

**THE EFFECT OF LIQUIDITY RISK ON THE FINANCIAL
PERFORMANCE OF PENSION FUNDS IN KENYA**

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DECLARATION

This research project is my original work and has not been submitted for examination in any other university.

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

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DEDICATION

This research project is dedicated to my dear parents and my family for laying the strong foundation to my life. I am humbled to have you.

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LIST OF ABBREVIATIONS

BHC	Bank Holding Companies
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
GDP	Gross Domestic Product
LCR	Liquidity Coverage Ratio
LOTA	Loan to Total Assets
NSE	Nairobi Securities Exchange
NSF	Non-Sufficient Funds
ROA	Return on Assets

ABSTRACT

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The fear about disappearing of liquidity from financial markets, when it is most needed, has been becoming more and more pronounced among investors. According to Scholes (2000), one of the reasons for market liquidity failure is the risk-management of financial institutions. Therefore financial institutions should mitigate the risk of evaporating liquidity. Liquidity is a very important asset price determinant, asset prices can be fully derived from investors' need for liquidity, and that they avoid financial assets which sell at a premium. Keene and Petersen (2007) observed find that liquidity is an important factor when considering investment decisions they employed the Fama-French time-series regressions approach to examine liquidity as a risk factor affecting stock returns, supports these findings. They conclude that liquidity risk is an important factor even after controlling for the effects of market, size, book-to-market equity and momentum. Pension funds are subject to quite heavy regulation (leveraging, usage of derivatives, short selling, etc.), and therefore enhancing performance through exposure to risk is very limited (Sadka, Dong, & Feng 2011).

Pension schemes the world over operate under the basic principles that seek to ensure growth of pension assets to provide an adequate replacement rate for life in retirement without compromising the security of pension investments (Barrow, 2008). Regardless of the particular form of a pension scheme, investment decisions need to be taken, taking into account the retirement benefits that are guaranteed or targeted. In

other words, the key task is to ensure that at the end of the day, assets (contributions plus investment returns) are adequate to pay for liabilities at the time they fall due. In the case of a defined benefit (DB) plan, the plan liabilities are defined by the obligations stipulated in the arrangement. In a defined contributory (DC) plan, on the other hand, each individual member of the plan must determine what his targeted benefit level is.

Pension funds have to pay out benefits, foundations have spending requirements, and all institutional investors face the occasional need to rebalance their asset mixes. Some investors enter into hedging contracts that may require funding, and others commit funds to real estate or infrastructure funds that make capital calls from time to time. All of these activities require cash. Liquidity risk refers to the risk that an investor is unable to raise necessary cash within the time frame required to meet such payments. Traditionally, institutional investors have mitigated this risk by holding the bulk of their assets in relatively liquid form – publicly traded stocks, bonds and money market instruments – securities that can be sold for cash in a relatively short time frame. However, many institutions do not face the need to liquidate the bulk of their assets for a very long time, if ever. Furthermore, there are several less-liquid investment classes that offer profound benefits to investors. These facts suggest that institutional investors could examine their actual need for liquidity, come to an understanding of their ability to take a measured degree of liquidity risk, and allocate part of their assets to less-liquid investments in order to gain the benefits they provide. We consider these points in more detail below.

The liquidity characteristics of assets pervasively affect returns. Finance theory predicts a positive relation between illiquidity and required rates of return (Amihud & Mendelson (1986)) because illiquid assets must offer a higher expected return than their liquid counterparts in order to attract investors. Moreover, since liquidity systematically varies over time (Chorida, Roll, & Subrahmanyam (2001)) theory also suggests that liquidity risk, the covariance of asset returns to innovations in market liquidity, should be priced (Acharya & Pedersen (2005)). Liquidity transformation is the creation of liquid claims that are backed by illiquid assets is a key function of many financial intermediaries. For instance, banks hold illiquid loans but supply investors with highly liquid deposits. Many pension funds provide similar liquidity services through trading. For example, although they may invest in relatively illiquid assets such as corporate bonds, bank loans, and emerging market stocks, pension funds have liquid liabilities. (Feroli et al, 2014).

Financial institutions are faced with various types of risk, such as interest rate risk, market risk, credit risk, operational risk and other risks that threaten the solvency of financial institution, but liquidity risk is perceived as a normal aspect of everyday processes in financial institutions. Various sources distinguish two types of liquidity risk: asset side of balance and liability side of balance liquidity risk (Brunnermeier & Pedersen, 2009). The asset's side liquidity is related to the ease with which assets are traded and liability's side liquidity is related to the ease with which financial institutions can obtain funding or meet their obligations (Tirole, 2009). Liability side liquidity risk arises when financial institutions liability holders, such as depositors and investors, seek cash in their financial claims immediately. Usually financial institutions tend to minimize their holdings in cash, since it does not pay any interest,

and tend to invest in less liquid and longer maturity financial assets to generate interests. If financial institutions have less cash than their liability holders wish to withdraw, it has to liquidate their assets to cover the difference (Saunders, 2003).

1.1.1 Liquidity Risk

Liquidity is the term used to describe how easy it is to convert assets to cash. The most liquid asset, and what everything else is compared to, is cash. This is because it can always be used easily and immediately. Liquid assets are important to have in times of crisis or emergency because they are so easily converted into cash. Without liquidity, money can become tied up in systems that are difficult to cash out of and even more difficult to assess for actual cash value. During times of emergency, large financial institutions shut down, making it difficult for people to access the cash they need to buy essentials like food, gasoline and other emergency supplies (Chaplin, Emblow & Michael, 2000).

Liquidity risk is the possibility that over a specific time period, a financial institution will become unable to settle obligations with immediacy (Drehmann and Nikolaou, 2009). It is a risk arising from a firm's inability to meet its obligations when they come due without incurring unacceptable losses. This risk can adversely affect both earnings and the capital and therefore, it becomes the top priority of management to ensure the availability of sufficient funds to meet future demands. The vulnerability of financial institutions to liquidity risk is determined by the funding risk and the market risk. Liquidity risk needs to be monitored as part of the enterprise wide risk management process, taking into account market risk and credit risk to ensure stability in the balance sheet and dynamic management of liquidity risk. Jenkinson

(2008), noted that Liquidity risk not only affects the performance of pension funds but also its reputation. Pension fund may lose the confidence of its customers if funds are not timely provided to them. The pension fund's reputation may become at stake in this situation.

1.1.2 Financial Performance

Financial performance of a firm normally originates from the financial position and structure of the firm. This information is derived from the financial statement which is the yard stick to evaluate and monitor performance. Business executives use financial statements to draft a comprehensive financial plan that will maximize shareholders wealth and minimize possible risks that may preexist. Financial Statements evaluate the financial position and performance of a firm. These statements are prepared and produced for external stakeholders for example: shareholders, government agencies and lenders (Rahaman, 2010).

Performance measurement has become a popular area in the financial literature. A number of studies have introduced various extensive performance evaluation techniques and sought to measure the performance of pension funds to see whether they can earn more than the expected returns. Furthermore, understanding pension fund performance is a key to portfolio management. It allows managers to recognize their position and helps investors to understand the pension strategies and to select the portfolio which best meets their preferences.

Financial performance measures how well a firm is generate value for the owners. It can be measured through various financial measures such as profit after tax, return on assets (ROA), return on equity (ROE), earnings per share and any market value ration that is generally accepted (Pandey, 1985).The financial performance of financial institutions can be measured using a combination of financial ratios analysis, benchmarking, and measuring performance against budget or a mix of these methodologies. The financial statements of financial institutions commonly contain a variety of financial ratios designed to give an indication of the corporation's performance (Oye, 2006).

1.1.3 Liquidity Risk and Financial Performance

According to a study conducted by Shano, Ganesh & Mwaura (2009) on the performance of equity funds in Kenya between 2005 and 2009, the finding was that the mutual funds did not perform better than the market on a risk -adjusted basis using various performance measures. The funds were neither preferable nor outperform the market. While the performance of mutual funds has improved tremendously due to public confidence and uptake, it is still necessary to study why some funds outperform others in an efficient market. Larger funds perform better suggesting the presence of significant economies of scale in the mutual fund industry worldwide. Fund age is negatively related with fund performance indicating that younger funds tend to perform better. Additional tests show that fees (annual and initial charges) are positively associated with performance. If fees are seen as the price that uninformed investors pay to managers to invest their money, when paying higher fees investors are paying the benefits associated to that investment, and obtain better performance. Mutual funds managed by an individual manager perform better.

Liquidity problems may affect mutual funds earnings and capital and in extreme circumstances may result in the collapse of otherwise solvent mutual funds. Most mutual funds may have to borrow from the market even at an exceptionally high rate during a liquidity crisis. This ultimately causes a decline in the earnings. Moreover, further borrowing to meet customers demand may place the firm's capital at stake. Thus, debt to equity ratio will rise, affecting the firm's effort to maintain an optimal capital structure (Muranaga & Ohsawa, 2002). Liquidity risk may cause a fire sale of the assets of the firm which may spill over into an impairment of the capital base. If the financial institutions face a situation in which it has to sell a large number of its illiquid assets to meet the funding requirements perhaps to reduce the leverage in conformity with the requirement of capital adequacy the fire sale risk may arise. This scenario may dictate to offer price discount to attract buyers. This situation will have a knock on effect on the balance sheets of other institutions as they will also be obliged to mark their assets to the fire sale price (Brunnermeier & Yogo, 2009).

1.1.4 Pension Funds in Kenya

Retirement is defined as the period immediately following exit from active employment and is one of the key transitions expected in later life (Kee-Lee & Chow, 2005). Although retirement is marked by an age when one stops working, there is great variation across the world regarding the exact time when people completely withdraw from workforce or active life. For instance, Kenya recently raised the retirement age to 60 years departing from age 55 set during the colonial administration. Over the course of life, a number of social and economic contingencies are likely to occur, which become more pronounced in later life. Such

include exiting labour force due to old age, sickness, workplace injuries, disability, or unemployment, all of which affect all the retirees (Kakwani & Son, 2006).

Globally, risks associated with retirement are cushioned by pensions defined as a standard contract between employers and retired employees, for a fixed amount of money paid on a regular or one-time basis to a retiree following sequestration from service. There are various forms of pension schemes around the world classified in different ways. Kenya has a Retirement Benefits Act (1997) and other legislations that provide a comprehensive legal and regulatory framework and a regulatory agency, the Retirement Benefits Authority (RBA). The mandate of RBA is to regulate, supervise and promote the retirement benefits sector. However, only 20% of the country's retired population has a reliable safety net in times of need (Retirement Benefits Authority [RBA], 2007). While a formal system of social security program exists in Kenya, it has a very limited coverage to only a small segment of the society.

The Pensions schemes are classified as the National Social Security Fund (NSSF), the Civil Servants Pension Scheme (CSPS), Occupational based pension schemes and Voluntary individual schemes. Until 2013, the NSSF has operated under an Act of Parliament as a provident fund and covering employees in the formal sector excluding public service employees. However, under the NSSF Act (2013) it has transformed a defined contribution mandatory scheme. The CSPS is also established under an Act of Parliament and covers all public service servants including teachers. It is a non-funded and non-contributory scheme. On the other hand, occupational schemes are established under trust and mainly cover formal sector workers who work in companies that operate retirement schemes. Also established under the trust are the

individual schemes that are open to all who would like to join on voluntary basis and are mainly started by insurance and investment companies (Raichura, 2008).

1.2 Research Problem

The investment environment within which the pension funds operate are faced with a number of challenges chief among them is the risk. Risk basically is the variability of the portfolio return as a result of unforeseen circumstances. Diversification of the investment assets forms a critical component of a fund manager's strategy in their endeavor to improve the portfolio returns. Generally, there is a positive relationship between the number of assets held by a fund manager in an investment. Ramasang (2003) observed that robust growth in fund management in emerging markets has resulted in a rapid increase in investment firms offering diversified portfolio funds. However, the investors, while evaluating these factors, do not investigate them conclusively before settling on a fund to invest in. Pension funds in Kenya have recorded significant growth in the last two decades and the rapidly growing middle class is gradually gaining interest in them (Kariuki, 2012).

Cheong (2006) who carried out a research on factors influencing unit trust performance in Singapore using secondary data research and his results revealed that large funds outperformed small funds, although better performance of large funds was not significant. Rozali (2006) did a study on market timing and security selection performance on pension funds in Malaysia using a sample of 102 equity based unit trust funds which revealed that Fund Managers appear to possess inferior selection skills and poor market timing abilities. Khorana *et al.* (2007) analyzed the relationship between fund managers' ownership and fund performance. They found evidence of

positive correlation characterized by higher excess return generated by pension funds as the ownership stake of their fund managers increases. These studies on performance of pension funds resulted to mixed findings, thus it is not clear on what specific factors affect profitability of pension funds.

Kagunga (2010) investigated the performance of pension funds compared to that of market portfolio of shares at Nairobi Stock exchange. He employed descriptive survey in his study which revealed that pension funds outperformed the market which was attributed to access to private information by the Managers. Maiyo (2007) in her study of the performance of funds in Kenya, using cross sectional survey, observed that the main reason for low performance of some funds was due to the portfolios having instruments of various categories put together in varying proportions. Maina (2011) evaluated portfolio management by unit trusts in Kenya and revealed that performance of funds is highly influenced by the nature and type of asset selection by fund managers. Kasanga(2011) in a study of determinants of performance of funds in Kenya found that forecast ability, market timing ability and security selection techniques to be important determinants of performance. His research however did not cover other determinants such as growth in size and expense ratio. Kagunda (2011) evaluated asset allocation by fund managers and the financial performance of unit trusts. She revealed that fund managers have access to private information leading to a high performance as compared to the market performance. Her research covered equity funds only.

All the above studies were carried out in isolation, hence it cannot be concluded that a particular factor is solely responsible for how pension funds' performance. This implies that limited research was carried out in examining the factors that effect of liquidity risk on the performance of pension funds and to what extent. This study sought to fill this gap in knowledge by addressing the following question: What is the effect of liquidity risk on the performance of pension funds in Kenya?

1.3 Research Objective

The objective of this study is to determine the effect of liquidity risk on the financial performance of pension funds in Kenya.

1.4 Value of the Study

Choosing the right pension fund has considerable effects especially for individual investors in Kenya who are increasingly relying on collective investment schemes to accumulate wealth. In a rational market, all consumers desire investments which have the highest probability of maximizing return for a given level of risk. Some academicians claim that pension funds possessing some unique attributes perform better than others, which is indeed the basis of this research. The findings of this study will be of most benefit to two groups of people; investors and policy makers.

Investors will be in a better position to make informed choices on which fund to invest their money in based on specific fund attributes. Given the wide array and increasing number of pension funds in Kenya, the investor needs to be able to make sound investment decisions. By studying specific fund attributes such as the age, size and transaction fees, the research will be able to deduce a trend on the effects of these attributes to the returns of mutual funds.

Policy makers in Kenya, such as the Capital Markets Authority and the Retirements Benefits Authority, will also benefit from this research while formulating guidelines governing the Collective Investment Schemes. This will ensure that individual investors are earning the maximum return from their investment and not being manipulated by fund managers through hidden costs. This study could also help in setting the minimum size and age entry requirements for new players in the mutual fund industry.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the existing studies on the effect of liquidity risk on the performance of pension funds in Kenya. In specific the study reviews the theoretical review, determinants of performance, empirical literature review, conceptual framework and summary of the literature review.

2.2 Theoretical Review

This study seeks to establish the effect of liquidity risk on the performance of pension funds in Kenya. The study will be guided by the efficient market hypotheses, portfolio theory and capital asset pricing model.

2.2.1 Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH) states that at any given time, security prices fully reflect all available information Fama(1970). The securities markets are extremely efficient in reflecting information about individual stocks and about the stock market as a whole. The accepted view is that when information arises, the news spreads very quickly and is incorporated into the prices. There are three forms of the efficient market hypothesis; i).the weak form asserts that all past market prices and data are fully reflected in securities prices. In other words, technical analysis is of no use; ii).the semi-strong form asserts that all publicly available information is fully reflected in securities prices. In other words, fundamental analysis is of no use and

iii).the strong form asserts that all information is fully reflected in securities prices. In other words, even insider information is of no use Fama(1970).

The most direct and most convincing test of market efficiency is direct test of the ability of professional Fund Manager to outperform the market as a whole. Surely, if the market prices were determined by irrational investors and systematically deviated from rational estimates of the present value of corporates and if it were easy to spot predictable patterns in security of returns on anomalous security prices, then professional Fund Managers should be able to beat the Market. Direct test of the actual performance of professionals who often are compensated with strong incentives to outperform the market should represent the most competing evidence of market efficiency.

2.2.2 Modern Portfolio Theory

The Modern Portfolio Theory (MPT) was developed by Markowitz (1952); he derived the expected rate of return for a portfolio of assets and an expected risk measure. It emphasizes how risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of risk, emphasizing that risk is an inherent part of higher reward. According to the theory, it's possible to construct an efficient frontier of optimal portfolios offering the maximum expected return for a given level of risk. There are four basic steps involved in portfolio construction: security valuation, asset allocation, and portfolio optimization and performance measurement.

Portfolio theory is a mathematical formulation of the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual assets. That this is possible can be seen intuitively because different types of assets often change in value in opposite ways. For example, when prices in stock market fall, prices in the bond market often increase, and vice versa. A collection of both types of assets can therefore have lower overall risk than either individually. But diversification lowers risk even if assets returns are not negatively correlated indeed, even if they are positively correlated (Markowitz, 1952).

Many theoretical and practical criticisms have been leveled against this theory the more fundamental being its measurement of risk in terms of total risk whereas relevant risk in investment appraisal is non-diversifiable risk and the fact that financial returns do not follow a Gaussian distribution or indeed any symmetric distribution, and the correlations between asset classes (Micheal, 1998). The implication of MPT is that a rational investor will not invest in a portfolio if a second portfolio exists with a more favorable risk-expected return profile. The mutual fund managers will therefore assemble assets in their portfolio that are likely to record high portfolio return within any given level of risk.

2.2.3 Capital Asset Pricing Model

Capital Asset Pricing Model (CAPM) was developed independently by three scholars Sharpe 1964. The model is based on portfolio theory and demonstrates how risk and return could be linked together and also specifies the nature of risk/ return relationship. In such a simple world, Tobin's (1958) super-efficient portfolio must be

the market portfolio. All investors will hold the market portfolio, leveraging or de-leveraging it with positions in the risk free asset in order to achieve a desired level of risk. For any security or portfolio, the CAPM decomposes and quantifies the total risk of a portfolio or individual assets into components: diversifiable (specific risk) and non-diversifiable risk (systematic risk).

Systematic risk is the risk of holding the market portfolio. As the market moves, each individual asset is more or less affected. To the extent that any asset participates in such general market moves, that asset entails systematic risk. Specific risk is the risk which is unique to an individual asset. It represents the component of an asset's return which is uncorrelated with general market moves (Lintner, 1965). Unsystematic risk is the risk to an asset's value caused by factors that are specific to an organization, such as changes in senior management or product lines.

Unsystematic risk is present due to the fact that every company is endowed with a unique collection of assets, ideas and personnel whose aggregate productivity may vary. A fundamental principle of modern portfolio theory is that unsystematic risk can be mitigated through diversification. That is by holding many different assets; random fluctuations in the value of one will be offset by fluctuations in another (Markowitz, 1952). Systematic risk is risk that cannot be removed by diversification. This risk represents the variation in an asset's value caused by unpredictable economic movements. This type of risk represents the necessary risk that owners of a firm must accept when launching an enterprise. In the CAPM, the risk associated with an asset is measured in relationship to the risk of the market as a whole (Sharpe, 1964).

2.3 Determinants of Financial Performance

2.3.1 Fund Size

Managers who outperform the market usually draw significant new money from investors who want to profit from the manager's added-value strategies, resulting in the fund growing bigger (Beckers & Vaughan, 2001). Large pension funds are able to spread fixed overhead expenses over a larger asset base. Further, managers of big funds can gain positions in beneficial investment opportunities not available to smaller market participants (Ciccotello & Gant, 1996). Smith (1994) suggests that big fund companies routinely are allocated shares in oversubscribed IPOs. Among others, Glosten and Harris (1988) found that large funds are able to accomplish trades at more favorable spreads, given their market positions and large trading volumes.

As a big mutual fund keeps on growing it has to continue to find worthwhile investment opportunities. Big funds sometimes have to take on larger positions per stock than optimal whereas small funds can put all the money in their best ideas. Liquidity means that a big fund needs to find more stock ideas than its small peers. Presumably, a large fund can afford to hire additional managers and thereby cover more stocks and generate additional good ideas; meaning that large mutual funds can take small positions in lots of stocks Chen *et al* (2003).

2.3.2 Cash inflows

A large inflow of capital can cause administration stress i.e. organizations has to hire new people to accommodate growth from which the portfolio management process may suffer. This administration stress can also take place when the mutual fund experiences large cash outflows (Indro *et al*, 1999).

New cash inflows into mutual funds can cause managers to invest in stocks in which they might not otherwise invest. Besides, the cash inflow can cause managers to make suboptimal investment decisions, where relatively poor decisions can represent a performance drag. The reason is that if managers receive large injections of cash, they might spend less time on research for each stock they decide to invest in, resulting in a low information decision (Chan *et al*, 2005).

2.3.3 Firm Age

The age of a pension fund could play a role in deciding performance since younger funds may face significant higher costs in their startup period. This is due to marketing costs but also that the initial cash flows will place a greater burden on the fund's transaction costs. There is also evidence showing that return of new mutual funds may be affected by an investment learning period (Gregory *et al*, 1997). One of the reasons for underperformance of younger funds according to Bauer *et al* (2002) is their exposure to higher market risk since they are invested in fewer stocks.

There is a relationship between fund age and fund size; young funds tend to be smaller than older ones, which make the young funds' returns and ratings more vulnerable for manipulation. The smaller the fund, the more a handful of fortunate stock picks can buoy the performance of the entire fund. Moreover, because young mutual funds are typically smaller, fund families may be able to afford to waive some of the expenses (Adkisson & Fraser, 2003).

2.3.4 Expense Ratio

Actively managed funds incur various costs, including operating and research expenses, which are measured by the expense ratio. Indro et al. (1999) defined expense ratio as the proportion of assets paid for operating expenses and management fees, including administration fees and other costs, but excluding brokerage costs. Even though various costs are included in the ratio, most of the expenses can be associated with financial market research, as Indro et al. (1999) considered explicit cost of research to be reflected by the ratio, which is the price paid by uninformed investors to be informed. Early study by Sharpe (1966) finds that funds with lower expenses tend to have better performance.

However, the extensive work of Friend et al. (1970) published in a book, report no significant relation between performance and expense ratio and only a slight positive relation with turnover ratio. Ippolito (1989) finds that the risk-adjusted returns, net of fees and expenses of active portfolios are comparable to those of index funds and that fund performance is not related to portfolio turnover and management fees. Grinblatt and Titman (1989, 1992) also report that mutual funds are able to generate sufficient returns to offset the expenses that they incurred. The findings of these studies are inconsistent with the so-called original version of efficient market theory (EMT, hereafter) which implies that expenditures of money on research and trading are wasted in a market in which securities prices already incorporate all available information. This version of EMT predicts that active management of fund will result in alphas equal to the negative of the expenses incurred in acquiring the information

2.4 Empirical Literature

2.4.1 Global Studies

Corresponding to the growth in the fund industry during the past few decades, there has been extensive research in this area with a variety of different data, periods and methodology. Many studies have been carried out mainly in US, Great Britain, Australia and Japan. Very few studies outside these countries due to the fact that mutual funds and unit trust are relatively new investment in many parts of the world. Grinblatt and Titmann (1989) studied funds during 1975 to 1984 using both actual returns and gross returns. They employ Jensen's single-index measure with four sets of benchmarks. They find significantly superior performance among growth funds when gross returns data are employed but evidence of this vanishes when using actual returns. Hence, they conclude that growth funds outperformed the market but the evidence disappeared because of its high expenses.

Cumby and Glen (1990) investigate 15 U.S.-based international funds during the period 1982-1988. They employ Jensen's measure and the Positive Period Weighting proposed by Grinblatt and Titmann (1989) and find positive alphas in only 3 funds though even these are not statistically significant. They also look into market timing ability as a part of their mutual fund performance study. Using Treynor and Mazuy's timing model, they find evidence of negative market timing ability. Similarly, Malkiel (1995) examines fund performance in the U.S market during the period 1972-1991 using Jensen's single-factor model. He finds the average alpha equals to -0.6% with very low t-statistic value. He reveals that, on average, mutual funds have underperformed benchmark both before and after fees and expenses have been deducted.

Gruber (1996) analyses common equity fund performance from 1985 to 1994 using a relative return to the market, Jensen's measure and multifactor model. The multifactor model includes four variables, namely market return premium, difference in return between small and large cap stocks, difference in return between growth and value and bond return premium. Using 270 mutual funds, he finds that mutual funds underperform the market by 1.56% and 0.65% per year using respectively a single factor model and a multifactor model.

Chen et al. (2000) examined mutual funds during 1975 to 1995. They conclude that fund managers have selectivity ability. They employ stock held and trading data in mutual funds and reveal that fund managers did not hold outperforming stocks but the stocks which they bought significantly outperformed the stock which they sold by 2% per year. However, selectivity ability vanishes because fund managers usually hold stocks for longer than a year. Khorana *et al.* (2007) analyzed the relationship between fund managers ownership and fund performance. They found evidence of positive correlation characterized by higher excess return generated by mutual funds as the ownership stake of their fund managers increases.

Pástor & Stambaugh (2003) demonstrated that market wide liquidity appears to be stable variable that is important in pricing common stocks. They found that expected stock returns are cross-sectional related to the sensitivity of stock returns to aggregate liquidity. According to their measure, smaller stocks are less liquid and thus highly sensitive to aggregate liquidity. In addition, research by Li, Mooradian, and Zhang (2007) supports the hypothesis that market wide liquidity is an important risk factor and has a significant effect on expected returns.

Lou & Sadka(2011) documented the importance of distinguishing between liquidity level as measured by the illiquidity measure of Amihud (2002) and liquidity risk, which measures sensitivity to changes in market wide liquidity. They found that liquidity risk is a better predictor of stock prices during a crisis than liquidity level.

2.4.2 Local Studies

Gitagia (2013) concluded from his study that fund size and fund performance are negatively correlated so that as fund's assets rise, it is more than likely that the fund manager will be less flexible in taking decisions and will be facing a great deal of bureaucratic inefficiency as do industrial firms. It is inevitable that this would have dire consequences.

Mbataru (2009) investigated the factors influencing the performance of pension funds in Kenya. Key amongst them was size. She concluded that growth of funds is a critical determinant of performance of mutual funds. She also concluded that as funds grow larger, they tend to become less efficient in their operations.

Maina (2013) found that there was a positive relationship between fund performance and fund size. The study found that operation risks, transactions cost and fund size were statistically significant to affecting mutual fund performance in Kenya. The study found that risk in the management of mutual funds cannot be ignored in any investment venture. The risk of a security is the variability in its expected future returns. The study recommends that there is need for the management of mutual funds to mitigate operation risk involved in the mutual fund investment as it was found that

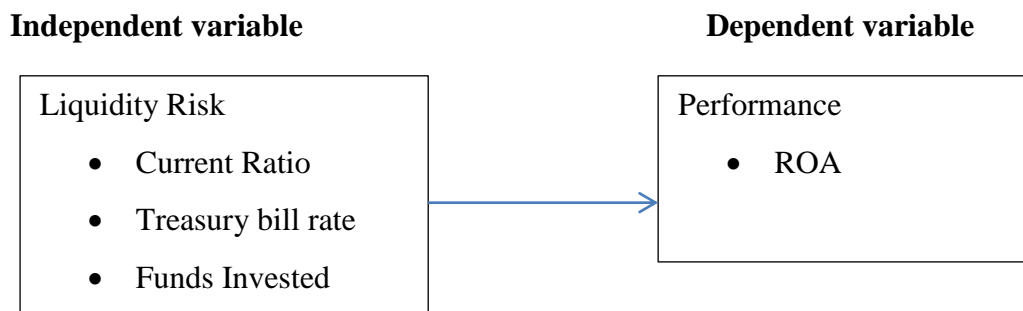
high risk securities have high dispersion around the mean while low risk securities will have a low dispersion around the mean.

Kasanga (2011) investigated the determinants of performance of pension funds in Kenya from January 2008 to December 2010. He found out that forecasting ability, market timing ability and security selection techniques employed by fund managers in managing both equity and money market portfolios were important determinants of performance. He also found out that performance of equity and money market funds managed by unit trust schemes was highly positively correlated with forecasting ability, market timing and security selection techniques.

2.5 Conceptual Framework

Conceptual framework, according to researcher Saunders (2007) are structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. According to Young (2009), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. In this study, the conceptual framework will look at the effect of liquidity risk on the performance of pension funds in Kenya. The independent variable is the liquidity risk while the dependent variable is the performance.

Figure 2.1: Conceptual framework



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the methodology and procedures to be used in data collection. Section 3.2 outlines for the research design applied, section 3.3 presents target population and sample size, section 3.4 discusses the data analysis models employed, section 3.5 shows the data collection methods used in the study and section outlines the data reliability and validity.

3.2 Research Design

The study used longitudinal descriptive survey utilizing data from the year 2011 to 2015 for various funds. The major purpose of longitudinal research design is to present a time series data and changes over time period. According to Robson (2002), the research design portrays an accurate profile of persons, events or situations.

3.3 Population and Sample

The total population was the entire spectrum of a system or process of interest. It is the Universe of people to which the study can be generalized (Johnston and VanderStoep, 2009). According to the Retirement Benefits Authority (RBA) (2015) there are one thousand three hundred and eight (1,308).

3.4 Sample

The entire population was divided into stratus based on the two designs of pension schemes (Defined Benefits pension schemes and Defined Contribution pension schemes). From the stratum 80 Pension schemes were selected randomly to ensure that each of the schemes has an equal chance of being selected. The pension scheme selected had to be a segregated Pension scheme which have been inexistence for the last 5 years and had used the same fund manager over the period of study

3.5 Data and Data Collection

The information required for this study will be secondary data. The data will be obtained from the business annual report and other relevant company documentations or records available in the library and also in the web sites.

3.5.1 Data Reliability and Validity

Reliability and validity are tools of an essentially positivist epistemology winter (2000). For reliability and validity to exist in data, the data collection techniques must yield information that is not only relevant to the research hypothesis but also correct. Reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In short, it is the stability or consistency of scores over time or across raters. The researcher will use the Cronbach's Coefficient Alpha which measures the internal consistence of data.

Validity is the accuracy and meaningfulness of inferences which are based on the research results. It's the degree to which results obtained from the analysis of the data actually represents the phenomenon under study. Validity is largely determined by the

presence or absence of systematic error in data. The researcher will use content validity which is a measure of the degree to which data collected using a particular instrument represents a specific domain of indicators or content of a particular concept.

3.6 Data Analysis

Secondary data will be the main source of data for the study. The return on assets (ROA) will be used to calculate the performance of pension funds.

This study will employ the Jensen's model to calculate the risk adjusted returns with the following regression specification:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + e$$

Where:

Y = Performance, ROA = (Net Income/Total Assets)

X₁ = Current ratio= Current Assets/ Current Liabilities (Liquidity Risk)

X₂ = Treasury bill rate for the period (Control Variable)

X₃ = Ln Amount of funds invested (Control Variable)

3.7 Test of Significance

Linear and correlation regression analysis implements a statistical model that, when relationships between the independent variable and the dependent variables are almost linear, cause and effect relationship is expected. To confirm the hypothesis of the study; the study used F-test to determine the extent to which liquidity risk affect performance. The model of coefficients of the independent variables and there P-values will also be used. The tests were performed at 95% confidence level and at 5% significance level.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section presents the outcome of results and findings on the research. Inferential statistics have been employed using regression analysis to provide an insight depth into the effects of liquidity risk on the performance of pension funds in Kenya.

4.2 Response Rate

Information was collected for eighty registered pension funds, with available and complete set of data, for a period of 5 years from 2011 to 2015. Data on fund size, current assets, current liabilities, liquidity and performance of the pension funds was analyzed from the published annual financial reports as well as from the Capital Markets Authority and RBA. The high response rate can be attributed to the fact that the information sought was considered as public information and was therefore readily available.

4.3 Descriptive Statistics

Descriptive statistics including the mean, standard deviation, coefficient of variation, skewness and kurtosis describe the probability distribution of a variable. Table 4.1 below shows the descriptive statistics for each of the independent variables; Data on fund size, current assets, current liabilities, liquidity as well as the dependent variable performance as measured by the ROA is shown in Table 4.1 below

Table 4.1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	80	-7.50000	17.60000	4.9250833	5.07015908
Liquidity	80	.01200	3.85400	.5634937	.72842312
SIZE	80	2.58000	5.20000	3.8404375	.68906338
TB	80	8.15000	9.13000	8.6000000	.40833862
Valid N (listwise)	80				

The mean for the ROA was 4.92 with a standard deviation of 5.07, the maximum was 17.60 and the minimum was negative -7.50. This was an indication that there was a big variation of performance as measured by ROA with a standard deviation of 5.07. The mean for the liquidity ratio was .563 with a standard deviation of .728, the maximum was 3.85 and the minimum was .012. This was an indication that there was a big variation on the liquidity of the pension funds with a standard deviation of .728. The means for the fund size and Treasury bill rates were 3.84 and 8.6 respectively. The standard deviation for the fund size and Treasury bill rate was .689 and .408 respectively. The maximum and minimum for fund size was 5.2 and 2.58 respectively. The maximum and minimum for the Treasury bill was 9.13 and 8.15 respectively. There was an indication that the variations on the Treasury bill were very minimal. The variables have positive skewness meaning that the distribution has a longer tail on the higher-return side of the curve meaning the data is asymmetrical. A negative kurtosis is also observed, which implies a platykurtic distribution and

indicates a higher probability than a normally distributed variable of values near the mean and a lower probability than a normally distributed variable of extreme values (Cooper & Schindler, 2003).

4.4 Correlation Coefficients of Pension Funds

The study further determined the correlation between the independent variables used in the study; performance, fund size, 91 days Treasury bill rate and liquidity of pension funds. For this analysis, Pearson Correlation was used to determine the degrees of association within the independent variables and also between the independent variables and dependent variable. The analyses of these correlations seem to support the hypothesis that each independent variable has its own particular informative value in the ability to explain the returns of pension funds.

Table 4.2: Correlation Coefficients

		ROA	Liquidity	SIZE	TB
ROA	Pearson Correlation	1			
	Sig. (2-tailed)				
	N				
Liquidity	Pearson Correlation	.541 ^{**}	1		
	Sig. (2-tailed)	.000			
	N	80			
SIZE	Pearson Correlation	.479 ^{**}	.183	1	
	Sig. (2-tailed)	.001	.214		
	N	80	80		
TB	Pearson Correlation	-.091	.000	-.035	1
	Sig. (2-tailed)	.538	.998	.812	
	N	80	80	80	

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

The Correlation Matrix shows that there is a strong positive relationship between pension fund performance and liquidity risk with an association of positive .541. The relation between the fund size and performance was also positive at .479 while the relation between fund and liquidity was a positive .183 which was not very strong. The relation between the 91 days Treasury bill rate was not significant among all the variables.

4.5 Regression Analysis

Regression analysis of the model provided the results summarized in table 4.3 below.

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670 ^a	.449	.411	3.89093183

a. Predictors: (Constant), Liquidity, SIZE, TB

The coefficient of correlation, R, measures the strength and direction of a linear relationship between the dependent variable and the independent variables. This model has an R of 0.670 which indicates a strong positive relationship between the variables. The coefficient of determination, R square indicates how well data fits in the statistical model; how successful the fit is in explaining the variation of the data. In this model, 44.9% of the variations in the dependent variable are explained by the independent variables.

The predictors are viewed as statistically significant compared to all the other variables that affect returns of pension funds. The standard error is a measure of the accuracy of the predictions. A standard error of 3.890 indicates variability in the model estimates.

Table 4.4: Regression results**Coefficients^a**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.327	12.494		.026	.979
Liquidity	3.272	.792	.470	4.128	.000
SIZE	2.874	.838	.391	3.429	.001
TB	-.963	1.391	-.078	-.692	.492

a. Dependent Variable: ROA

The Beta coefficients give a measure of the contribution of each variable to the model. A large value indicates that a unit change in this predictor variable has a large effect on the criterion variable. The Regression coefficient value of liquidity risk was .792 with a p-value of less .05. The regression coefficient value of Fund size was .838 with a significance level of 0.001 while regression coefficient value of Treasury bill was 1.391 and the value was insignificant. From the table above, the regression becomes;

$$Y = 0.327 + 0.792X_1 + 0.838X_2 + 1.391X_3 + \varepsilon$$

Taking all other factors as zero, the return on fund will be 0.327. However, this is not a reasonable interpretation due to the fact that the fund size and liquidity can never be zero. The Coefficient of 0.792 indicates the difference in predicted value of Y for each one-unit difference in liquidity, all other factors held constant. From Table 4.4

above, it is evident that Fund size and transaction fees have a significant relationship with return of a mutual fund. ($p < 0.05$). The relationship between the 91 days Treasury bill and returns was not statistically significant ($p > 0.05$), implying that its beta coefficient is not significantly different from zero.

Table 4.5: Analysis of Variance

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	542.075	3	180.692	11.935	.000 ^a
	Residual	666.131	44	15.139		
	Total	1208.206	47			

a. Predictors: (Constant), Liquidity, SIZE, TB

b. Dependent Variable: ROA

The overall model was statistically significant ($P < 0.05$) as illustrated in the Analysis of Variance Table 4.4 above, indicating that all the variables have a significant relationship with the returns of pension funds in Kenya. Under the null hypothesis, the statistic has an F-distribution with 11.935 and 47 degrees of freedom at 5% level of significance and 95% confidence interval. The null hypothesis that fund characteristics and pension fund returns are unrelated was therefore rejected.

4.6 Discussion of Research Findings

The overall objective of the study was to establish the effect of liquidity risk on the performance of pension funds in Kenya, in particular the fund size and Treasury bill rate. The P value of 0.000 indicates the significance of the model and we therefore reject the null hypothesis indicating that liquidity risk has an effect on the performance of pension funds.

There was a relatively positive explanatory relationship between liquidity risk and performance of pension funds in Kenya; the coefficients are significantly different from zero. The Correlation Matrix shows that there is a strong positive relationship between fund performance and liquidity risk of pension funds with an association of positive .541. The relation between the fund size and performance was also positive at .479 while the relation between fund and liquidity was a positive .183 which was not very strong. The relation between the 91 days Treasury bill rate was not significant among all the variables.

There was also a positive correlation between fund size and performance of pension funds this means that larger funds achieve higher returns than small funds. This is in line with majority of previous studies done that might not account for country heterogeneity in industry size. Chen et al. (2004) is one such study that investigated the influence of fund management firm characteristics on pension fund management and performance and found that the degree of focus, the volume of assets under management and the number of funds offered by a management firm had a positive impact on fund performance. However, a study done on Swedish funds, which represents a much smaller industry size, by Dahlquist et al. (2000) found a positive

relationship between fund performance and small equity funds which is consistent with the findings of this study. The findings could also be attributed to the findings by Christofersen et al (2002) who indicated that country characteristics can explain the pension fund performance beyond fund attributes.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The main objective of this study was to evaluate the effects of liquidity risk on the performance of pension funds in Kenya. This chapter presents a summary of findings for the research hypothesis and each variable studied, conclusion from these findings, study recommendations, limitations of the study and future research directions.

5.2 Summary of Findings

Similar to studies previously done, this research has unveiled a relationship liquidity risk and performance of pension funds in Kenya. The pension fund size is positively and statistically significantly related to fund performance with results indicating that big funds tend to perform better than smaller funds suggesting the absence of economies of scale and efficient markets hypothesis do influence the performance. In efficient markets, the prices of the assets should reflect all available information. The coefficient of size is relatively minute meaning that even if size has an impact on return it is small. There could also be other factors that affect the variability of pension fund returns or hierarchies involved in processing soft information. Chen et al (2004), conclude that liquidity and organizational diseconomies related to hierarchy costs erode the effect of fund size on returns.

The fund size is also positively related with performance, is statistically significant ($p > 0.05$); bigger funds tend to perform better smaller funds. Smaller funds may suffer from inadequate experience and learning period, while bigger funds will be more attentive to investment opportunities. The 91 days Treasury bill rate is negatively

related to performance and it was not significant meant that the Treasury bill rate change did not have an influence on the performance because of the small variability. The coefficient of this variable was negative and was statistically not significant ($p > 0.05$) at 5% level of significance and 95% confidence level. Despite the fact that one of the independent variables, the Treasury bills being statistically insignificant, the overall model was significant and data was valid hence relevant to conclude on the findings.

5.3 Conclusion

This research builds upon existing studies to provide a framework for individual investors considering that liquidity risk and affect the performance of pension funds. It presents results concerning liquidity risk, fund size and the 91 days Treasury bill rate for 80 pension funds in Kenya over the period 2011 to 2015. The main objective of the research was to test whether this fund attributes influence returns of pension funds and based on the findings, we rejected the null hypothesis that fund attributes and returns on pension funds are unrelated. This implies that the variables under consideration, fund age, fund size and Treasury bill rate have an effect on pension fund returns.

Fund size affects returns positively; and this is support of earlier studies that found that big pension funds perform better than smaller ones. Chen et al. (2003) revealed that funds belonging to large pension fund companies perform better than others. The study also reveals that returns improve with higher liquidity. Therefore, we can conclude that the larger the fund size, the higher the return as this finding was statistically significant.

5.4 Recommendations

The evidence of this study suggests that an investor, except for risk considerations, should consider the fund characteristics of a particular fund before investing. Fund Managers should also regularly review the fund characteristics to ascertain their effect on the fund returns to ensure that investors are earning maximum returns from investing in unit trusts compared to active investment strategies. However, because the coefficients of these attributes are small, the impact of these variables are modest compared to the other factors that influence pension fund returns, such as risk.

Regulations such as minimum fund size and management costs charged by pension fund managers should be considered while approving new entrants into the pension industry as this study ascertains that some of these fund characteristics affect returns earned. Pension funds are performing below market, as evidenced by the negative Sharpe ratio values. Policy Regulators should therefore seek to regularly analyses and evaluate all portfolio factors that have an effect on fund returns other than risk, so as to ensure investors are earning maximum returns from fund management in Kenya. This will in turn improve the viability of unit trusts as viable investment options for both local and foreign investors.

5.5 Limitations of the Study

In attaining its objective, the study was limited to eighty pension funds in Kenya with complete set of data for the period 2011 to 2015. While the secondary data was verifiable, the degree of precision obtained was a limitation. The existence of low informational efficiency, where the prices of an asset do not reflect all information

available, in the Kenya pension fund industry was also a limitation to the quality of data obtained for this study.

5.6 Suggestions for Further Research

Some gaps still exist in studies on evaluating the determinants of pension fund returns. A proposal of study would be to research on the persistence of financial performance in Kenya pension funds; is it the same funds that beta their benchmark indices every year? Another research gap exists in studying the qualifications and experience of fund managers and their effect on the return of funds. This factor, though undermined, could play a role in mutual fund returns as they are actively managed and investment decisions are made at the digression of the fund manager.

A research could also be carried out to compare pension fund returns against set benchmarks to establish whether unit trusts in Kenya are performing below market. Essentially, in efficient markets, there should be no difference between investing actively versus passively but this is not the case for Kenya capital markets. A comparative study on individual investors versus institutional investors, such as pension funds, should also be carried out and an analysis done on the returns earned from both sets of investors. Institutional investors may enjoy better returns due to economies of scale compared to individual investors; factors influencing this difference in returns should be researched in detail.

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APPENDIX

Appendix I: Approved Pension Funds

No	PENSION SCHEME NAME	No	PENSION SCHEME NAME
1	ALEXANDER FORBES PROVIDENT FUND 2	33	CAA PENSION SCHEME
2	NIC BANK PENSION SCHEME	34	NBK PENSION SCHEME
3	BAMBURI CEMENT SRBS	35	KNH SRBS
4	CONSOLIDATED BANK SRBS	36	KWS PENSION FUND
5	BAT KENYA RETIREMENT FUND	37	CITI BANK SRBS
6	BOC KENYA STAFF BENEFITS SCHEME	38	HFCK SRBS
7	COMMERCIAL BANK OF AFRICA SRBS	39	NSSF KENYA SRBS
8	CENTRAL BANK OF KENYA SRBS	40	GENERAL MOTORS SRBS 2006
9	CMC SRBS	41	NHC SRBS
10	NAMPAK PENSION SCHEME	42	KNEC SRBS
11	EABL SRBS	43	STANDARD GRP. SRBS
12	GLAXO SMITHKLINE SRBS	44	STANDARD CHARTERED BANK SRBS
13	KENYA COMMERCIAL BANK SRBS	45	UNILEVER KENYA SRBS
14	TOTAL KENYA SRBS	46	UNION OF EA SRBS
15	KPA SRBS	47	KENGEN SRBS
16	KPC SRBS FUND	48	CONSOLIDATED BANK SRBS
17	KENYA AIRWAYS PROVIDENT FUND	49	HELB SRBS
18	TOYOTA KENYA SRBS	50	VIVO ENERGY PROVIDENT
19	KTDA PROVIDENT	51	GENERAL MOTORS PENSION FUND
20	KTDA PENSION	52	OXFAM PROVIDENT FUND
21	LOCAL AUTHORITIES PENSION FUND	53	CONSOLIDATED BANK SRBS
22	KENYA-RE SRBS	54	KEPHIS PROVIDENT FUND
23	OCTAGON PENSION SCHEME	55	SKF (K) LIMITED PENSION SCHEME
24	UAP INSURANCE PF	56	AIR FRANCE KENYA SRBS
25	MADISON INSURANCE COMPANY LTD SRBS	57	SASINI LTD SPS
26	VENUS TEA BROKERS LTD SRBS	58	EAGLE AFRICA SRBS
27	EAST AFRICAN CABLES LTD SPF	59	HACO INDUSTRIES LTD SRBS
28	BATA SHOE COMPANY(KENYA) LTD SRBS	60	NATION MEDIA GROUP SRBS
29	KPLC SRBS	61	DEACONS KENYA LTD RBS
30	NAMPAK KENYA LTD PF	62	ATLAS COPCO EASTERN AFRICA LTD SPF
31	THE FINLAY KENYA PF	63	TIMSALES PF
32	BARCLAYS BANK OF KENYA LTD SPF	64	JKUA SRBS