were used for central trend computation, dispersion measurements and standard deviation for each variable. Correlation and regression were the basis of inferential statistics. Regression between variables is shown by a correlation indicating how closely the variables are linked. A multivariate regression revealed the dependent and independent variables' linear relationship.

3.6.1 Diagnostic Tests

Testing for normality, stationarity, multicolinearity, homogeneous and autocorrelation was performed to assess model feasibility. The assumption of normalcy stated that the dependent variable's residual was normally distributed and towards the mean. This was done using the Shapiro-Wilk or Kolmogorov-Smirnov tests. If a variable had no normal distribution, it was adjusted using the logarithmic adjustment methodology.

Stationarity test was utilized in determining if the statistical properties such as variance, mean, as well as autocorrelation change with the passage of time. The enhanced Dickey Fuller test was used to determine this attribute. It was decided to use robust standard errors if the data did not match this requirement (Khan, 2008).

Autocorrelation is a measure of how similar one time series is when compared to its lagged value across successive timings. The Wooldridge test was performed to determine the outcome, and the robust standard errors were incorporated in the model if the assumption was broken. An almost perfect linear connection between many independent variables is called multicollinearity. This research uses Variance Inflation Factors (VIF) and tolerance levels. A new measurement was used in place of any multicolinear variables. If the variance errors in a regression are distributed among the independent variables, heteroskedasticity confirms this. This was tested using the Breuch Pagan test and if data does not meet the homogeneity of variances assumption, robust standard errors were employed (Burns & Burns, 2008).

3.6.2 Analytical Model

The following equation was applicable:

$$Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4X_4 +\varepsilon$$

Where: Y = Financial performance on pension scheme measured by risk-adjusted ROI as per the Sharpe Ratio

β_0 =y regression equation intercept.

β_1, β_2, β_3, β_4=are coefficient of regression

X_1 = Portfolio mix as measured by the Herfindahl Hirschman Index

X_2 = Liquidity as given by the cash ratio

X_3 = Fund size measured as the natural logarithm of total fund value

X_4 = Operating costs as assessed via the ratio of total operating expenses to income

ε =error term

3.6.3 Tests of Significance

Parametric tests were employed to assess the overall model and individual variables. The ANOVA approach established the model's relevance, and the F-test determined each variable's significance.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter's goal was to analyze the data gathered in order to determine the influence of fund characteristics on the performance of Kenya's pension schemes. Results were presented in tables using a variety of methods, including regression analysis and correlation analysis.

4.2 Descriptive Analysis

The standard deviation, the average, and the highest and lowest values of the variables are all presented in this study. The outcome for the chosen research variables are demonstrated in Table 4.1. For all of the pension schemes in Kenya whose data was available for the research, SPSS was used to examine the variables across a five-year period (2016 to 2020). The following table shows the descriptive statistics for the study's variables.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ROI	430	.002	.365	.11252	.086495	.989	.118	.178	.430
Portfolio Mix	430	.571	1.000	.88660	.078990	-1.443	.118	3.660	.430
Liquidity	430	.007	3.296	1.09529	.550098	1.039	.118	1.660	.430
Fund size	430	6.072	8.730	7.77254	.575464	-.237	.118	-1.034	.430
Operating costs	430	.025	1.419	.48120	.246427	.828	.118	.971	.430
Valid N (listwise)	430								

Source: Research Findings (2021)

4.3 Diagnostic Tests

Before building the regression model, many diagnostic tests were performed. Stationarity testing, autocorrelation, multivariate collinearity, multivariate normality, heteroskedasticity and normality testing are among the diagnostic procedures utilized in this study.

4.3.1 Multicollinearity Test

Multicollinearity is a statistical phenomenon that occurs when a number of predictor variables are highly connected. In studies when there are strong correlations between

independent variables, the effects on the dependent variable are exaggerated. There is a perfect multicollinearity when a number of variables have multiple linear relationships.

Table 4.2: Multicollinearity Test for Tolerance and VIF

	Collinearity Statistics	
Variable	**Tolerance**	**VIF**
Portfolio mix	0.503	1.988
Operating costs	0.310	3.226
Fund size	0.380	2.632
Liquidity	0.706	1.416

Source: Research Findings (2021)

The data was subjected to a Multicollinearity test. The VIF values were combined with the variable's Tolerance. Multicollinearity occurs when the tolerance value is more than 0.2 and the VIF is less than 10. Tolerance values over 0.2 and VIF values below 10 suggested that there was no multicollinearity.

4.3.2 Normality Test

In order to establish normality, Kolmogorov-Smirnov and Shapiro-Wilk tests were used. The list of alternative hypotheses and null hypotheses is below.

H_0: the secondary data was not normally distributed.

H_1 the secondary data was normally distributed

According to this definition, the null hypothesis should be rejected when the P-value is more than 0.05 and accepted when the P-value is less than 0.05; There is a summary of the findings in table 4.3 below.

Table 4.3: Normality Test

	Kolmogorov-Smirnov[a]	Shapiro-Wilk

	Statistic	Df	Sig.	Statistic	Df	Sig.
Performance	.161	430	.300	.869	430	.853
Portfolio mix	.173	430	.300	.918	430	.822
Liquidity	.178	430	.300	.881	430	.723
Fund size	.175	430	.300	.874	430	.812
Operating costs	.176	430	.300	.892	430	.784

a. Lilliefors Significance Correction

Source: Research Findings (2021)

The p-value was larger than 0.05, indicating that the null hypothesis was not supported and that the data were thus regularly distributed. This data may now be analyzed using ANOVA, Pearson's correlation, and regression analysis.

4.3.3 Heteroskedasticity Test

Cross-sectional units tend to exhibit homoscedastic error processes; however, unit-specific variances are more common and are referred to as group-wise heteroskedasticity. Residuals are used to compute Breuch Pagan group-wise heteroskedasticity when the command with the highest weight is used. Null hypothesis states tha σ2i =σ2 for i =1t...Ng, where Ng is the number of cross-sectional units.

Table 4.4: Heteroskedasticity Test

Modified Wald test for group wise heteroskedasticity
H0: sigma(i)^2 = sigma^2 for all i
chi2 (430) = 320.28
Prob>chi2 = 0.1125

Source: Research Findings (2021)

The calculated p-value indicates that the null hypothesis of Homoscedastic error terms was not rejected since the p value was greater than 0.05 at 0.1125.

4.3.4 Autocorrelation Test

The researcher was concerned that the introduction of serial correlation into their model would cause inaccurate results and carried a test to detect this kind of serial correlation, the Breusch-Godfrey autocorrelation test was utilized.

Table 4.5: Test of Autocorrelation

Wooldridge test for autocorrelation in panel data **H0: no first-order autocorrelation**
F(1, 429) = 0.324 Prob> F = 0.5719

Source: Research Findings (2021)

Table 4.5 shows that the null hypothesis of no serial link is not rejected since the p-value of 0.5719 is higher than 0.05.

4.3.5 Stationarity Test

Table 4.6 displays the results of the Levin-Lin Chu unit root test. All variables had p-values less than 0.05, hence all unit root panels were removed. Panel data for all variables became stagnant as a result of this.

Table 4.6: Levin-Lin Chu unit-root test

Levin-Lin Chu unit-root test			
Variable	**Hypothesis**	**p value**	**Verdict**
Performance	Ho: Panels contain unit roots	0.0000	Reject Ho
Portfolio mix	Ho: Panels contain unit roots	0.0000	Reject Ho
Liquidity	Ho: Panels contain unit roots	0.0000	Reject Ho
Fund size	Ho: Panels contain unit roots	0.0000	Reject Ho
Operating costs	Ho: Panels contain unit roots	0.0000	Reject Ho

Source: Research Findings (2021)

4.4 Correlation Results

For each predictor variable, correlation analysis was performed to determine the degree and direction of the correlation with the response variable. Table 4.7 shows the size and direction of the correlations between the research variables.

Table 4.7: Correlation Results

		ROI	Portfolio mix	Liquidity	Fund size	Operating costs
ROI	Pearson Correlation	1				
	Sig. (2-tailed)					
Portfolio mix	Pearson Correlation	.442**	1			
	Sig. (2-tailed)	.000				
Liquidity	Pearson Correlation	.165*	.217**	1		
	Sig. (2-tailed)	.018	.004			
Fund size	Pearson Correlation	.252**	.038	.298**	1	
	Sig. (2-tailed)	.000	.565	.000		
Operating costs	Pearson Correlation	.017	.162*	.195**	.001	1
	Sig. (2-tailed)	.844	.020	.007	.983	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=430

Source: Research Findings (2021)

Table 4.7 shows a positive and substantial correlation between portfolio composition and performance (r=0.442) at a 5% level of significance. At the 5% significance level, data demonstrate that liquidity (r=0.165) is positively and substantially linked to performance. At the 5% level of significance, data suggest that fund size and performance have a positive and significant correlation (r=0.252). Finally, there was a positive correlation between operating expenses and performance, although the correlation was not statistically significant.

4.5 Regression Results

Regression analysis was used to determine how much of a role the specified factors have in a person's performance. Table 4.8 to 4.10 show the regression findings.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577[a]	.333	.324	.4964932

a. Predictors: (Constant), Operating costs, Fund size , Portfolio mix, Liquidity

Source: Research Findings (2021)

The independent factors analyzed explained 33.3 % of the differences in performance across Kenyan pension schemes, according to the results of the adjusted R^2. Consequently, this suggests that the four variables contributed only 33.3 % of the difference in performance across Kenyan pension plans, whereas other factors that were not addressed in this study contributed 66.7 %.

Table 4.9: ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.512	4	.128	20.155	.000[b]
	Residual	2.698	425	.006		
	Total	3.210	429			

a. Dependent Variable: ROI

b. Predictors: (Constant), Operating costs, Fund size, Liquidity, Portfolio Mix

Source: Research Findings (2021)

Table 4.9 ANOVA results reveal that the data had a 0.000 significance level, which suggests that the data is appropriate for drawing inferences about the variables.

Table 4.10: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.248	.062		-7.184	.000
	Portfolio mix	.118	.018	.337	6.692	.000
	Liquidity	.003	.004	.044	.736	.463
	Fund size	.033	.012	.158	2.700	.007
	Operating costs	.001	.004	.007	.120	.905
a. Dependent Variable: ROI						

Source: Research Findings (2021)

The coefficient of regression model was as below;

$$\mathbf{Y = -0.248 + 0.118X_1 + 0.033X_2}$$

Where:

Y = Performance; X_1 = Portfolio mix; X_2= Fund size

4.6 Discussion of Research Findings

The purpose of this study was to evaluate how the fund features of Kenyan pension plans impact their performance. Descriptive design was used while the population was the 1340 Kenyan pension plans. The Yamane formula yielded a sample size of 93. A response percentage of 92.5 percent from 86 of the pension plans was declared acceptable. Secondary data from RBA bulletins and annual reports of individual schemes were used in the study. The fund's size, asset mix, liquidity, and operational expenses were all considered separate factors. Descriptive and inferential statistics were used in the analysis. The results are the topic of this section.

According to a correlation analysis, the effectiveness of Kenyan pension plans is highly tied to the makeup of their portfolios. Researchers found that profitability and liquidity are closely linked, with an increasing profitability leading to an increase in

liquidity. An relationship between fund size and performance emerged, showing that better-performing pension plans tend to have bigger pots of money. There was a positive correlation between operational expenses and performance but the correlation was not statistically significant.

It was shown that 33.3% of the variance in performance of Kenya's pension schemes may be attributed to the four factors included in the regression. Because the P-value was less than 0.05, the study's findings had significant predictive potential (0.000). This indicates that the model was able to accurately represent the connection between the study variables. In terms of individual performance, portfolio mix and fund size are both important factors. The results showed that liquidity and operational expenses had a beneficial impact on performance, although the effect was not statistically significant.

According to the findings of Namusonge, Sakwa, and Gathogo (2017), asset mix has a significant impact on the financial performance of Kenya's registered occupational pension schemes. Occupational pension plans' financial performance is greatly improved by their asset mix, according to a new research. This variable (Asset mix) accounted for 66.1% of the variance in financial performance across pension plans studied, according to research results. An significant addition was made to the study of asset mix and financial performance in Kenyan pension schemes by this research.

It is also consistent with the results of Were, Iravo, and Wanjala (2017), who focused on the financial performance of pension schemes. We found that a firm's financial performance was strongly influenced by liquidity, company size, retained earnings, and leverage. By the end of 2016, the Retirement Benefits Authority has received registrations for 818 occupational pension plans in Kenya. A random sampling

approach was employed to choose a sample size of 261 pension plans due to the diversity of the population. Measures of productivity, liquidity, profitability, and the performance of fixed assets were all taken into consideration by the financial ratios. Although liquidity had a beneficial impact on financial performance, it was not statistically significant.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings of the preceding chapter, and it also identifies the study's shortcomings. The study also offers policymakers with recommendations and suggests topics for additional research.

5.2 Summary of Findings

This research sought to find out how fund characteristics impact Kenyan pension plans. Selecting criteria were portfolio mix, liquidity, fund size, and running expenses. It was decided to finish the study using a descriptive research approach. RBA reports and the annual reports of individual pension plans were used to collect secondary data, which SPSS analyzed. For the five-year period from 2016 to 2020, 86 schemes' annual data was gathered.

The initial purpose was to assess the influence of portfolio mix on Kenyan pension scheme performance. At a 5% significance level, the correlation data reveal that portfolio mix has a positive connection with performance. Furthermore, the correlation was statistically significant. It is clear from the regression findings (β=0.118, p=0.000) that the portfolio mix had a positive and substantial influence on pension plan performance in Kenya.

The second goal was to study the influence of liquidity on the performance of Kenyan pension schemes. Liquidity and performance have a favorable and statistically significant relationship, according to research conducted at a 5% significance level. Kenyan pension schemes' performance was boosted by liquidity, although the impact was not statistically significant (β=0.003, p=0.463).

The third goal was to assess the influence of fund size on Kenyan pension scheme performance. Correlation statistics at the 5% significance level demonstrate a favorable association between fund size and performance. Regression analysis revealed a statistically significant association between pension fund size and performance in Kenya (β=0.033, p=0.007).

The study's fourth objective was to examine how operational expenditures affect Kenyan pension plan performance. A 5% significance threshold indicated a favorable but not significant relationship between operational expenditures and performance. It was observed that operating expenditures had a favorable but non-significant influence on performance across Kenyan pension schemes (β=0.001, p=0.905).

5.3 Conclusions

The research intended to relate fund characteristics to Kenyan pension plan performance. Portfolio mix has a significant influence on performance. This indicates

that pension plans with high levels of diversity will outperform those with low levels of diversification.

The study discovered a strong link between liquidity and performance, indicating that more liquid pension schemes perform better. Liquidity means the capacity to take advantage of short term investment opportunities when they come and also the ability to pay recurring commitments when they are due.

The research found a favorable and substantial influence of fund size on performance. This may indicate that larger pension funds will perform better than smaller pension funds. Larger pension funds may negotiate better investment agreements, leading to greater performance.

Moreover, the data showed that operational expenses had no substantial influence on performance. This implies that pension schemes with higher operating costs do not always report lower or higher performance compared to pension schemes with low operating costs. This is because reducing operational expenses does not necessarily boost efficiency in providing services and making investment choices.

Mercer (2018) found similar financial increase in occupational retirement benefit systems in Australia. The research population consisted of 102 benefit programs. Australia's occupational retirement systems grew financially due to investment strategy, member contributions, and legislative structure. A favorable and substantial link between the three factors was identified. The analysis showed that the plans' investment methods may improve financial efficiency and create significant returns for the pension fund.

5.4 Recommendations for Policy and Practice

The study suggests that diversifying one's portfolio may assist increase performance. Therefore, the research proposes that policymakers among Kenya's pension plans develop rules that boost diversification into the many asset classes accessible, since this would result in an improvement of the performance of pension schemes in the long run. Pension schemes board members should also advocate for an increase in portfolio mix to enhance the return on investment.

Furthermore, it was shown that liquidity had a favorable link with performance. Therefore, the report suggests that Kenyan pension plans try to have more liquidity, since this will assist them in satisfying their maturing liabilities as they emerge and also enable them to take advantage of any short-term investment opportunities that may become available in the future.

According to the results of the research, the size of the fund had a statistically significant favorable impact on performance. As a result, the report suggests that the heads of pension funds establish policies focused at growing the amount of their funds' assets. This can be done by coming up with effective marketing strategies that will bring more members on boards. Members' contributions can also be increased and this will also contribute to an increase in the fund size.

5.5 Limitations of the Study

The debate focused on some of the aspects that are thought to influence the performance of Kenya's pension schemes. There were four explanatory factors in particular that were examined in this research. In addition to these factors, there are a number of other factors that might affect the performance of pension programs. Some are within the control of the plan, such as management quality, while others are out of

the control of management, such as the unemployment rate and political instability, and are thus difficult to regulate.

The investigation made use of quantitative secondary data. In addition, qualitative data that might explain additional variables that impact the link between portfolio mix, liquidity, and pension plan performance were not taken into consideration in the research. Qualitative approaches such as focus groups, open-ended surveys, and interviews may assist in the production of more specific results.

The study lasted five years (2016 to 2020). It is uncertain whether the effects will last long. Also unknown is whether or not comparable outcomes will be reached beyond 2020. For the research to be comprehensive, it should have been done over a longer period of time to account for major economic developments.

The researcher examined the data using an OLS regression model. There were many drawbacks to applying regression models, including the possibility of erroneous and misleading results, which may cause the value of a variable to vary, which made it impossible to accurately generalize the findings of the study. Additional specifically, if more data were included in the regression, the outcome may be significantly different. As a result, the model that was adopted had additional drawback.

5.6 Suggestions for Further Research

The study's data had a R square of 33.3%. The study's results show that additional factors impact the performance of Kenyan pension schemes that were not considered. Other researches ought thus to focus on other factors for example; management quality, corruption, contribution, inflation rate, political stability among other factors that affect performance among pension schemes.

The study was limited to pension schemes in Kenya. Additional research can be carried on a comparative study of pension schemes in Kenya with other countries. Future research should look into how fund characteristics affects other factors besides the performance, such as growth, efficiency, development, stability among others.

Because of the readily available data, the focus of this research was drawn to the last five years. Future studies may span a longer time period, such as ten or twenty years, and might have a significant impact on this study by either complementing or contradicting its conclusions. A longer study allows the researcher to catch the influence of business cycles such as booms and busts.

A regression model, which depended on a variable being changed, had its own set of restrictions. Methods like the Vector Error Correction Model (VECM) may help investigate the many relationships between fund attributes and performance.

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APPENDICES

Appendix I: Research Data

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
1	2016	0.083	0.900	0.513	0.753	8.216
1	2017	0.114	0.909	0.456	0.779	8.218
1	2018	0.147	0.909	0.676	0.900	8.251
1	2019	0.195	0.857	0.745	1.219	8.269
1	2020	0.174	0.909	0.723	0.781	8.317
2	2016	0.241	0.938	0.274	1.535	8.338
2	2017	0.159	0.917	0.325	1.254	8.424
2	2018	0.064	0.900	0.289	1.855	8.414
2	2019	0.060	0.909	0.295	1.632	8.456
2	2020	0.031	0.875	0.275	3.296	8.486
3	2016	0.028	0.875	0.643	0.621	8.207
3	2017	0.025	0.857	0.666	0.612	8.288
3	2018	0.014	0.909	0.664	1.114	8.377
3	2019	0.002	0.909	0.653	1.036	8.425
3	2020	0.105	0.875	0.637	1.537	8.452
4	2016	0.084	1.000	0.116	1.493	7.558
4	2017	0.133	0.909	0.132	1.101	7.620
4	2018	0.171	0.889	0.166	0.751	7.588
4	2019	0.057	1.000	0.147	0.879	7.565
4	2020	0.123	0.933	0.127	1.135	7.541
5	2016	0.089	0.889	0.701	0.590	8.058
5	2017	0.094	0.917	0.691	0.620	8.124
5	2018	0.099	1.000	0.702	0.599	8.166
5	2019	0.100	1.000	0.650	0.708	8.229
5	2020	0.151	0.889	0.538	0.524	8.329
6	2016	0.061	0.875	0.733	1.824	8.577
6	2017	0.297	1.000	0.661	1.577	8.628
6	2018	0.232	0.857	0.595	1.112	8.651
6	2019	0.230	0.875	0.608	1.275	8.699
6	2020	0.166	0.917	0.550	1.344	8.730
7	2016	0.011	0.875	0.383	0.983	8.002
7	2017	0.057	0.917	0.355	1.062	8.051
7	2018	0.013	1.000	0.403	1.740	8.049
7	2019	0.091	0.909	0.573	1.201	8.143
7	2020	0.019	0.909	0.561	0.941	8.160
8	2016	0.186	0.875	0.289	1.321	7.982

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
8	2017	0.095	0.909	0.551	0.760	8.026
8	2018	0.153	0.875	0.431	0.688	8.077
8	2019	0.107	0.875	0.765	0.992	8.189
8	2020	0.010	0.833	0.580	1.070	8.282
9	2016	0.018	0.857	0.248	0.268	8.020
9	2017	0.004	0.889	0.241	0.349	8.044
9	2018	0.142	0.889	0.358	0.332	7.973
9	2019	0.155	0.917	0.228	0.266	7.974
9	2020	0.168	0.933	0.221	0.312	7.995
10	2016	0.030	0.875	0.514	1.118	8.188
10	2017	0.038	1.000	0.530	1.110	8.236
10	2018	0.042	1.000	0.587	0.990	8.271
10	2019	0.028	0.917	0.693	0.850	8.329
10	2020	0.057	0.923	0.607	1.061	8.351
11	2016	0.040	0.875	0.535	0.853	8.390
11	2017	0.042	0.909	0.592	0.936	8.480
11	2018	0.230	0.909	0.508	0.141	8.528
11	2019	0.214	0.875	0.693	0.104	8.572
11	2020	0.161	1.000	0.763	1.153	8.626
12	2016	0.144	0.875	0.795	0.262	7.206
12	2017	0.122	0.889	0.785	0.223	7.199
12	2018	0.096	0.889	0.697	0.248	7.224
12	2019	0.279	0.938	0.668	0.287	7.319
12	2020	0.279	0.909	0.683	0.280	7.355
13	2016	0.110	0.889	1.307	0.853	7.723
13	2017	0.059	0.889	1.229	0.936	7.677
13	2018	0.244	1.000	1.033	1.153	7.537
13	2019	0.124	1.000	0.810	0.599	7.499
13	2020	0.126	1.000	0.746	0.833	7.479
14	2016	0.117	1.000	0.156	0.912	7.687
14	2017	0.087	0.889	0.174	1.041	7.724
14	2018	0.085	0.889	0.336	0.697	7.561
14	2019	0.077	0.909	0.322	1.042	7.625
14	2020	0.062	1.000	0.377	0.905	7.619
15	2016	0.067	1.000	0.393	0.593	8.216
15	2017	0.052	0.818	0.444	1.153	8.218
15	2018	0.023	0.889	0.384	0.694	8.251
15	2019	0.023	0.935	0.328	0.715	8.269
15	2020	0.284	0.571	0.270	0.576	8.317
16	2016	0.002	0.909	0.142	1.174	7.392

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
16	2017	0.034	0.923	0.104	0.983	7.391
16	2018	0.140	0.923	0.090	1.327	7.427
16	2019	0.082	0.714	0.188	1.191	7.495
16	2020	0.306	0.938	0.295	1.296	7.609
17	2016	0.169	0.941	0.582	2.606	7.709
17	2017	0.292	0.875	0.529	1.987	7.793
17	2018	0.214	0.889	0.569	1.757	7.796
17	2019	0.004	0.857	0.462	1.574	7.809
17	2020	0.004	0.714	0.507	1.555	7.739
18	2016	0.118	0.571	0.437	1.307	8.142
18	2017	0.262	0.899	0.465	1.222	8.216
18	2018	0.103	0.909	0.486	2.680	8.248
18	2019	0.134	0.944	0.495	2.262	8.287
18	2020	0.092	0.833	0.615	0.631	8.293
19	2016	0.005	0.900	1.006	1.251	7.027
19	2017	0.053	1.000	0.797	1.057	7.000
19	2018	0.054	0.909	0.966	1.244	6.977
19	2019	0.074	0.944	0.366	0.942	6.937
19	2020	0.020	0.571	0.446	1.048	6.934
20	2016	0.048	0.714	1.419	1.013	6.858
20	2017	0.088	1.000	0.867	1.156	6.861
20	2018	0.124	0.917	0.520	1.596	6.961
20	2019	0.018	0.917	0.475	1.315	7.039
20	2020	0.018	0.909	0.466	1.081	7.118
21	2016	0.161	0.938	0.381	1.153	8.338
21	2017	0.107	0.923	0.383	0.784	8.424
21	2018	0.005	0.923	0.394	1.019	8.414
21	2019	0.023	0.929	0.471	0.853	8.456
21	2020	0.040	0.818	0.279	0.936	8.486
22	2016	0.040	0.923	0.285	1.116	8.338
22	2017	0.042	0.571	0.295	0.007	8.424
22	2018	0.119	0.714	0.266	1.299	6.761
22	2019	0.047	0.818	0.280	1.110	6.794
22	2020	0.066	0.900	0.277	0.801	8.288
23	2016	0.111	0.929	0.240	0.987	8.207
23	2017	0.080	0.938	0.261	0.748	8.288
23	2018	0.047	0.818	0.240	0.757	8.377
23	2019	0.076	0.818	0.216	0.702	8.425
23	2020	0.228	0.818	0.820	0.698	8.452
24	2016	0.221	0.875	0.888	0.677	8.486

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
24	2017	0.365	0.727	0.801	0.992	8.338
24	2018	0.056	0.889	0.855	0.856	8.424
24	2019	0.017	0.889	0.868	0.321	6.072
24	2020	0.124	0.900	0.078	1.153	6.505
25	2016	0.115	0.889	0.091	2.576	7.511
25	2017	0.136	0.818	0.148	2.284	7.538
25	2018	0.040	0.900	0.191	0.254	7.508
25	2019	0.020	1.000	0.239	0.226	7.640
25	2020	0.011	0.714	0.265	0.206	7.651
26	2016	0.287	0.875	0.221	0.853	8.390
26	2017	0.027	0.857	0.229	0.936	8.480
26	2018	0.004	0.938	0.253	0.753	8.528
26	2019	0.160	0.917	0.303	2.074	8.572
26	2020	0.160	0.818	0.294	0.853	8.626
27	2016	0.197	0.800	0.280	1.327	7.673
27	2017	0.263	0.867	0.284	1.191	7.797
27	2018	0.032	0.889	0.382	1.296	7.617
27	2019	0.071	0.875	0.283	2.606	7.675
27	2020	0.104	0.818	0.271	1.987	7.686
28	2016	0.100	0.889	0.267	1.757	7.125
28	2017	0.077	0.818	0.236	1.153	7.092
28	2018	0.072	0.857	0.241	1.146	7.102
28	2019	0.075	0.917	1.139	1.306	7.169
28	2020	0.037	0.938	0.939	1.568	7.165
29	2016	0.064	1.000	0.728	1.642	7.469
29	2017	0.028	1.000	0.673	1.486	7.421
29	2018	0.088	0.875	0.587	0.912	7.434
29	2019	0.033	0.899	0.476	0.796	7.441
29	2020	0.033	0.714	0.437	0.619	7.458
30	2016	0.228	0.938	0.388	1.049	7.102
30	2017	0.327	0.909	0.347	0.796	7.097
30	2018	0.223	0.889	0.346	0.650	7.090
30	2019	0.221	0.917	0.348	0.685	7.118
30	2020	0.228	0.900	0.347	0.827	7.125
31	2016	0.218	1.000	0.310	0.621	7.198
31	2017	0.272	1.000	0.357	1.249	7.279
31	2018	0.284	0.889	0.369	0.998	7.338
31	2019	0.246	0.714	0.683	1.424	7.416
31	2020	0.269	0.899	0.679	1.520	7.426
32	2016	0.319	0.917	0.594	0.553	6.505

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
32	2017	0.328	0.933	0.763	0.735	7.511
32	2018	0.313	1.000	0.754	0.548	7.538
32	2019	0.060	1.000	1.087	0.832	7.508
32	2020	0.064	0.750	1.053	1.234	7.640
33	2016	0.038	0.899	1.011	0.853	7.651
33	2017	0.041	0.714	0.906	0.936	8.390
33	2018	0.105	0.917	0.889	0.704	8.480
33	2019	0.125	0.917	0.530	1.576	8.528
33	2020	0.120	0.833	0.526	1.539	8.572
34	2016	0.236	0.938	0.537	2.212	8.626
34	2017	0.187	0.875	0.452	2.227	7.673
34	2018	0.160	0.889	0.403	2.267	7.797
34	2019	0.125	0.900	0.046	3.011	7.617
34	2020	0.137	0.833	0.075	1.263	7.675
35	2016	0.066	0.867	0.075	1.153	7.686
35	2017	0.076	0.875	0.084	1.068	7.125
35	2018	0.072	0.944	0.364	0.722	7.092
35	2019	0.080	0.750	0.560	0.520	7.102
35	2020	0.080	1.000	0.524	1.152	7.169
36	2016	0.087	0.889	0.526	0.998	7.165
36	2017	0.094	0.833	0.555	0.828	7.469
36	2018	0.022	0.889	0.025	0.831	7.421
36	2019	0.096	0.909	0.718	0.625	7.434
36	2020	0.056	0.714	0.710	0.904	7.441
37	2016	0.081	0.900	0.636	0.695	7.458
37	2017	0.091	0.867	0.567	0.759	7.102
37	2018	0.051	0.750	0.491	1.151	7.097
37	2019	0.074	0.909	0.492	0.499	7.090
37	2020	0.058	0.900	0.448	0.616	7.118
38	2016	0.065	0.909	0.423	0.918	7.125
38	2017	0.054	0.889	0.437	1.343	7.198
38	2018	0.047	0.800	0.486	1.610	7.279
38	2019	0.014	0.900	0.392	1.804	7.338
38	2020	0.014	1.000	0.280	1.646	7.416
39	2016	0.348	0.941	0.530	1.357	7.426
39	2017	0.254	0.900	0.468	0.588	8.216
39	2018	0.083	0.818	0.450	1.054	8.248
39	2019	0.085	0.900	0.442	1.592	8.287
39	2020	0.099	0.889	0.341	2.182	8.293
40	2016	0.221	0.833	0.283	1.610	7.027

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
40	2017	0.365	0.833	0.400	1.804	7.000
40	2018	0.056	0.750	0.318	0.853	6.977
40	2019	0.017	0.944	0.399	0.936	6.937
40	2020	0.124	0.899	0.400	1.111	6.934
41	2016	0.091	0.800	0.335	1.424	6.858
41	2017	0.138	0.889	0.326	1.520	6.861
41	2018	0.111	0.800	0.338	0.553	6.961
41	2019	0.078	0.800	0.376	0.735	7.039
41	2020	0.067	0.899	0.337	0.548	7.118
42	2016	0.066	0.889	0.460	0.832	8.338
42	2017	0.066	0.800	0.679	1.234	8.424
42	2018	0.067	0.909	0.414	0.853	8.414
42	2019	0.055	0.833	0.737	0.936	8.456
42	2020	0.055	0.909	0.546	0.704	8.486
43	2016	0.042	0.909	0.390	1.576	8.338
43	2017	0.294	0.909	0.440	1.539	8.424
43	2018	0.113	0.889	0.420	2.212	6.761
43	2019	0.188	1.000	0.380	2.227	6.794
43	2020	0.205	0.933	0.230	2.267	8.288
44	2016	0.083	0.900	0.513	0.753	8.216
44	2017	0.114	0.909	0.456	0.779	8.218
44	2018	0.147	0.909	0.676	0.900	8.251
44	2019	0.195	0.857	0.745	1.219	8.269
44	2020	0.174	0.909	0.723	0.781	8.317
45	2016	0.241	0.938	0.274	1.535	8.338
45	2017	0.159	0.917	0.325	1.254	8.424
45	2018	0.064	0.900	0.289	1.855	8.414
45	2019	0.060	0.909	0.295	1.632	8.456
45	2020	0.031	0.875	0.275	3.296	8.486
46	2016	0.028	0.875	0.643	0.621	8.207
46	2017	0.025	0.857	0.666	0.612	8.288
46	2018	0.014	0.909	0.664	1.114	8.377
46	2019	0.002	0.909	0.653	1.036	8.425
46	2020	0.105	0.875	0.637	1.537	8.452
47	2016	0.084	1.000	0.116	1.493	7.558
47	2017	0.133	0.909	0.132	1.101	7.620
47	2018	0.171	0.889	0.166	0.751	7.588
47	2019	0.057	1.000	0.147	0.879	7.565
47	2020	0.123	0.933	0.127	1.135	7.541
48	2016	0.089	0.889	0.701	0.590	8.058

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
48	2017	0.094	0.917	0.691	0.620	8.124
48	2018	0.099	1.000	0.702	0.599	8.166
48	2019	0.100	1.000	0.650	0.708	8.229
48	2020	0.151	0.889	0.538	0.524	8.329
49	2016	0.061	0.875	0.733	1.824	8.577
49	2017	0.297	1.000	0.661	1.577	8.628
49	2018	0.232	0.857	0.595	1.112	8.651
49	2019	0.230	0.875	0.608	1.275	8.699
49	2020	0.166	0.917	0.550	1.344	8.730
50	2016	0.011	0.875	0.383	0.983	8.002
50	2017	0.057	0.917	0.355	1.062	8.051
50	2018	0.013	1.000	0.403	1.740	8.049
50	2019	0.091	0.909	0.573	1.201	8.143
50	2020	0.019	0.909	0.561	0.941	8.160
51	2016	0.186	0.875	0.289	1.321	7.982
51	2017	0.095	0.909	0.551	0.760	8.026
51	2018	0.153	0.875	0.431	0.688	8.077
51	2019	0.107	0.875	0.765	0.992	8.189
51	2020	0.010	0.833	0.580	1.070	8.282
52	2016	0.018	0.857	0.248	0.268	8.020
52	2017	0.004	0.889	0.241	0.349	8.044
52	2018	0.142	0.889	0.358	0.332	7.973
52	2019	0.155	0.917	0.228	0.266	7.974
52	2020	0.168	0.933	0.221	0.312	7.995
53	2016	0.030	0.875	0.514	1.118	8.188
53	2017	0.038	1.000	0.530	1.110	8.236
53	2018	0.042	1.000	0.587	0.990	8.271
53	2019	0.028	0.917	0.693	0.850	8.329
53	2020	0.057	0.923	0.607	1.061	8.351
54	2016	0.040	0.875	0.535	0.853	8.390
54	2017	0.042	0.909	0.592	0.936	8.480
54	2018	0.230	0.909	0.508	0.141	8.528
54	2019	0.214	0.875	0.693	0.104	8.572
54	2020	0.161	1.000	0.763	1.153	8.626
55	2016	0.144	0.875	0.795	0.262	7.206
55	2017	0.122	0.889	0.785	0.223	7.199
55	2018	0.096	0.889	0.697	0.248	7.224
55	2019	0.279	0.938	0.668	0.287	7.319
55	2020	0.279	0.909	0.683	0.280	7.355
56	2016	0.110	0.889	1.307	0.853	7.723

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
56	2017	0.059	0.889	1.229	0.936	7.677
56	2018	0.244	1.000	1.033	1.153	7.537
56	2019	0.124	1.000	0.810	0.599	7.499
56	2020	0.126	1.000	0.746	0.833	7.479
57	2016	0.117	1.000	0.156	0.912	7.687
57	2017	0.087	0.889	0.174	1.041	7.724
57	2018	0.085	0.889	0.336	0.697	7.561
57	2019	0.077	0.909	0.322	1.042	7.625
57	2020	0.062	1.000	0.377	0.905	7.619
58	2016	0.067	1.000	0.393	0.593	8.216
58	2017	0.052	0.818	0.444	1.153	8.218
58	2018	0.023	0.889	0.384	0.694	8.251
58	2019	0.023	0.935	0.328	0.715	8.269
58	2020	0.284	0.571	0.270	0.576	8.317
59	2016	0.002	0.909	0.142	1.174	7.392
59	2017	0.034	0.923	0.104	0.983	7.391
59	2018	0.140	0.923	0.090	1.327	7.427
59	2019	0.082	0.714	0.188	1.191	7.495
59	2020	0.306	0.938	0.295	1.296	7.609
60	2016	0.169	0.941	0.582	2.606	7.709
60	2017	0.292	0.875	0.529	1.987	7.793
60	2018	0.214	0.889	0.569	1.757	7.796
60	2019	0.004	0.857	0.462	1.574	7.809
60	2020	0.004	0.714	0.507	1.555	7.739
61	2016	0.118	0.571	0.437	1.307	8.142
61	2017	0.262	0.899	0.465	1.222	8.216
61	2018	0.103	0.909	0.486	2.680	8.248
61	2019	0.134	0.944	0.495	2.262	8.287
61	2020	0.092	0.833	0.615	0.631	8.293
62	2016	0.005	0.900	1.006	1.251	7.027
62	2017	0.053	1.000	0.797	1.057	7.000
62	2018	0.054	0.909	0.966	1.244	6.977
62	2019	0.074	0.944	0.366	0.942	6.937
62	2020	0.020	0.571	0.446	1.048	6.934
63	2016	0.048	0.714	1.419	1.013	6.858
63	2017	0.088	1.000	0.867	1.156	6.861
63	2018	0.124	0.917	0.520	1.596	6.961
63	2019	0.018	0.917	0.475	1.315	7.039
63	2020	0.018	0.909	0.466	1.081	7.118
64	2016	0.161	0.938	0.381	1.153	8.338

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
64	2017	0.107	0.923	0.383	0.784	8.424
64	2018	0.005	0.923	0.394	1.019	8.414
64	2019	0.023	0.929	0.471	0.853	8.456
64	2020	0.040	0.818	0.279	0.936	8.486
65	2016	0.040	0.923	0.285	1.116	8.338
65	2017	0.042	0.571	0.295	0.007	8.424
65	2018	0.119	0.714	0.266	1.299	6.761
65	2019	0.047	0.818	0.280	1.110	6.794
65	2020	0.066	0.900	0.277	0.801	8.288
66	2016	0.111	0.929	0.240	0.987	8.207
66	2017	0.080	0.938	0.261	0.748	8.288
66	2018	0.047	0.818	0.240	0.757	8.377
66	2019	0.076	0.818	0.216	0.702	8.425
66	2020	0.228	0.818	0.820	0.698	8.452
67	2016	0.221	0.875	0.888	0.677	8.486
67	2017	0.365	0.727	0.801	0.992	8.338
67	2018	0.056	0.889	0.855	0.856	8.424
67	2019	0.017	0.889	0.868	0.321	6.072
67	2020	0.124	0.900	0.078	1.153	6.505
68	2016	0.115	0.889	0.091	2.576	7.511
68	2017	0.136	0.818	0.148	2.284	7.538
68	2018	0.040	0.900	0.191	0.254	7.508
68	2019	0.020	1.000	0.239	0.226	7.640
68	2020	0.011	0.714	0.265	0.206	7.651
69	2016	0.287	0.875	0.221	0.853	8.390
69	2017	0.027	0.857	0.229	0.936	8.480
69	2018	0.004	0.938	0.253	0.753	8.528
69	2019	0.160	0.917	0.303	2.074	8.572
69	2020	0.160	0.818	0.294	0.853	8.626
70	2016	0.197	0.800	0.280	1.327	7.673
70	2017	0.263	0.867	0.284	1.191	7.797
70	2018	0.032	0.889	0.382	1.296	7.617
70	2019	0.071	0.875	0.283	2.606	7.675
70	2020	0.104	0.818	0.271	1.987	7.686
71	2016	0.100	0.889	0.267	1.757	7.125
71	2017	0.077	0.818	0.236	1.153	7.092
71	2018	0.072	0.857	0.241	1.146	7.102
71	2019	0.075	0.917	1.139	1.306	7.169
71	2020	0.037	0.938	0.939	1.568	7.165
72	2016	0.064	1.000	0.728	1.642	7.469

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
72	2017	0.028	1.000	0.673	1.486	7.421
72	2018	0.088	0.875	0.587	0.912	7.434
72	2019	0.033	0.899	0.476	0.796	7.441
72	2020	0.033	0.714	0.437	0.619	7.458
73	2016	0.228	0.938	0.388	1.049	7.102
73	2017	0.327	0.909	0.347	0.796	7.097
73	2018	0.223	0.889	0.346	0.650	7.090
73	2019	0.221	0.917	0.348	0.685	7.118
73	2020	0.228	0.900	0.347	0.827	7.125
74	2016	0.218	1.000	0.310	0.621	7.198
74	2017	0.272	1.000	0.357	1.249	7.279
74	2018	0.284	0.889	0.369	0.998	7.338
74	2019	0.246	0.714	0.683	1.424	7.416
74	2020	0.269	0.899	0.679	1.520	7.426
75	2016	0.319	0.917	0.594	0.553	6.505
75	2017	0.328	0.933	0.763	0.735	7.511
75	2018	0.313	1.000	0.754	0.548	7.538
75	2019	0.060	1.000	1.087	0.832	7.508
75	2020	0.064	0.750	1.053	1.234	7.640
76	2016	0.038	0.899	1.011	0.853	7.651
76	2017	0.041	0.714	0.906	0.936	8.390
76	2018	0.105	0.917	0.889	0.704	8.480
76	2019	0.125	0.917	0.530	1.576	8.528
76	2020	0.120	0.833	0.526	1.539	8.572
77	2016	0.236	0.938	0.537	2.212	8.626
77	2017	0.187	0.875	0.452	2.227	7.673
77	2018	0.160	0.889	0.403	2.267	7.797
77	2019	0.125	0.900	0.046	3.011	7.617
77	2020	0.137	0.833	0.075	1.263	7.675
78	2016	0.066	0.867	0.075	1.153	7.686
78	2017	0.076	0.875	0.084	1.068	7.125
78	2018	0.072	0.944	0.364	0.722	7.092
78	2019	0.080	0.750	0.560	0.520	7.102
78	2020	0.080	1.000	0.524	1.152	7.169
79	2016	0.087	0.889	0.526	0.998	7.165
79	2017	0.094	0.833	0.555	0.828	7.469
79	2018	0.022	0.889	0.025	0.831	7.421
79	2019	0.096	0.909	0.718	0.625	7.434
79	2020	0.056	0.714	0.710	0.904	7.441
80	2016	0.081	0.900	0.636	0.695	7.458

Pension Scheme	Year	ROI	Portfolio Mix	Operating costs	Liquidity	Fund size
80	2017	0.091	0.867	0.567	0.759	7.102
80	2018	0.051	0.750	0.491	1.151	7.097
80	2019	0.074	0.909	0.492	0.499	7.090
80	2020	0.058	0.900	0.448	0.616	7.118
81	2016	0.065	0.909	0.423	0.918	7.125
81	2017	0.054	0.889	0.437	1.343	7.198
81	2018	0.047	0.800	0.486	1.610	7.279
81	2019	0.014	0.900	0.392	1.804	7.338
81	2020	0.014	1.000	0.280	1.646	7.416
82	2016	0.348	0.941	0.530	1.357	7.426
82	2017	0.254	0.900	0.468	0.588	8.216
82	2018	0.083	0.818	0.450	1.054	8.248
82	2019	0.085	0.900	0.442	1.592	8.287
82	2020	0.099	0.889	0.341	2.182	8.293
83	2016	0.221	0.833	0.283	1.610	7.027
83	2017	0.365	0.833	0.400	1.804	7.000
83	2018	0.056	0.750	0.318	0.853	6.977
83	2019	0.017	0.944	0.399	0.936	6.937
83	2020	0.124	0.899	0.400	1.111	6.934
84	2016	0.091	0.800	0.335	1.424	6.858
84	2017	0.138	0.889	0.326	1.520	6.861
84	2018	0.111	0.800	0.338	0.553	6.961
84	2019	0.078	0.800	0.376	0.735	7.039
84	2020	0.067	0.899	0.337	0.548	7.118
85	2016	0.066	0.889	0.460	0.832	8.338
85	2017	0.066	0.800	0.679	1.234	8.424
85	2018	0.067	0.909	0.414	0.853	8.414
85	2019	0.055	0.833	0.737	0.936	8.456
85	2020	0.055	0.909	0.546	0.704	8.486
86	2016	0.042	0.909	0.390	1.576	8.338
86	2017	0.294	0.909	0.440	1.539	8.424
86	2018	0.113	0.889	0.420	2.212	6.761
86	2019	0.188	1.000	0.380	2.227	6.794
86	2020	0.205	0.933	0.230	2.267	8.288