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Effect of Corporate Governance, Investment Strategyand Macroeconomic Factors on Financial Performance of Pension Schemes in Kenya

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Abstract: *Pension schemes form a significant part of the global investment portfolio. In Kenya, they hold over 13% of the country's GDP (OECD, 2018). Their importance is underscored by the fact that they contribute significantlyto growth and development of world economies (Kakwani, Davis, 2005; Heijdra, Ligthart & Jency, 2006). Their financial performance is critical to the provision of retirement benefits. Khan, Nouman & Imran (2015) observed that the financial performance indicates measures to which economic goals of an organisation has been accomplished over particular time period. Pension schemes however, face numerous challenges that can render the generation of retirement benefits inadequate.*

A number of studies have been undertaken to evaluate the impact of factors that influence performance of pension funds resulting in mixed and sometimes inconclusive findings. This study sought to assess the effect of corporate governance, investment strategy, interest rate, inflation rate, exchange rate and GDP growth rate on performance of pension funds in Kenya.The study was done using annual data on pension funds and economic indicators spanning the period 1997 to 2018. In addition, it used questionnaires to gather data on corporate governance and investment strategy indices.

Quantitative and correlational research design using Linear regression model was used to assess the effect of corporate governance, investment strategy, interest rate, inflation rates, GDP growth rates and exchange rate on pension performance. The study findings show that these factors had significant impact on pension funding. They however, varied on their individual contribution to the prediction of funding level of each pension fund.

The study concludes that pension fund management and policy makers should take into consideration the effects of macroeconomic factors, corporate governance and investment strategy in decision making on investment plans to ensure generation of adequate funds to fulfill their key objective of providing retirement benefits to the members.

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I. Introduction

1.1 Background of Study

Pension schemes form a significant part of the global investment portfolio. Their importance is underscored by the fact that they contribute significantlyto growth and development of world economies through provision of financial security post retirement, growth of investment, banking and insurance services as well as development of capital markets (Kakwani, Davis, 2005; Heijdra, Ligthart&Jency, 2006; Watson, 2007; Yermo, 2008). In Kenya, pension funds hold over 13% of the country's GDP (OECD, 2018).

The financial performance of some pension funds worldwide has however deteriorated following regional market crisis and large corporate failures such as the Asian financial crisis of late 1997 (Nam & Nam, 2004), the Global financial crisis of 2008 (Antolín & Stewart, 2009),and the tragic collapses and losses of giant companies including the Enron Corporation (2001) in the US, the Bank of Credit and Commerce International (BCCI) (1991) in the UK (Kaur &Suveera, 2009)among others.These events led to major reductions in pension fund assets worldwide (OECD 2008), exacerbating the threat of pension funds failing to provide retirement benefits (Besley & Prat, 2005). In Kenya, similar challenges were witnessed in the past two decades particularly, operational malpractices, misappropriation of scheme funds and lack of transparency. The situation was aggravated by the poor performance of the economy. The relationship between CG and firm value is widely documented particularly in developed countries, but there is a clear gap in academic research in developing countries on this issue.

Governance is progressively acknowledged as critical to the proper functioning of pension plans. A growing body of literature in finance provides evidence on the association between CG practices, corruption,

legal framework and firm performance and value (Ficici&Aybar, 2012; Clark &Urwin, 2008; Moriarty &Zadorozny, 2008). Carmichael and Palacios (2003) argues that good governance practices help to mitigate conflicts among stakeholders in pension funds. Various studies have used several proxies to evaluate the effect of CG rules and practice on business success or failure. Such proxies include board size, board independence, audit committee, CEO duality and scrutiny of managers and executives by various stakeholders which traditionally are not responsible or bothered to take this sort of governance duties (Kacperczyk, 2009). Chow (2005), Yang and Mitchell (2008), and Manuel and Andreas (2008) found positive links between good CG and performance. The findings are based on the theory that an efficient board of directors can significantly reduce agency costs. Other scholars such as Larcker, et al. (2007), Bhagat and Black (2002) and Heracleous (2001) however, found mixed and sometimes inconclusive results on the relations between CG and firm performance. Evidence of the financial effect of CG on pension performance in developing countries is still relatively scarce. Locally, studies focusing on the relationship between CG and stock performance of NSE listed firms established that there is a link between the two factors (Ongore & Kobonyo 2011; Mirig'u 2011; Lishenga 2012). None however, focused on pension funds. Thus, the mixed and sometimes inconclusive empirical literature from developed countries in addition to the limited studies on the subject in developing countries creates a need for further research.

Investment strategy is another key factor that is postulated to affectpension performance. Tonks (2006) affirms that the investmentdecisions promote both the performance and the financial security of pension plan benefits. It is therefore critical that this function is implemented and managed responsibly. This however, was only recentlyrealised following financial crises and large corporate failures that led to decline in pension assets worldwide (Stewart, 2010). Markowitz's (1952) theory of investment in financial assets, the Modern Portfolio Theory (MPT), is key in managing these risks. The theory is concerned with risk and return, based on the mean-variance efficiency for assets allocation. It states that diversification of idiosyncratic risk has a relationship with the expected rates of return on securities. Itthus provides a mechanism to find the optimal combination of securities having minimum variance, the efficient portfolio. The investment environment in the developed world varies from that in the developing countries. A study to evaluate the effect of investment strategy and CG on financial performance of pension funds will therefore extend and strengthen knowledge on the subject from a developing countries perspective.

Macroeconomic factors effect on financial performance of pension assets is a major factor of consideration for long-term investors (Brinson et al., 1991). Ross's (1976) equilibrium Asset Pricing Theory states that the expected security returns is a function of multiple factors. Chen et al. (1986), Flanery and Protopapadakis (2002) and Singh (2010) identified changes in Gross Domestic Product (GDP), inflation, risk premium and exchange rate as well as legal and regulatory environment as the factors that influenced stock market returns. Being major investors in financial assets, pension funds are likely to be affected by these factors, as their financial performance will be determined by portfolio performance. Several study findings affirm that macroeconomic factors influenced stock market returns in the developed world and Emerging Market Economies (Mookerjee & Yu, 1997; Fama & French, 1989; Kwon & Shin, 1999). Other studies, however find that over time the influence of certain macroeconomic factors on financial performance of stock is uneven (Mohammed & Rasheed, 2002; Singh, 2010). Limited studies are available in the country on their effect on pension performance. There are however, local studies involving other sectors showing that interest rates, inflation rates, real GDP influenced stock returns (Olweny & Omondi, 2011; Ochieng & Oriwo, 2012; Osoro, 2015). None was on pension funds.

The study is anchored on the Agency theory of Jensen and Meckling (1976). It will however, be supported three other theories namely the Modern Portfolio Theory (MPT) the Arbitrage Pricing Theory (APT) as well as the Stakeholder Theory (SHT)).The Agency concept postulates that there is a relationship between organizational structure and firms' financial performance. The theory seeks to resolve conflict of interest and agency costs that arise as a result of variation in risk preferences, information failure and shareholders having minimal influence in decision-making in the firm, a role left to the management. Marashdeh (2014) postulated that reduced agency problems raise share value leading to improved performance. The four theories are integrated to develop testable hypotheses that will investigate the relationship between CG, investment strategy, macroeconomic factors and pension financial performance in Kenya.

1.1.1. Corporate Governance

Corporate governance (CG) is described as systems and processes by which an organization accomplishes its undertakings with the goal of mitigating conflicts among its stakeholders and get the best out of their wellbeing (Carmichael & Palacios, 2003). The International Organization of Pension Supervisors (IOPS) refers to pension governance as the framework by which the management makes choices about the pension fund's undertakings. It comprises the configuration of the board; the decision-making processes within the board; the required skills of the board; and the means by which the board is held responsible to shareholders

(IOPS, 2008/9). Chow (2005) argued that a firm's various CG practices shape its behavior and eventually affect its stock market value. Similarly, Shleifer and Vishny (1997) and Watson (2007) affirm that governance has an association with increased investor trust, decline in misappropriation by management,reduces costs of overregulation and improves the economic growth of countries. There are however, no universally accepted CG principals that serve to protect and promote shareholders' assets hence governance principles used across countries vary (Donaldson et.al, 2001). Some common elements underlie good CG including accountability, transparency, rule of law, inclusivity and disclosure(Bhasin, 2013).

The issue of governance is pertinent to pension schemes (Palacios, 2001). It was brought to attention following a wave of regional market crisis and large corporate failures particularlythe Asian Financial crisis of late 1997, the collapse of the Enron Corporation in the US and the Swissfirst affair involving Pensionskassen in Switzerland (Stewart & Yermo, 2008) that resulted in loss of pension assets. Governance regulation serves to reduce possible agency problems of conflict of interest and agency costs that affect negatively the security of pensions. Agency theory depicts management of firms as agents whose interest may diverge from those of the principals, the shareholders where both parties are utility maximizers (Jensen & Meckling, 1976). Thus, given the choice between the two alternatives, the agent or the principal will choose the option that increases his or her individual utility. The primary focus of good CG is in the execution of contracts that get the best out of business performance and lessen risk (Eisenhardt, 1989). The theory thus helps minimize agents from acting inappropriately as well as motivates them to act in the interest of shareholders (David &Impavido, 2003).

It is argued that CG mechanisms and management control effectiveness play significant roles in enhancing financial performance of pension funds.The board of directors has a responsibility of ensuring the implementation of good CG practices (Shleifer &Vishny, 1997). Malik et al., (2016) argues that the relationship between board size and firm value is still a fundamental issue for research aslarge and small board size, both have their own advantages and criticisms. The board size affects the process of monitoring, decision making and disclosure, important functions of the board of directors. Empirical research findingshowever, are mixed across countries and industries, and still it is a matter of research (Yang et al., 2009). The independence of the board in a firm is evaluated by finding the presence of non-executive directors on board (Gallo, 2005). Theyare believed to be more effective monitors who play a significant role in value creation for the firm (Butt & Hassan, 2009). They reduce the conflict of interest between contracting parties and they are expected to act at the best shareholders' interest.

Agency theory's theorists argue that the larger number of non-executives in the board might effectively monitor the top management and protect the shareholders and other stakeholders by ensuring that there is no collusion with top managers to expropriate minorities' wealth. The role of audit committee isto protect the rights of shareholdersand enhance the financial and managerial capabilities of firms (Aanu et al., 2014; Epps & Cereola, 2008).Boards rely on their audit committees to offer effective oversight of the annual auditing process. Audit committees also oversee the system of internal controls and ensure that the company is compliant with laws and regulations. The CEO duality means that the CEO is also holding a position as a Chairman of the board of directors. Yang and Zhao (2014) notes that the separation of post of CEO and the Chairman of the Board is one of the most debatable CG issues in recent years. Strier (2005) identified the CEO duality as a fundamental conflict of interest, having the CEO lead the group that is monitoring his or her performance. No law however, prohibits firms from having one person perform both duties. Empirical study findings on theeffect of CEO duality on firm performance are mixed and inconclusive (Dalton et al. 1998;Wellalage& Locke, 2011).As a result of these inconclusive findings regarding the impact of CG on firm performance, it is worthy to study these variables in new market environment.

Recent developments in the pension industry have made policymakers in many countries attempt to address flaws in governance through varying combination of legal and regulatory instruments, voluntary codes and principals. The Sarbanes Oxley Act (SOX) of 2002 in the USand the Retirement Benefit Authority(RBA) Act Cap 197 of 1997in Kenya were enacted. Besides, the Cadbury Code in the UK, Cromme Code in Germany and the Code of CG in Pakistan and the Mwongozo Code of Governance for State Corporations in Kenya were developed and implemented(Kamran & Shah, 2014; PSC & SCAC, 2015). The SOX Act, together with later regulations main objective was to protect investors from false financial reporting and fraudulent financial practicesand improve the accuracy of their revelations.The RBA Act, Cap 197, put in place CG requirements to be fulfilled by schemes to ensure their smooth functioning (RBA, 2014). CG weaknesses nonetheless, persist worldwide leading to under-performance of a number of pension funds. This raises the question of why governance reforms are not safeguarding pension benefits. Could there be other factors coming into play? Moreover, the dynamics and development of CG in developed economies is different from those in developing countries. Variations in basic legal systems, political stability, market size, corporate ownership and the nature of individual financial systems create the differences in the institutional arrangements between the two (Gul &Tsui, 2004). Evidence of the impact of CG on pension performance in developing countries is still relatively scarce hence the need for further research.

1.1.2. Investment Strategy

Investment strategy refers to a set of rules or guidelines that help investors' select investment portfolios based on investment objectives and tradeoff between risk and return (Bilaus, 2010). It plays a key role in portfolio management. Pension fund management is part of the very large global investment management industry with their assets forming a significant part (Tonks, 2006). The investment process nevertheless, faces many challenges including inflation risks, market, credit, and solvency risks, governance and agency risks, legal and regulatory risks that lead to lower retirement income (Obermann, 2005). This is compounded by the fact that pension schemes unlike other saving vehicles, are long-term in nature under which the savings cannot be accessed until retirement. Managing these risks is therefore key for ensuring their sustainability. Consequently, it is critical that the investment function is managed responsibly.

The type of pension schemes have gradually undergone reform since the early 1980s,moving from defined benefit (DB) systems and unfunded pay-as-you-go systems (PAYG) to arrangements in which the provision of pensions is backed by assets in schemes, which increasingly links retirement incomes to the performance of these assets (Rudolph et al., 2010). This results in participants being exposed to the uncertainties of investment markets that determine the level of benefits that they will ultimately receive. To mitigate the risks, it is argued that there will be need to employ investment management strategies that will provide income replacement at retirement age. In addition, the aging populations has led to the explosion of the liabilities of public PAYG schemes, the implicit pension debt. The movement to funded schemes has therefore been motivated by governments seeking to lessen the fiscal impact of aging populations, diversify the sources of retirement income and mitigate increasingly intergenerational transfers.

The investment strategy is a major approach that serves to manage and control these risks and expected returns (Raz, 2005). The type of strategy adopted depends on short and long-term goals, risks involved along with levels of variability that are acceptable. Pension schemes are unique and therefore there is no one solution that fits all. The strategies employed include asset allocation; active or passive fund management; diversification; limitations on portfolio allocation; market timing; indexing; as well as international investment (Urwin, 2010). The principal theory guiding the selection of assets of a portfolio is the Modern Portfolio Theory (MPT) of Markowitz (1952). The theory is concerned with risk and return and is based on the mean-variance efficiency for assets allocation postulating that diversifiability of idiosyncratic risk is associated with the expected rates of return on securities through optimal portfolio selection. It provides for a mechanism to find the optimal combination of securities having minimum variance.Tonks (2006) notes that there is a link between performance of pension funds and the investment strategy used.

To enhance portfolio management, the OECD issued Guidelines on Pension Fund Asset Management that sets out a basic framework for the regulation of pension fund investment. The guidelines entail setting retirement income objectives and prudential principles; prudent person standards; investment policy; portfolio limits; and valuation criteria of pension assets (OECD, 2006). Sharpe (1992) established that asset allocation accounts for a large part of the variability in the return on a typical investor's portfolio.Elton,GruberandBlake (1996) are of the view that it is possible to outperform the S&P 500. However other researchers such as Sharpe (1991) and Ippolito&Turner (1987) found that actively managed funds on average underperform the index, net the costs. Bogle (2002) shows that the index performs better than the active managed portfolios in most cases.The results support the Efficient Markets Hypothesis (Fama, 1969), which states that asset's prices fully reflect existing information, making it is impossible to beat the market.The mixed findings create a need for further research.Locally, empirical literature is limited on effects of pension fund investment strategy on performance.

1.1.3. Macroeconomic Factors

Macroeconomic factors refer to influential financial, natural, or geopolitical events that broadly affects a regional or national economy, affecting a large population and are uncontrollable and beyond the direct influence and control of the organisation (Brinson et al., 2009). The factors relate to the state of the economy and government policy and include Gross Domestic Product, changes in unemployment, interest and inflation rates, the money supply, natural disasters such as earthquakes as well as fear of civil or international war (Sharan, 2009). The indicators are meticulously observed by investors (Chelangat, 2014). The nature of financial decisions (investment, financing, working capital and dividend), whose ultimate goal is wealth maximization, varies from one firm to the other. The reason is that these decisions are influenced by the prevailing macroeconomic factors among others. Khaparde (2014) concurs that investors select assets in a portfolio based on these factors to achieve portfolio performance that is greater than the market's overall return. Kahraman (2011) affirms that variations on the investment decisions of individual firms are attributed to macroeconomic factors (Liu & Pang, 2009).

Stephen Ross (1976) formulated the Arbitrage Pricing Theory (APT) which states that there is a relationship between financial performance of firms and the macroeconomic variables. The theory offers a

multifactor pricing model for securities and states that the return of securities is a linear function of the macroeconomic variables. Studies by Mookerjee and Yu (1997); Kwon and Shin (1999); Humpe and Macmillian (2007); Bodie et al. (2008); and Pilinkus (2010) in developed countries and EME established that real GDP, industrial production, lagged inflation and interest rate had an impact on stock performance. Olweny and Omondi (2011) and Ochieng and Oriwo (2012) found a significant association between firm performance and the Nairobi Securities Exchange (NSE) index. Locally, limited empirical literature is available.

1.1.4. Financial Performance of Pension Funds

The financial Performance of pension funds refers to a methodology used to determine the level of attainment of the financial objectives of a firm for a particular timeframe(Grabenwarter&Weidig (2005). Similarly, Ijaz and Faizan (2016) describe financial performance as the extent to which an organization's overall financial health over a period of time is measured. It provides information on the business sector outcomes and results for its shareholders to help them in decision making as it indicates how well an entity is utilizing its resources to maximize the shareholders wealth and profitability. Walker and Iglesias (2007) notes that the purpose of measuring portfolio performance is to determine whether portfolio managers add value compared to passive investment strategies represented by feasible and well diversified benchmarks. Fama's (1991) Efficient Markets Hypothesis however, postulates that it is difficult for managers to add value, as asset prices fully reflect all available information hence it is impossible to beat the market consistently on a risk-adjusted basis since.

Performance measurement is key in the effective management of an organization and in enhancement of its processes (Carton, 2004). Kuratko and Morris (2003) observe that business environments have uncertainties that make it trickier to predict and manage factors that can control their performance. Cheema and Din (2013) state that performance can be used to understand CG practices and their contribution in enhancing the total value of companies. They note that pension schemes are under scrutiny by various stakeholders including policymakers, investors and fund trustees with and subject to performance expectations. Performance information enables stakeholders to measure and compare the efficiency of the investment.

A complete evaluation of a firm's financial performance takes into account various kinds of measures but most commonly used in the field of finance and statistical inference are financial ratios particularly, liquidity, solvency, profitability and valuation ratios, trend analysis as well as market value, average annual return and standard deviation (Tapia, 2008a,b; Ijaz &Faizan, 2016). Ratios express the numerical relationship between two or more variables and play an important role in determining the financial strengths and weaknesses of a firm relative to that of other firms in the same industry. The traditional approach to pension funds' performance evaluation uses riskadjustedperformancemeasures including Sharpe's, Sortino's, Treynor's ratios which quantify the ability of pension fund managers to deliver an active management risk premium, with respect to benchmarks. The ratios evaluate fund returns but integrate measure of risk. The study will find the Sharpe's ratio for the various pension funds under study.

Theratioshowshowwellthereturnofaninvestmentcompensatesfortheriskinvestorstake.ThehighertheSharperatiothe betteritcompensatesforrisk.The grading threshold of the ratio will be i) <1 – Not good; ii) 1-1.99 – OK; iii) 2-2.99 – Really good; and iv) >3 – Exceptional(Sharpe, 1966), where Return on assets/portfolio = Net Income ÷ Average total assets.

Sharpe's ratio = $\frac{\text{Return of a portfolio } (R_P) - \text{Risk free rate } (R_F)}{\text{Standard deviation of portfolio's excess return}(\sigma_P)}$

A major drawback with risk-adjusted performance measures is that they exacerbate the herding behaviour around the mean manager. A further potential problem is that the benchmark used for comparison may be inappropriate such as the Market index (Fama & French, 1996).

1.1.5. Pension Schemes in Kenya

A Pension scheme is a retirement income plan that is a legally binding contract with a retirement objective with the benefits being provided upon retirement. The pension plans may offer additional benefits, such as disability, sickness, and survivors' benefits (OECD,2002). The OECD using the multi-pillar approach identified three types of pension schemes:the First pillar, publicly managed pension schemes with defined benefits and pay-as-you-go finance, based on a payroll tax; the second pillar, privately managed pension schemes that are provided as part of an employment contract; and the third pillar, personal pension plans in the form of saving and annuity schemes. Private schemes are managed by fund managers and insurance companies. Pension schemes may further be classified based on two approaches: functional and institutional resulting to plans being either public or private; occupational or personal; Defined Benefit (DB) or Defined Contribution (DC); funded or unfunded.

In Kenya, classification of pension schemes is based on the multi-pillar approach: Pillar I- the Public Service Pension Scheme and the National Social Security fund (NSSF); Pillar II- Occupational pension schemes; and Pillar III-Individual pension plans. A total of 1,268 occupational pension plans and 34 individual

pension schemes exist. Majority of the pension plans have joined 26 Umbrella Retirement Benefits schemes, which pool companies that find it is not financially feasible to create their own pension schemes. Prior to 1997, the industry was largely unregulated and lacked a comprehensive policy framework for fostering sustainable social protection programmes. In 1997 the government restructured the sector to address existing and emerging issues by enacting the Retirement Benefit Authority (RBA) Act Cap 197 that established the RBA whose main function was to oversee the growth and development of the retirement benefits schemes and sector in the country. The financial performance of pension schemes in Kenya nevertheless continued to experience major challenges of operational malpractices, misappropriation of scheme funds and lack of transparency, resulting in declined pension assets. The Kenya Medical Research Institute (KEMRI) pension fund for instance lost KS 295 million held in trust account (Naftali, 2005), whilethe Kenya Ports Authority (KPA) Retirement Benefits Scheme lost KS 700 million in 2018. The events were aggravated by poor performance of the economy. Limited empirical literature is available on the above factors on pension performance,hence the need for further research.

1.2 Research Problem

Regional market crisis and large corporate failures in the past two decades have brought to attention the importance of governance. The 1997 Asian Financial Crisis of the "tiger economies" for instance saw their capital markets and currencies lose 70% of their values (Kuepper, 2019). The Global Financial Crisis of 2008 as well resulted in the great recession (Amadeo, 2019) leading to an estimated loss of US $5.4 trillion or about 20% of the value of pension assets in OECD countries (Antolín & Stewart, 2009). The accounting scandals resulted to a breach of the governance and compliance practices leading to failure of the firms. These events reveal the severity of the agency problem that arises between managers, shareholders and stakeholders that has threatened to erode contributions that pension funds make to the world economies (OECD, 2008; Rudolph et al., 2010). This has exacerbated the threat of pension funds failing to provide retirement benefits (Besley & Prat, 2005). Accordingly, it has put pressure on governments and pension funds to initiate CG reforms to address the problem.

Similarly, challenges of operational malpractices, misappropriation of scheme funds and lack of transparency were witnessed in Kenya, aggravated by poor performance of the economy. The Kenya Medical Research Institute (KEMRI) pension fund lost KS 295 million held in trust account (Naftali, 2005) while the Kenya Ports Authority (KPA) Retirement Benefits Scheme lost KS 700 million through illegal purchase of assets. The challenges persisted despite the enactment of the RBA Act Cap 197 in 1997 that established the RBA that was to provide oversight on the growth and development of the pension sector. A review of existing literature suggests that only a limited number of studies were carried out to evaluate the impact of CG on pension performance (Palacios, 2002). This has led to a fairly fragmented and developing literature in the area, giving a lack of clarity over many concepts. The significance of this study is driven from the importance of the pension sector itself contributing 13% of the GDP.

It is argued that good pension governance is a critical aspect of a well-functioning retirement system as it is posited to determine investment performance and hence security of retirement benefits. Studies by Yang and Mitchell (2005), Manuel and Andreas (2008) and Clark and Urwin (2008) found positive associations between good CG and firm financial performance. Other studies (Daines& Klausner, 2001; Coles, et al., 2008; Bhagat & Black, 2002) found mixed and inconclusive results on the association between CG and pension fund financial performance. Lack of unanimity continues to make the subject a current issue requiring further research to enable a better understanding of the relationship between the study variables and the Agency theory. The theory expounds on the association between the principal, who employs another party, the agent to work on its behalf in an organisation. The agent may not act in the principal's best wishes (Jensen & Meckling, 1976). Due to the varied level of development of capital markets, there is a likelihood of getting different results when studies are carried out in developing economies. This brings to the fore the influence of other factors such as investment strategy and macroeconomic variables. Could they be influencing the above relationship.

Investment strategy is another major factor postulated to influence performance of pension funds. It is an approach to manage and control risksthrough a blend of strategies. It guides an investor's selection of investable assets through a tradeoff between risk and returnas guided by the Markowitz's (1952) Portfolio Theory. The theory provides a framework within which to make sensible asset management and allocation decisions. It proposes that all investors are risk averse and that risk can be reduced by combining dissimilar financial assets to form a diversified investment portfolio. Management of risks was only made wide open by the recent Global economic turmoil's that led to loses in value of pension assets worldwide. Studies in the developed and EME by Mitchell and Hsin (1997); Iglesias and Palacios (2000); and Davis and Hu (2008) established that there is a relationship between good CG, investment approaches and pension performance. Locally however, there is limited empirical literature on the effect of investment strategy on pension performance, leaving a lacuna.

Macroeconomic factors as well are critical consideration by institutional investors when it comes to

assets under management (Brinson et al., 1991). Flanery and Protopapadakis (2002) and Singh (2010) identified macroeconomic factors together with legal and regulatory environment as the variables that influence financial performance of stocks. The Arbitrage Pricing Theory a multi-factor asset pricing model holds that an asset's returns can be forecasted using the linear relationship of an asset's expected returns and the macroeconomic factors implying that the financial performance of pension funds', major investors in stocks in capital markets will be affected by prevailing systematic factors. Studies in the developed world and EME by Fama and French (1989); Mookerjee and Yu (1997); and Kwon and Shin, (1999) affirm that there is a link between stock market return and systemic factors particularly, GDP, interest and inflation rates. Other studies however, found mixed and inconclusive results on the effect of systemic factors on stock returns (Chan et al., 1998; Flannery & Protopapadakis, 2002). The mixed finding provides a need for further research to better understand the relationship between the variables and the APT. Locally, studies on the subject have been few resulting in limited empirical information. Those done tended to focus on other sectors and used different methodologies.Olweny and Omondi (2011), Ochieng and Oriwo (2012) and Osoro (2015) investigated and established that macroeconomic variables influenced stock returns and growth of capital markets in Kenya. Their focus however, was not on pension funds.

The above reviewed empirical literature reveals a number of research gaps. There is little insight relating the performance of pension funds to CG, investment strategy, and macroeconomic variables as multiple factors. There is lack of consensus on why similar CG practices in the developed world produced conflicting and sometimes inconclusive results. Most studies did not take into account the interaction between intervening, moderating and governance structures on pension performance. The studies too neverused the multi-equation approachto assess the influence of multiple factors on pension performance. The focus of this study, to investigate the joint effect of the CG, investment strategy and macroeconomic factors on pension performance. This will help explore the causal relation amongst these factors and shade light on the nature of the relationship from a developing country's perspective. The study thus endeavours to seek solutions to the key study question: How have CG, investment strategy and macroeconomic factors influenced the financial performance of pension funds in Kenya?

1.3 Research Objectives

The main purpose of the study is to assess the level of association between governance, investment strategy, macroeconomic factors and financial performance of pension funds and in the country. Specifically, it will seek to:

i) Examine the influence of corporate governance on financial performance of pension funds.

ii) Establish the effect of investment strategy on the relationship between CG and financial performance of pension funds.

iii) Establish the effect of macroeconomic variables on the relationship between CG and financial performance of pension funds.

iv) Evaluate the joint effect of CG, investment strategy and macroeconomic variables on the financial performance of pension funds.

1.4 Value of the Study

The study outcomes will provide empirical evidence on descriptive statistics on the association between CG, investment strategy, systemic factors and financial performance of pension funds. The findings will link these factors and pension performance in an integrated manner and extend the CG and pension performance discussion. In addition, it will provide evidence from a developing country's perspective on the application of the theories anchoring the study. Both theory and empirical findings will contribute to our understanding of the interplay between research variables and will provide useful knowledge to practitioners, policy makers, trustees and plan members to make sound and effective strategic decisions to achieve superior pension performance. In addition, the study will help bridge the gap between research and practice. Research-based knowledge will lead to greater organizational effectiveness.

CG and the risk management were at the heart of the debate on the 2007-2008 financial meltdown and the large corporate failures. The study therefore will help identify drivers of effective CG and unearth factors that are key to the investment process. The findings will assist investment managers; plan members and beneficiaries make sound and informed investment decisions in asset allocation, portfolio construction and risk management to improve financial performance of pension schemes. Moreover, theresearch findings will be relevant also to the regulators (RBA &CMA) and market participants (NSE). The regulators can use the findings to guide the regulation process. They can also be used to examine critical areas of CG and to formulate necessary policies as guiding frameworks for CG.

Empirical studies on CG in Kenya are limited and therefore it is conceivable that research results will help build academic knowledge in the investment management, systemic factors and pension performance. This

will guide academicians and research institutions in the development of acceptable CG models relevant in the context of a developing economy. Hess and Impavido (2003) opine that knowledge of the CG theory supports the adoption of good CG practices to reduce agency glitches in pension schemes. The applicability of the research theories and models developed in developed countries to that in the context of a developing country such as Kenya will be examined as there exist differences in political, legal, economic, social and cultural settings. The successful use of these theories in this study will contribute towards providing examples of the interpretation of studies from developing countries perspective. Finally, the study will bring to light the importance of the sector to key stakeholders.

II. Literature Review

2.1. Introduction

One area in which dominant ideologies of finance of pension systems converge today is the agreement on the need to ensure financial solvency in larger economic and fiscal matters affecting pension systems. The chapter will review both empirical and theoretical literature on the association between CG, investment strategy, systemic factors and financial performance of pension funds as outlined below.

2.2. Theoretical Foundation of the Study

The founding theory for this research will be the Agency Theory. The study will however be backed three other theories: The Modern Portfolio Theory (MPT), the Stakeholders Theory (SHT) and the Arbitrage Pricing Theory (APT).

2.2.1. The Agency Theory

The Agency theory expounds on the association between the principal, who employs another party, the agent to work on its behalf in an organisation (Jensen &Meckling's, 1976). The agent may not act in the principal's best wishes. The relationship between the two results from the separation of ownership and control which requires protection of shareholders' interests, minimise agency costs and align principal-agents interest (Demsetz& Lehn, 1985). The theory states that rational actors, both agents and principals seek to maximise their individual utility with the least possible expenditure. Given the choice between the two alternatives, the agent or the principal will choose the option that increases his or her individual utility. It is nonetheless difficult for the principals to know ex-ante which agents will self-aggrandise, and so it is prudent for the them to limit potential losses to their utility (Williamson, 1985). The theory therefore aims at reducing agency costs incurred by the principal by imposing internal controls that keep the self-serving agent's behaviour in check. This harmonizes the interests of the managers and the shareholders to maximize company value (Maher & Andersson, 1999). To protect shareholders interests, minimise agency costs and ensure principal-agents interest alignment, agency theorists prescribe various governance mechanisms (alternative executive compensation schemes and governance structures (Demsetz& Lehn, 1985).

The financial incentive schemes provide rewards and punishments that are aimed at aligning principal agents' interests. For governance structures, boards of directors keep potential self-serving managers on check by performing audits and performance evaluations. Outside (non-management) board leadership and membership are desirable to ensure that proper management oversight occurs. The study will examine the relationship between pension performance and governance structures of board size and diversity, CEO duality, presence of director(s) from institutional investors and stakeholder engagement.

Critiques of the Agency theory have however grown with time. Donaldson (1990) and Aguilera et al. (2008) point out its narrow nature that makes it difficult to compare and explain CG practices across different institutional and national context. Equally, Shapiro (2005) critiqued the theory for its narrow analytical focus in the context of shareholders as the only ones with interests in the listed firms. Doucouliagos (1994) argued that labeling all motivation as self-serving does not explain the complexity of human nature. The Stewardship theory argues that shareholder interests are maximised by shared incumbency of these roles. Consequently, managers are not motivated by individual goals but rather are stewards whose motives are aligned by the objectives of the principals (Donaldson & Davis, 1991). A steward's behaviour is such that pro-organisation, collective behaviours have higher utility than individualistic self-serving behaviours hence he/shewill not depart from the interests of his or her organisation. The Agency theory nonetheless is justified in the study as it provides direct relationship between governance and pension performance. It offers a useful way to explain relationships where parties interest are at odds and can be brought into alignment through proper monitoring and well-planned compensation system.

2.2.2. Stakeholder Theory

The Stakeholder Theory (SHT) of CG is about identifying groups who are participants in the corporation that need to be managed (Freeman, 1984 and Aguinis &Glavas, 2011). Stakeholders of a firm

comprise individuals and constituencies with different interests and values that contribute to its wealth creating capacity and activities and who are therefore its potential beneficiaries and or its risk bearers (Preston & Donaldson, 1995; Post et al., 2002).The theory states that, apart from the shareholders, the achievement of a firm has a correlation with other stakeholders who have interest in the firm. It suggests that a wider constituency interests judge firm performance. Since companies are liable to a bigger group of stakeholders other than shareholders, Mayer (1996) is of the view that they should be managed to serve public interest. The theory legitimizes its value as an effective means to improve efficiency and economic success. The theory has both normative instrumental implications (Preston& Donaldson, 1995); Jones & Wicks, 1999). Normative implications mean it has a moral/ethical responsibility to meet the legitimate claims of all stakeholders. Instrumental means it has a profit/wealth enhancing obligation - a means to maximize organizational wealth. Stakeholders should therefore participate in corporate decision-making process as a way of enhancing efficiency to achieve specific goals (Kelly & Parkinson, 1998). The theory therefore is primarily concerned with how CG practices promote the interests of both the shareholders and other stakeholders (Williamson (1985). Health and Norman (2004) nonetheless, critiques the SHT by observing that poor company performance may be justified by management through the use of stakeholder reasons. Blair (1995) too, notes that there is a challenge of attainingfirms' wider objectives.

Pension performance is postulated to have a relationship with the interests of stakeholders. Limited research has however, been undertaken on how to integrate interests of all stakeholders into the scheme's decision making and management processes. Studies already done have investigated whether or not companies that perform well on measures of social performance also perform well on economic measures (Jones, & Wicks, 1999). Others examined the firm's role to satisfy a wider set of stakeholders, not simply the shareowners (Alkhafaji, 1989). In addition, there are those that focused on the perception of the board members regarding their stakeholders or corporate social responsibility (CSR) orientation (Agle et al., 1999; Wieland, 2005) or on the representation of stakeholders on the board of directors (Hillman et al., 2001). Their findings indicate that stakeholder engagement enhances firm performance.Similarly, Demsetzand Lehn (1985) and Wallace and Cravens (1983) established that large US public firms with nomination committees (audit committees, shareholder relation committees)that protect shareholder rights performed better infinancial performance than companies without.Locally, limited empirical studies on the subjectare available.

2.2.3. Modern Portfolio Theory

The Markowitz (1952) Modern Portfolio Theory (MPT), the Efficient Frontier is an investment theory that provides a framework within which to make sensible asset management and allocation decisions. The theory postulates two main concepts: *i)* all investors have a basic objective of attaining maximum returns for any level of risk, ii) risk can be reduced by combining dissimilar financial assets to form a diversified investment portfolio. Risk is categorized into systemic and un-systemic risk.Systematic risks are those inherent in the capital market whereas unsystematic risks are associated with each particular stock as they are company-specific events and risks (Sharpe, 1964; Lintner, 1965). The later are lowered by diversification. The Efficient Frontier, as proposed by the theory is a graphical representation of all possible combinations of risky securities based on the best level of return given a particular level of risk. Investors select their preferred portfolios based on their specific risk predisposition. The theory functions on assumption of investors being risk averse, hence they expect to be rewarded for taking additional risk; are rational; and have access to comparable information. Lately, scholars have critiqued the theory. Studies by Haugen and Heins (1975) and Murphy (1977) established that risk-reward relationship was far weaker than expected. Moreover, the theory's assumptions are incorrect. Gregory (2002) reports that behavioural economists have shown that not all investors act rationally. In addition, all investors are not equally informed, as the market is asymmetrical with information due to insider trading. The theory will be used to evaluate the investment strategies that will help construct portfolios that maximize expected returns and minimize investment risk. Despite these weaknesses, the theory is still applicable in investment management.

Pension plans manage assets that are used to provide workers with a flow of income during their retirement years. Because the plans control the largest pool of capital in the world, asset managers need to be aware of the goals and challenges of managing these plans. Watson (2011) in a study of 13 developed countries, showed that private and public pension plan assets were over US $26 trillion, averaging 76% of gross domestic product (GDP). The investment process of the pension assets is guided by the MPT that rests on the foundation that risk-averse investors can construct portfolios to maximize expected returns based on a certain level of market risk.

A review of studies on the performance of investment funds have revealed mixed results. Studies have been undertaken to evaluate the performance of pension funds on the basis of the economic trade-off between portfolio risk and return. Blake, Lehmann and Timmermann (1999) analyzed a data set on UK pension funds. Their main finding was that strategic asset allocation accounts for most of the ex post variation of UK pension

funds' returns. Other studies established that the vast majority of funds had negative market-timing estimates (Coggin et al., 1993; Daniel, et al. 1997; Blake et al., 1999). Oppolito (1989) looked at mutual fund data and found evidence that is consistent with optimal trading in efficient markets. In contrast, Grinblatt and Titman (1989) looked at mutual fund performance and tests indicated that the risk-adjusted gross returns of some funds were significantly positive. They concluded that risk-adjusted returns in the mutual fund industry, net of fees and expenses, are comparable to returns available in index funds. The findings show that there are those that support market efficiency as well as those that reject it. The later are of the view that investors can apply the MPT to attain an optimal risky portfolio that is fully diversified to achieve a higher return than investing in an index portfolio.This makes the theory relevant to the study. The mixed findings mean that the is need for further research.

2.2.4. The Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) developed by Ross (1976) postulates that there is an association between expected return of a security and a set of systematic factors that affect the assets risks. The theory offers a multi-factor pricing model for securities. The author affirms that diversification of portfolios does not eliminate risks completely as there are economic forces that still influence stock returns. Studies by Chen, 1986; Roll & Ross, 1980 on the model shows that factors such as GDP, changes in inflation and interest rates affect expected stock return.

The main weakness of the theory is on its generality. It fails to explain the theoretical reasons for selecting identified systemic factors as well as their number (Huberman, 2005). Roll (1977) argues that it is difficult to test the theory, as the precise configuration of the market portfolio is not known. Estimation of the model also faces certain challenges relating to methodologies used. Cheng (1996), Günsel and Çukur (2007) established that the number of independent variables used influences the model. In the later two cases, it was found that the applicability of the APT in establishing asset returns may still be valid. The theory will be used to interrogate the association between pension financial performance, CG and systemic factors.

2.3. Empirical Review

The section presents empirical literature outlining the relationship between CG, investment strategy, systemic factors and financial performance of pension funds. The studies are relevant as they provide the empirical relationship of the variables and the applicability of the theories.

1.1.1. Corporate Governance and Pension Performance

Existing empirical literature on CG is mainly from US and OECD firms (Maher & Andersson, 2000). Research finding showed that the financial performance of firms was influenced by the level of shareholder rights and the competence of existing court systems (Gompers et al., 2001; La Porta, et al., 2001; Lombardo &Pagamo, 1998). In particular, they established that enhanced shareholders' rights resulted in higher financial performance of firms. Besley and Prat (2003), Mitchell and Yang (2005), and Manuel and Andreas (2008) found positive relationship between good CG and pension performance. Wagner et al. (1998) found that the probability of firms going under declined with boards controlled by outside directors. Zahra and Pearce (1989) aver that outsiders tend to be objective, unbiased and independent.

Mixed and sometimes inconclusive results on the relations between CG and firm performance were also found by scholars such as Daines and Klausner, 2001 (examined takeover defenses), Larcker, et al. (2007) (examined board and ownership variables) and Coles, et al. (2008) (considered board size). Clarke (2009)observed that CG systems failed to prevent financial crisis and corporate collapses across different economies. Heracleous (2001) reports that researchers failed to find any convincing connection between the best practices in CG and organizational performance. A possible explanation for these results is that there could be other factors influencing the above. Renders et al. (2010) attribute it to the differing and limitation of methods of measuring CG and econometric problems.

Studies on CG of pension funds in Kenya are in the early stages of development and have tended to focus on different sectors. Available empirical evidence is therefore indirect and not related to pension funds. Moreover, different methodologies and variables were used. Mutegi (2014) established that CG structures of occupational retirement benefit schemes in Kenya had a correlation with the financial performance of pension plans. Njuguna (2011) found that good CG practices had a positive correlation with pension regulations, leadership and growth of schemes. None of these studies examined the influence of other factors on the above relationship. Ongore and Kobonyo (2011) assessed the relationship between financial performance of NSE listed firms and governance. They established significant relationships between ownership concentration and profitability of firms. Miring'u (2011) showed that the performance of board members significantly influenced the financial performance of state firms. Lishenga (2012) assessed the effects of board meetings for CG on firm performance and established that improved regularity of board meetings enhanced firm performance. Arising

from these findings, one notes that the focus was on firms and not pension funds. None of the studies too assessed the effect of several factors using a multi-equation approach or a composite measure of CG on pension performance. Further studies are thus required to establish the effect of these factors using a multi-equation approach from a developing countries perspective.

1.1.2. Corporate Governance, Investment Strategy and Pension Performance

The effect of governance on investment decisions in institutional investors, private equity funds and pension funds was undertaken by Khanna and Zyla (2012) in emerging markets (EME). They established that CG was an important factor when making investment decisions and investors were prepared to pay better prices for firms executing good CG practices compared to those poorly governed. The study however, did not investigate the role of trustees in the investment process. In contrast, Useem and Mitchell (2008) showed that CG has no relationship with the financial performance of investing firms. The authors however, showed that governance, influenced the kind of investment strategy used, which had a positive relationship to the financial performance of investments of pension funds. Thus, the financial performance of the funds' investments is indirectly affected by CG.

In Switzerland, Manuel and Christian (2016) investigated the relationship between CG, asset allocation and financial performance of 139 Swiss pension plansundertaking investment opportunities. They established that there is a direct relationship between CG and financial performance of pension plans. The relationship however, is only slight to the category of assets selected. Ambachtsheer, Capelle and Scheibelhut (1998) evaluated the impact of quality of governance structures on financial performance of pension funds undertaking investment opportunities. Their findings showed that the relationship was positive.In Poland, Jackowicz and Kowalewski (2012) showed that there is a positive correlation between the number of outsiders on trustee boards, the level of education, and the market values of the funds. A review of the studies indicates that identifying and understanding the persistence of the poor performance of some fund managers is an important issue despite the fact that the average disguises the fact that some fund managers perform well, and others perform poorly. None of the studies were carried out in developing countries. Furthermore, the level of capital market development varies greatly between the developed and developing countries. This may affect the outcome of the study. Studies carried out too did not take into account the interaction of multiple factors. It is against this backdrop that this study is undertaken to fill the gap.

1.1.3. Corporate Governance, Macroeconomic factors and Pension Performance

Most of the evidence available on studies examining the sources of return variation is indirect and not necessarily related to pension funds but to securities that pension funds invest in. Research in developed countries and EME (Chen,1991, Black et al., 1997; Humpe &Macmillian,2007; Mukherjee & Yu, 1997; Kwon & Shin 1999) showed that real GNP, industrial production, lagged inflation and interest rate influenced stock performance. Muhammad and Rasheed (2002) evaluated the influence of interest rates on stock return for firms in Pakistan, India, Bangladesh and Sri Lanka using monthly data from 1994 to 2000. Their findings indicated a positive relationship between the two variables for firms in Bangladesh and Sri Lanka only. No relationship was however, found for companies in India and Pakistan.

In another study involving the Bombay Stock Exchange (BSE) Sensex, Singh (2010) assessed the impact of exchange rates, industrial production, and wholesale price index on stock return from 1994/95 to 2008/09. The results found were mixed. The three factors had a positive relationship with stock return. However, when the Granger causality test was used to evaluate the findings, index of industrial production was the only factor having bilateral causal relationship with BSE Sensex. The author concluded that in the Indian Capital Market asset's prices fully reflect existing information on exchange and inflation rates. In the Kenyan context, studies by Olweny and Omondi (2011) and Ochieng and Oriwo (2012) found a positive relationship between the Nairobi Securities Exchange All Share Index (NASI), the firm's financial performance, foreign exchange rate, interest rate and inflation rate. Wanjiku (2012) as well found that pension performance was heavily influenced by selected macroeconomic variables. She concluded that in the Kenyan Capital Market, asset prices do not fully reflect existing information. There is therefore need to monitor macroeconomic environment since these changes affect security returns. A review of the existing literature nevertheless reveals that none of the studies investigated used a multifactor model to evaluate the impact of CG, macroeconomic variables and investment strategy on financial performance of pension funds.

1.1.4. Empirical evidence on the joint effect of CG, investment strategy and macroeconomic factors on pension performance

Empirical studies focusing on the effect of multiple factors on the association between CG and pension fund financial performance are limited both in the developed and developing countries. This is a research area that needs attention. Previous studies on the relationship between CG and pension performance attribute the

mixed findings of inconclusiveness or contradictions to the use of two variables at a time (Uwuigbe, 2012). The study will therefore try to address this gap by using a multifactor model to investigate the joint effect of CG, investment strategy, and macroeconomic factors on pension performance.

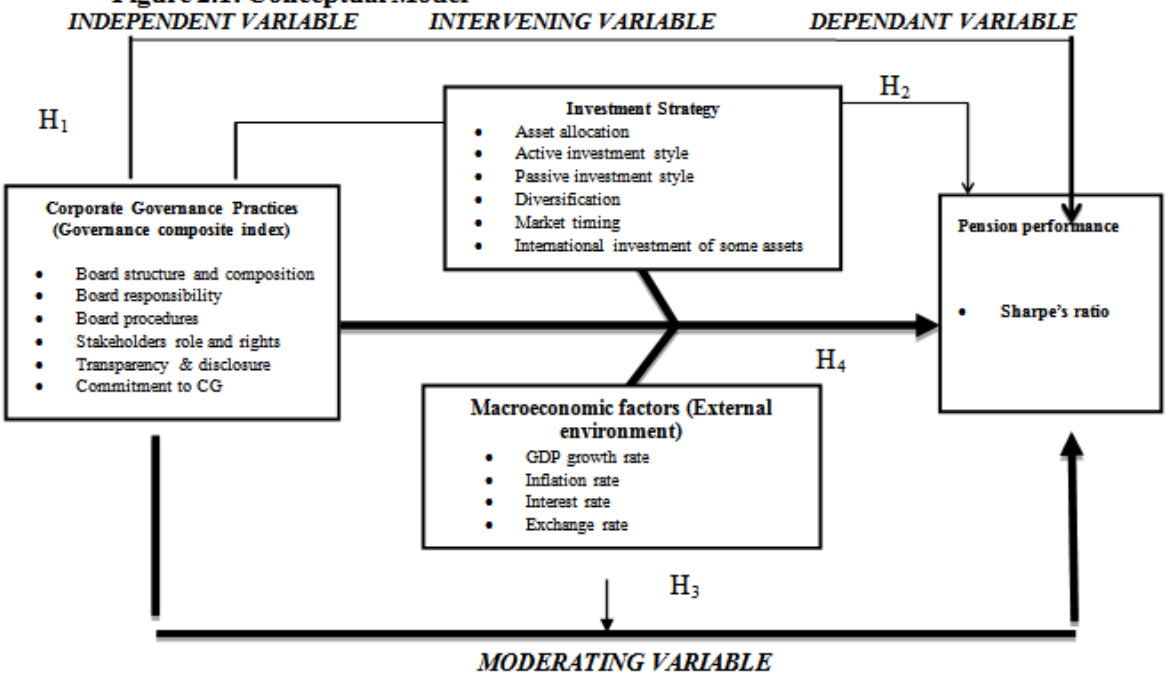
2.4. A Summary of Knowledge Gaps

Table1: A Summary of Knowledge Gaps

Scholar & Year	Area of Focus	Study Analysis Model	Research Findings	Research Gaps	Focus of Current Study
Corporate Governance and Pension Performance					
Manual and Andreas (2008)	Evaluation of the effect of CG on the financial performance of pension funds in Switzerland	Cross sectional survey	Governance practices on organization and target setting had a significant association with the financial performance of pension funds	The study did not consider the effects of intervening or moderating factors on pension performance	Using a multifactor model the research will examine the impact of CG, investment strategy and macroeconomic factors financial performance of pension funds
Fich and Shivdasani (2006); Coles et al. (2008)	Analysis of the consequences of busy boards and assessment of the impact of board sizeon firm performance	ROA	Outcomes yielded mixed findings on the relations, between CG measures and firm performance	Mixed and sometimes inconclusive findings; The studies did not put attention on developing economies	Examine impact of CG practices, investment strategy, institutional characteristic and macro- economic factors on pension performance
Ongare and Kobonyo (2011)	The impact of CG on firm performance on firms listed at the NSE where ownership as a key variable	Survey; ROA ROE	There were significant relationships between ownership concentration and profitability of firms	The study did not consider effects of mediating and moderating factors on firm performance. Focus too was not on pension funds	The study will take into account the effect of interaction of CG, mediating and moderating factors on pension performance
Corporate Governance, Investment Strategy and Pension Performance					
Khanna &Zyla (2012)	The impact of CG on investment decisions in different type of institutions in emerging countries	Survey, ROA	Governance was key when making investment decisions	The study did not consider the effects of mediating and moderating factors on the relationship between CG, investment strategy and pension performance	The study will take into account the interaction of CG, mediating and moderating factors on pension performance
Brinson, Hood and Beebower (1986)	Determinants of Portfolio Performance	ROA Survey	Market timing and stock selection account for only 6% of the variation in returns in a portfolio whereas investment policy accounts for 94%	The study did not investigate the impact of CG, mediating and moderating factors on pension performance	The study will take into account the interaction of CG, moderating factors and investment strategy on pension performance
Corporate Governance, Macroeconomic Factors and Performance of Pension Funds					
Kwon & Shin (1999)	Impact of macroeconomic factors on value of securities measured by stock prices	Survey co-integration test & a Granger causality test	There is an association between Korean Stock price indices and a set of macro-economic variables	The studies did not take into account the interaction of CG, mediating factors and macro-economic factors on firm performance	The study will take into account the interaction of CG and mediating factors on the financial performance of pension funds
Ochieng & Oriwo (2012)	Effect 91 day T-bill and inflation rate on the Nairobi Securities Exchange all share index (NAS)	Autoregressive distributed lag (ARD) bound test approach	There is an association between 91 days T-bill and inflation rate and the NASI	The studies did not consider the effect of CG and Mediating factors on relationship between macroeconomic factors and firm performance	The study will take into account the interaction of CG and mediating factors on the financial performance of pension funds.

***2.5.* Conceptual Framework**

Figure 2.1: Conceptual Model



2.6. Source: Author, 2019

2.7. Hypotheses

The study tested the following hypotheses:

i) **H_1**: CG has a significant relationship with the financial performance of pension plans.

ii) **H_2**: Investment strategy has a significant intervening effect on the relationship between governance and financial performance of pension plans.

iii) **H_3**: Macroeconomic variables have a significant moderating effect on the relationship between governance and financial performance of pension plans.

a) $H_{3(a)}$: GDP growth rate has a significant moderating effect on the association between CG practices and financial performance of pension plans.

b) $H_{3(b)}$: Inflation rate has a significant moderating effect on the relationship between CG practices and financial performance of pension plans.

c) H_{3I}: Interest rate has a significant moderating effect on the relationship between CG practices and financial performance of pension plans.

iv) $H_{3(d)}$: Exchange rate has a significant moderating effect on the relationship between CG practices and fiscal performance of pension plans.

v) H_4: The joint effect of CG, investment strategy and macroeconomic has significant relationship on pension performance.

III. Research Methodology

3.1. Introduction

The section comprises a review of the research procedure that comprises the research philosophy, design, population and sample of the study, data gathering, tests of validity and reliability as well as analysis of data.

3.2. Research Philosophy

Research philosophy refers to a set of beliefs and assumptions that guide the development of new knowledge in a particular area (Saunders, Lewis & Thornhill, 2019). Kuhn (1962) describes it as a system of scientists' beliefs and agreements that enables one to understand problems and find their solutions. The philosophy comprises assumptions that support research strategy and the methods one chooses. It encompasses the concepts of epistemology, ontology and axiology. Epistemology is the study of knowledge acquisition and justified beliefs (Easterby et al., 2008). It entails creation and propagation of knowledge in specific areas of research (Gertler, 2015). Ontology concerns the overall nature of reality and specifies assumptions involved (Gruber, 1995). Axiology refers to the role of values and ethics in research (Heron, 1996).

A research paradigm is an approach to undertake a study (Kuhn, 1962). Guba and Lincoln (1982) refers to it as a basic set of beliefs that guide action in research. Two main paradigms exist: positivism and phenomenological (Sekaran, 2003; Westland, 2004). The authors affirm that positivism relates to the view that involves working with an observable single reality that can be measured and known using quantitative methods to create law like generalizations. The generalizations help explain and predict behaviour and events in organizations. The focus on positivism is on scientific empirical approaches designed to provide unbiased data. It uses present theories to develop hypotheses to be tested and confirmed or refuted. In contrast, phenomenological paradigm assumes that people differ physical phenomena as they interpreter issues (Saunders et al., 2018). To get those multiple realities, they use qualitative methods of observation, questioning and description (Crotty, 1998). Since the study seeks to test quantitative hypotheses, a positivistic research approach will be used.

3.3. Research Design

Research design is described as a main plan for the for the collection, measurement, and analysis of datato address a research problem (Zikmund, 2003). It is the global strategy selected to incorporate the various sections of the study in a clear and systematic way to address the research problem (Trochim, 2006). It is the overall strategy one chooses to integrate the different components of the study in a coherent and logical way to address the research problem (Trochim, 2006). Creswell (2008) identifies three research designs: qualitative, quantitative, or mixed methods. The study used both quantitative and qualitative research designs.The qualitative research design of in-depth interview will be used to assess both the impact of CG structures and investment strategies on financial performance of pension schemes. They examine about persons and the reason behind the thinking through collection of no-numeric data.The design is more descriptive and is used to draw inferences. It involves five methodologies: content analysis, in-depth interview, focus groups,ethnographic and case study research. The in-depth interview involved survey questionnaires, interviews and documentation review (Neuman, 2006). Both the CG index and investment strategy index were estimated using this method.

Quantitative research designs asses the level of association between study variables using statistical analysis techniques (Creswell, 2013). They are classified as descriptive, correlational, quasi-experimental and experimental research designs, observing and describing the behavior of a subject without influencing it in any way.Descriptive research describes the characteristics of the population or phenomenon that is being studied focusing more on the "what" of the research subject rather than the "why" aspect. It describes a subject population's critical variables that will provide answers to the questions of who, what, when, where, and how related with a specific study problem (Cooper & Schindler, 2003). The design involves three methods in data collection: observational, case study methods as well as survey research. This design is used when one wants to define respondent characteristics, measure data trends, conduct comparisons and validate existing conditions.

Correlation studieson the other hand are where a researcher investigates associations between variables and none of the variables are manipulated (Waters, 2017). Developmental studies evaluate changes over time. The study used descriptive, correlational, survey and developmental quantitative research designs to assess the relationship between financial performance of pension funds and the variables CG structures, investment strategy, interest, exchange and inflation rates and change in Gross Domestic Product (GDP). The study wasalso longitudinal as sample members were measured repeatedly over time. The quantitative data collected included performancemeasurements of pension funds, NSE 20 share index, exchange, inflation and interest rates, changes in GDP.

3.4. Population of the Study

Population of a study is described as the entire set of subjects (people, objects, events, or measurements) that have similar characteristics (Mugenda & Mugenda, 2003). Polit and Hungler (1999) defined it as the entirety of all the subjects that fit certain qualifications. The research population comprises 1306 public and private pension funds registered with the RBA as at 31st December 2018 organised as either individual or umbrella pension schemes (Appendix III and IV). The unit of analysis was each of the individual or umbrella pension schemes or targeted fund managers from these pension schemes.

1.1.1. Sample of the Study

A sample is a subsection of a population carefully chosen to take part in the study (Brink, 1996; Polit & Hungler 1999:227). LoBiondo-Wood and Haber (1998) refers to sampling as the method of selecting part of the population to represent the entire set of subjects.To produce results that can be generalized to the population, random sampling method was applied. Sample size was estimated using Cochran's sample size formula (1963:75):

$$\mathbf{n_0 = Z^2pq/ e^2}.$$

Where n_0 is the sample size; Z^2 is the critical value of the Normal distribution at α/2, for example Z= 1.96 for a confidence level of 95%, α is 0.05; e is the required accuracy level; p is the sample fraction with a characteristic; and N is the entire set of subjects. The selection of the period of study is informed by the fact that major CG reforms were effected during that time, providing a scope to evaluate the influence of CG as well as investment strategy and macroeconomic factors on pension fund financial performance. Size of the sample for the studywas 297 estimated:

$$\mathbf{n = Z^2*N*\partial_p/\{(N-1) * e^2 + (Z^2*\partial^2_p)\}\ n=1.96^2*1306*0.5^2/\{(1306-1)\ 0.05^2+(1.96^2*0.5^2)\}}$$

Where; N=1306, the population size; e= 0.05, margin of error; $\partial p = 0.5$, the standard deviation of the population; and Z = 1.96 at 95% confidence level.

3.5. Data Collection

Data used in the study comprised both primary and secondary sources entailing time series and cross-sectional data covering the years 1997-2018, the time when major pension regulatory reforms were undertaken in sector. Data was derived from several sources. Quantitative data on monthly value of pension assets and their returns was obtained from individual pension funds records, annual reports or archives. Market surveys, annual reports and publications from the Central Bank of Kenya and the Kenya National Bureau of Statistics provided quantitative data on GDP, inflation and foreign exchange rates while the Capital Markets Authority provided NSE 20 share index, corporate bond and T- bill rates. Primary data comprising CG and investment strategy index was obtained after analysis of qualitative data collected using survey questionnaires from the pension schemes. The respondents for the questionnaires included elected members of the schemes' trustee sponsor, elected trustee, corporate trustee scheme administrator, scheme manager, custodian actuary and any other person with knowledge on the institution.

3.6. Tests for Reliability and Validity

3.6.1. Tests of Reliability

Reliability is "the degree of consistency with which the instrument measures an attribute" (Polit & Hungler 1999:255). De Vos (1998) describes it as the level to which the use of a specific research tool in another study, yields equivalent outcomes under similar settings. Cronbach (1951) referred to it as how closely related a set of items are as a group. All the definitions embody the concept of repeatability or replicability of research findings. Joppe (2000) avers that the research instrument is reliable if the study findings can be reproduced under a comparablecondition. Reliability therefore is about the precision of the actual measuring research instrument or procedure and is estimated using Cronbach's Alpha Coefficient. The coefficient ranges from 0-1. If all items are not correlated, then $\alpha = 0$; and, if all of the items have high covariances, with α approaching 1, they probably measure the same underlying concept.For this study, the Test re-test approach was used to evaluate the reliability of the two sets of questionnaires of CG and investment strategy. The questionnaires was administered and later repeated over a period of time to management personnel of several independent pension funds.The findings from Time 1 and 2 werethen evaluated to see if there wasany association over time.

3.6.2. Tests of Validity

Validity is a test that measures the extent to which study scores represent what it is purported to measure (Wren, 2006). It determines how truthful the research results are and is measured by the presence or absence of systemic error of data (Campbell & Stanley, 1963).

3.6.3. Diagnostic tests

Model diagnostics is concerned with testing the goodness of fit of a model and, if the fit is poor, suggesting appropriate modifications. The tests are applied to evaluate model residuals, which also serveastests of modeladequacy. They are designed to examine the dependence (correlation) structure of a time series. If a time series is serially uncorrelated, no linear function of the lagged variables can account for the behavior of the current variable. They include Multicollinearity tests and the Heteroscedasticity tests.

3.6.4. Multicollinearity

Multicollinearity occurs when the explanatory variables are very highly correlated with each other in a model. Its presence can adversely affect the regression results: i) R^2 will be high but the individual coefficients will have high standard errors; ii) The regression becomes very sensitive to small changes in the specification; iii) The confidence intervals for the parameters will be very wide, and significance tests might therefore give inappropriate conclusions.Detecting multicollinearity is through calculation of correlation coefficients for all pairs of predictor variables. If the correlation coefficient, r, is exactly +1 or -1, this is called perfect

multicollinearity. If r is close to or exactly -1 or +1, one of the variables should be removed from the model if at all possible.

Multicollinearity is also determined by the analysis of correlations between the variables and the variance inflation factor (VIF) values (Taylor, 1990). The VIF estimates how much the variance of a regression coefficient is inflated due to multicollinearity in the model. For the correlation coefficient, the range of values from 0.68 to 1 is considered which was specified by Taylor in 1990 and accepted by many researchers as an indicator of the strong correlation between the variables. As the VIF value, 4 is decided out of the values from 4, 5 and 10 which are accepted by the most researchers as indicators of upper limit that there is no multicollinearity problem (O'Brien, 2007; Farrar et al., 1967; Wichers, 1975). Detection-tolerance or the Variance Inflation Factor (VIF) for multicollinearity:

$$\textbf{Tolerance= } 1\text{-}R_j^2\textbf{; VIF = 1/tolerance}$$

where R_j^2 is the coefficient of determination of a regression of explanator j on all the other explanators. A tolerance of less than 0.20 or 0.10 and/or a VIF of 5 or 10 and above indicates a multicollinearity.

3.6.5. Heteroscedasticity

Heteroscedasticity occurs when the variance of the errors varies across observations. If the errors are heteroscedastic, the OLS estimator remains unbiased, but becomes inefficient. More importantly, estimates of the standard errors are inconsistent. The estimated standard errors can be either too large or too small, in either case resulting in incorrect inferences. Given that heteroscedasticity is a common problem in cross-sectional data analysis, methods that correct for heteroscedasticity are important for prudent data analysis. The assumption of homoscedasticity (meaning "same variance") is central to linear regression models. Heteroscedasticity is present when the size of the error term differs across values of an independent variable. Tests for Heteroskedastic disturbances in a linear regression model is developed using the framework of the Lagrangian multiplier test of Aitchison and Silvey (1960). It tests for the effect of the first order conditions for a maximum likelihood of imposing the hypotheses.n statistics, maximum likelihood estimation (MLE) is a method of estimating the parameters of a statistical model given observations, by finding the parameter values that maximize the likelihood of making the observations given the parameters

3.7. Operationalization of Study Variables

The study variables wereoperationalized as per the previous studies as indicated below. The CG scores will be calculated using multifactor indexes such as those used in prior studies of Bhagat *et al.* 2008; Bebchuk *et al.* 2009; Daines*et al.* (2010). The index will comprise eight sections. High scores for the index denote quality CG and vice versa.

Table 3.1: Operationalization of Study Variables

Variable category & name	Indicator	Operational definition	Measurement	Nature of variable	Supporting evidence from literature
Dependent- Pension fund performance	Sharpe's ratio: Excess Return to Variability	Composite measure of performance, where: S_t = the Sharpes index, R_p = the annually average return on portfolio, R_f = the risk free rate ∂_p = the standard deviation of the return of the portfolio	$S_t = \frac{R_p - R_f}{\partial_p}$	Ratio	Sharpe (1964)
	Pension fund value	Actual annual return of the fund assets, net or gross		Continuous	
Independent –CG composite index	Board structure & composition	Ownership and shareholding (Outside ownership)	CG sub index 1	Continuous	Shleifer, A., R. Vishny (1997);
		Board size: number of trustees	CG sub index 2		
		Board independence: percentage of outsiders in the board	CG sub index 3		Carvalhal da Silva (2005)
		Independence of the chairman: if outsider or if insider (CEO's duality)	CG sub index 4		Carter et al., 2003
		Board diversity: measured by gender, nationality, age,	CG sub index 5		Masulis et al., 1999
	Management practices	Commitment to CG- code of ethics	CG sub index 8		OECD (2005); Conyon& Peck (1998)
		Board procedures			
		Audit committees			
		Remuneration of directors			

Variable category & name	Indicator	Operational definition	Measurement	Nature of variable	Supporting evidence from literature
	Transparency and disclosure	Certified annual financial statements, audited and unaudited.	CG sub index 9		Menon & Schwartz, (1986); OECD. (2005)
	Shareholders' right	Protection and equitable treatment of minority shareholders	CG sub index 6		Carvalhal da Silva (2005)
		Established Legal and mutual rights of stakeholders	CG sub index 7		Carter et al., 2003
Intervening - Investment strategy	Asset allocation policy	Composite measure evaluated by whether application of the investment strategies is undertaken	Investment Strategy index		Feldestein (1983) Humpe & Macmillan (2007)
	International diversification				
	Market timing,				
	Portfolio selection,				
	Restrictions on portfolio performance				
Moderating - Macroeconomic factors	Gross Domestic Products (GDP)	Annual growth rate of the GDP		Continuous	Humpe & Macmillan (2007)
	Inflation rate	A general increase in prices of most goods and services measured monthly	Consumer Price Index	Continuous	Olweny & Omondi (2011)
	Interest rate	The price paid by individual or business to borrow money measured daily	% of the shilling borrowed	Continuous	Feldestein (1983)
	Exchange rate	The rate at which one currency will be traded for another, measured daily	Price	Continuous	Kane & Marcus, 2008

3.8. Data Analysis

The unit of analysis was individual pension funds. Data wasanalysed in two stages. First there was descriptive analysis that entailed computations of frequency distributions, mean scores, standard deviations and coefficient of variation of the fund assets value, ROA, ROE and the volatility of gross real return of the pension funds. Secondly, the analysis involved testing for relationships between and among variables to establish their nature and magnitude. This nvolved multiple regression analyses, Pearson's product moment and analysis of variance (Baron & Kenny, 1986) for the model:

$$\textbf{Pension Financial Performance} = \alpha + \beta_1 CG + \beta_2 IS + \beta_4 MF + e.$$

Where CG = Corporate Governance; IS = Investment Strategy; MF = Macroeconomic factors;e = error term. The following are the regression models and the hypotheses to be tested.

Table 3.2: Study Hypotheses and Analytical Models
Summary of Analytical Models

Objectives	Hypothesis	Analytical Model	Interpretation
Determine the influence of Corporate Governance (CG) on pension performance	H_A: CG practices significantly influence the performance of pension plans in Kenya. H_0: $\beta_n = 0$ H_A: $\beta_n \neq 0$	Simple regression analysis, where Pension performance =f (CG) $Y = \alpha + \beta nXn + e$ Where Y= Mean score of the Sharpe's ratio α=Intercept/constant β_n = regression coefficient (Beta) X= Aggregate mean score of the CG ε = error term Pearson's product moment correlation R	Pearson's product moment correlation coefficient (R) determination - The model establishes that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R^2). Range = +1 to -1 R= $\geq$ 0.7 indicates a strong positive relationship. Range = $\leq$ 0.3 indicates a weak relationship
Establish the mediating effect (Me) of investment Strategy (IS) on the relationship between CG (X) and pension	**H_2**: The investment strategy does not mediate the effect of CG practices on performance of pension plans in	Path analysis/Stepwise regression analysis: a statistical method of testing cause/effect relationships. Step 1: $Y = \alpha_0 + \beta_1 X_1 + \varepsilon$ Step 2: $Me = \alpha_0 + \beta_1 X_1 + \varepsilon$	Step 1-3 establishes whether zero order relationship among the variables exists. If one or more of these relations are not significant, then mediation is not possible. But if significant proceed to step 4. Full mediation is supported if CG is no

Objectives	Hypothesis	Analytical Model	Interpretation
performance (Y)	Kenya. .	Step 3: $Y=\alpha_0 + \beta_2 Me + \varepsilon$ Step 4: $Y= \alpha_0 + \beta_2 Me + \beta_1 X_1 + \varepsilon$ Where Y= composite score for financial performance α_0=regression constant X= composite score for CG Me=mediating factor-composite score for IS Pearson's product moment correlation R	longer significant when IS/IC is controlled Partial mediation is supported if both CG and IS/IC significantly predict pension performance. R^2 to assess how much change in financial performance is due to CG and IS or IC If R is > 0.7 there is a positive relationship and below 0.5 there is a weak relationship.
Asses the moderating effect of macroeconomic factors on the relationship between CG performance of pension funds	H_A: The influence of CG on performance of pension funds is significantly moderated by macroeconomic factors. H_0: $\beta_n = 0$ H_A: $\beta_n \neq 0$	Regression analysis $Y= \alpha_0 + \beta_1 X_1 + \varepsilon$ $Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2$ $Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_{1\text{-}p} X_{1\text{-}p}.Z_{1\text{-}p} + \varepsilon_i$ Where: Y_1= Sharpe's ratio α_0 = regression coefficient and intercept $\alpha_{1\text{-}p}$ = Regression coefficient s or change induced in Y by each independent variable X $X_{1\text{-}p}$=independent variable $Z_{1\text{-}p}$ = moderator if the relationship between X and Y is a function of the level of Z The coefficient ($\alpha_{1\text{-}p}$) of the moderating and independent variables indicate the magnitude of the respective relationship between that variable and the first dependent variable. Pearson's product moment correlation R	H_0: $\beta_{1\text{-}p} = 0$ H_A: $\beta_{1\text{-}p} \neq 0$ To conduct test a t test to determine individual significance of the relationship To conduct an F test (AOV test) to assess overall robustness and significance of the simple regression model. -Reject H_0 if p value $\leq \alpha$, otherwise fail to reject H_0 if p-value is $>\alpha$ Pearson's product moment correlation coeffiInt (r) The model establishes that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R^2). Range = +1 to -1 R= ≥ 0.7 indicates a strong positive relationship. Range = ≤ 0.3 indicates a weak relationship
To determine whether the joint effect of CG, IS, & macroeconomic factors on pension performance is greater than the individual effect of CG on pension performance in Kenya.	The joint effect of CG, IS and macroeconomic factors is greater than the individual effect of CG on pension performance in Kenya significantly affects the performance of pension funds in Kenya.	$Y = \alpha_0 + \beta_1 X_1 + \beta_{1\text{-}p} X_{1\text{-}p}.Z_{1\text{-}p} + \beta_n \text{ Men} + \varepsilon_i$ Where: Y= Sharpe's ratio α_0 = regression coefficient and intercept β_1 = Regression coefficient or change induced in Y by each independent variable X X_1=independent variable $X_{1\text{-}p}$=independent variable $Z_{1\text{-}p}$ = moderator if the relationship between X and Y is a function of the level of Z Men= mediating variable if the relationship between X and Y is a function of the level of Xnjn ε_i = error term Pearson's product moment correlation R	H_0: $\beta_1 = \beta_2 \ldots = \beta_n = 0$ There is no linear relationship between Y and the set of independent variables H_A: At least one of $\beta n \neq 0$ (There is a linear relationship between Y and the set of independent variables) To conduct a t test to determine individual significance of each parameter To conduct an F test (AOV test) to assess overall robustness and significance of the multiple regression model. Reject H_0 if p value $\leq \alpha$, otherwise fail to reject H_0 if p-value is $>\alpha$ If $r > 0.7$ with a positive β and $p<0.05$ it indicates CG has a positive and significant effect on pension performance.

Source: Author (2019)

IV. Research Findings

4.1. Introduction

The chapter presents study findings from the data analysis done to determine the relationship between seven predictive factors namely corporate governance, investment strategy, macroeconomic factors (GDP growth rate, Average interest rate and Inflation rate), the NSE 20 share index, Exchange rate and the financial performance of pension funds in Kenya. Four hypotheses were tested: *i)* CG has a significant relationship with the financial performance of pension plans; *ii)* Investment strategy has a significant intervening effect on the relationship between governance and financial performance of pension plans; *iii)* Macroeconomic variables (GDP growth rate, Inflation rate, Interest rate and Exchange rate have a significant moderating effect on the relationship between governance and financial performance of pension plans; and *iv)* the joint effect of CG, IS, & macroeconomic factors on pension performance is greater than the individual effect of CG on pension performance in Kenya.Theresearch period covered the years 1997-2018 and data was obtained from industry.

4.2. Test of assumptions

The regression was done with no violation of the assumption of normality, linearity, multicollinearity, heteroscedasticity, homoscedasticity, outliers and independence of residuals.

Table 1: Correlational for the main variables (Independent variables)

		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1.	GDP growth rate	***									
2.	Inflation rate	(0.2802)	***								
3.	NSE 20 share		0.388								
index		0.4944*	9	***							
4.	Maketcapitalizatio	0.5426*	0.282	0.8592*							
n		*	0	**	***						
5.	Exchange rate Ksh		(0.269								
US/KS		0.4549*	1)	0.1511	0.1767	***					
6.	Equity Market	0.5749*	0.285	0.9030*	0.6824*						
Index		*	6	**	**	0.2264	***				
			(0.248			0.9785**	0.151				
7.	Exchange rate	0.4001	9)	0.1011	0.1452	*	4	***			
8.	Average interest	(0.5529)	(0.187	(0.4261	(0.5467)	(0.5538)*	(0.371				
rate		**	4)	)*	**	*	1)	(0.5173)*	***		
			0.368	(0.2224		(0.7810)	(0.345	(0.7689)*	0.21		
9.	CG INDEX	(0.3819)	7	)	(0.1668)	***	9)	**	85	***	
			0.354	(0.2278		(0.7963)	(0.354	(0.7809)*	0.20	0.9920*	**
10.	IS INDEX	(0.3666)	7	)	(0.1588)	***	1)	**	83	**	*

NOTE: N=22. *P<.05, **P<.01, ***P<.001, two tailed.

Correlation coefficient indicates the strength of the relationship between the variables. Pearson's coefficient (r) >0.8 or > 0.9 indicate multicollinearity. The findings show that the NSE 20 share index is highly correlated to Maket capitalisation (r=.859) and Equity Market Index (r=.903). Thus, the Maket capitalisation and Equity Market Index were excluded in the regression analysis. **Critical value calculator**: The corresponding critical correlation values r_c for a significance level of α=.05; α=.01 and α=.001, for a two-tailed test are: .05=.423; .01=.537: and .001=.652. The null hypothesis is rejected if $|r|>r_c$. Correlations greater that .433. are statistically significant (p<.05).

Table 2: Macroeconomic variables, CG index and IS index

Year	GDP growth rate	Inflation rate	Average interest rate	NSE 20 share index	Exchange rate Ksh to US	Respondent	CG INDEX	IS INDEX
1997	0.48%	12.10%	22.63%	3,345	55.40	001	5.1034	5.3462
1998	3.29%	5.61%	23.23%	2,954	61.00	002	5.4483	5.4615
1999	2.31%	4.98%	16.76%	2,348	69.77	003	4.6552	4.7308
2000	0.60%	7.77%	16.59%	2,090	74.10	004	5.0345	4.9404
2001	3.78%	5.82%	14.70%	1,439	77.00	005	5.1724	5.4231
2002	0.55%	2.16%	13.69%	1,512	78.67	006	5.5000	5.8846
2003	2.90%	5.98%	11.49%	3,111	77.60	007	4.1724	4.7692
2004	5.13%	8.38%	8.44%	3,037	76.93	008	3.8276	4.6154
2005	5.90%	7.82%	9.25%	3,952	77.47	009	5.4138	5.4615
2006	6.47%	6.04%	9.45%	5,733	71.87	010	4.9655	5.2692
2007	6.85%	4.27%	9.55%	4,795	66.60	011	4.5517	5.2308
2008	0.23%	15.10%	9.75%	4,731	69.97	012	5.3103	5.0556
2009	3.31%	10.55%	10.19%	3,429	77.40	013	5.7931	5.3077
2010	8.40%	4.31%	10.00%	4,411	79.13	014	5.0714	4.9231
2011	6.10%	14.02%	10.44%	3,184	85.57	015	5.3448	5.2692
2012	4.56%	9.38%	13.70%	4,197	88.83	016	4.9655	5.2692
2013	5.88%	5.72%	12.02%	4,880	85.27	017	-	-
2014	5.36%	6.88%	11.48%	5,115	86.68	018	-	-
2015	5.72%	6.58%	11.33%	3,941	91.32	019	-	-
2016	5.88%	6.32%	12.03%	3,173	102.08	020	-	-
2017	4.86%	7.99%	11.15%	3,717	102.45	021	-	-
2018	6.00%	4.69%	11.00%	2,768	102.37	022	-	-

Source: KNBS 2018

Table 3: Descriptive statistics of macroeconomic variables, corporate governance and investment strategy indices

Variable		Mean	Standard Error	Median	Standard Deviation	Sample Variance	Range	Minimum	Maximum	Obs
1.	**GDP growth**									
rate		0.0448	0.0048	0.0513	0.0221	0.0005	0.0817	0.0023	0.0840	21
2.	**Inflation rate**	0.0716	0.0068	0.0632	0.0310	0.0010	0.1294	0.0216	0.1510	21
3.	**NSE 20 share**					1,366,50				
index		3,548	255	3,429	1,169	9	4,294	1,439	5,733	21

4.	**Exchange rate Ksh to US**	81.05	2.52	77.60	11.54	133.25	41.45	61.00	102.45	21
5.	**Average interest rate**	0.1220	0.0074	0.1133	0.0341	0.0012	0.1479	0.0844	0.2323	21
6.	**CG INDEX**	3.5822	0.5156	4.9655	2.3630	5.5836	5.7931	0	5.7931	21
7.	**IS INDEX**	3.6958	0.5263	4.9404	2.4116	5.8159	5.8846	0	5.8846	21

Figure 1: Trends in macroeconomic variables

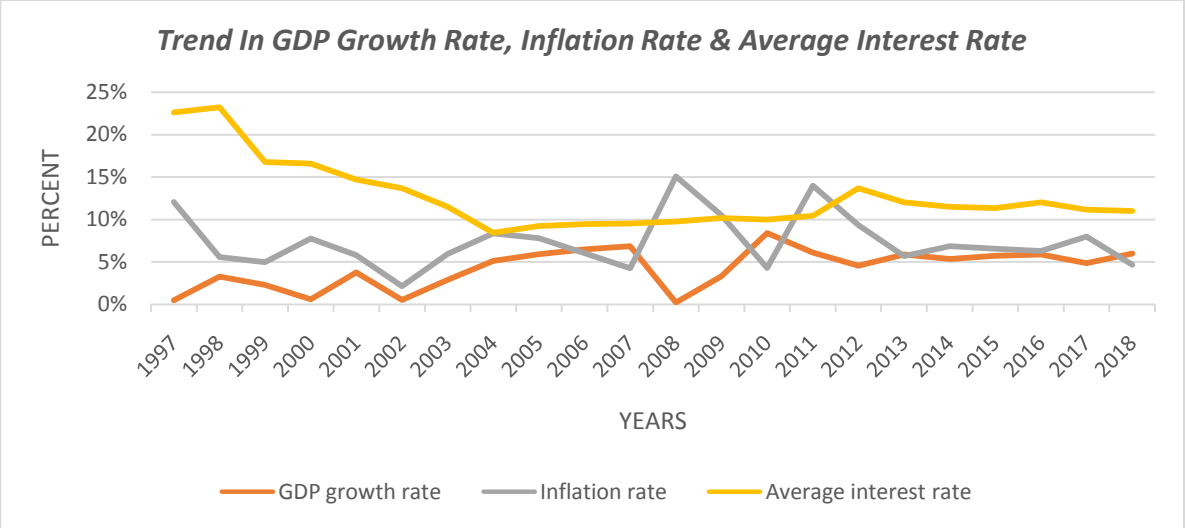
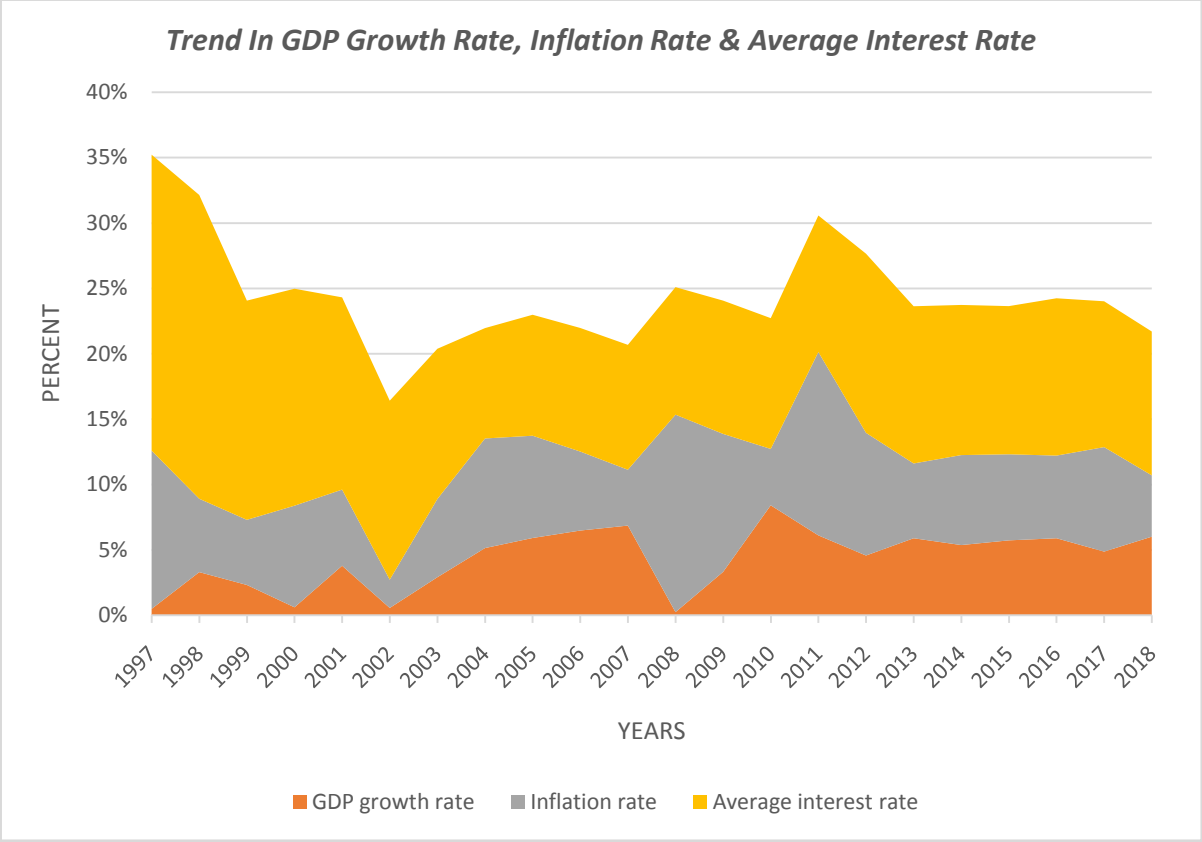
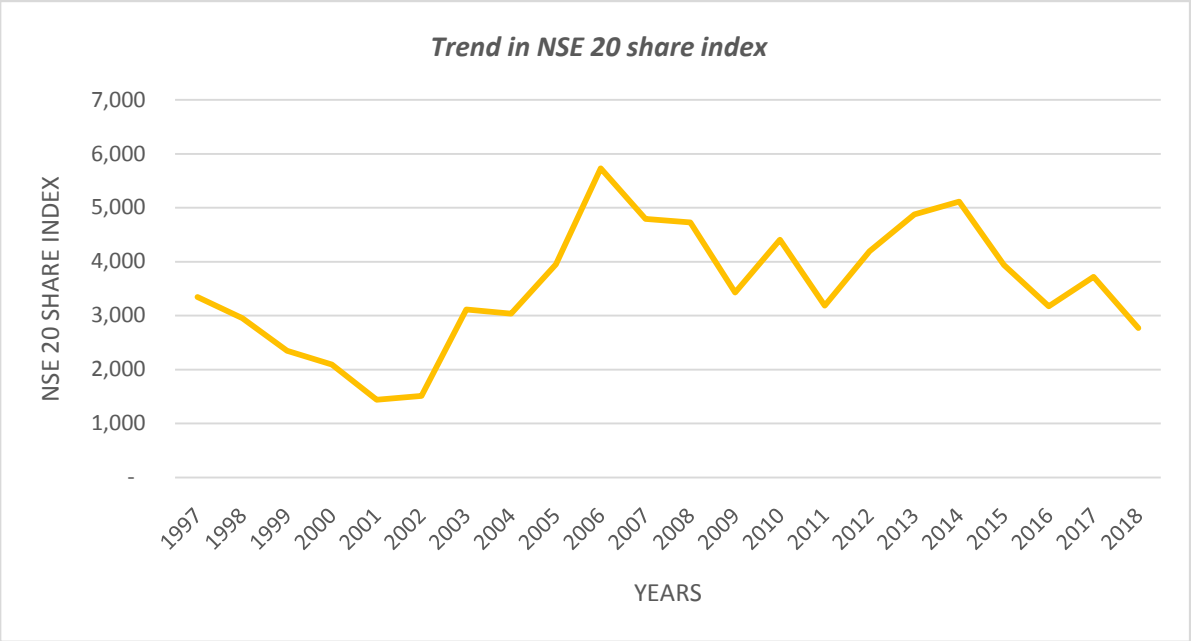


Figure 2: Trend in GDP growth rate , Inflation rate and Average interest rate



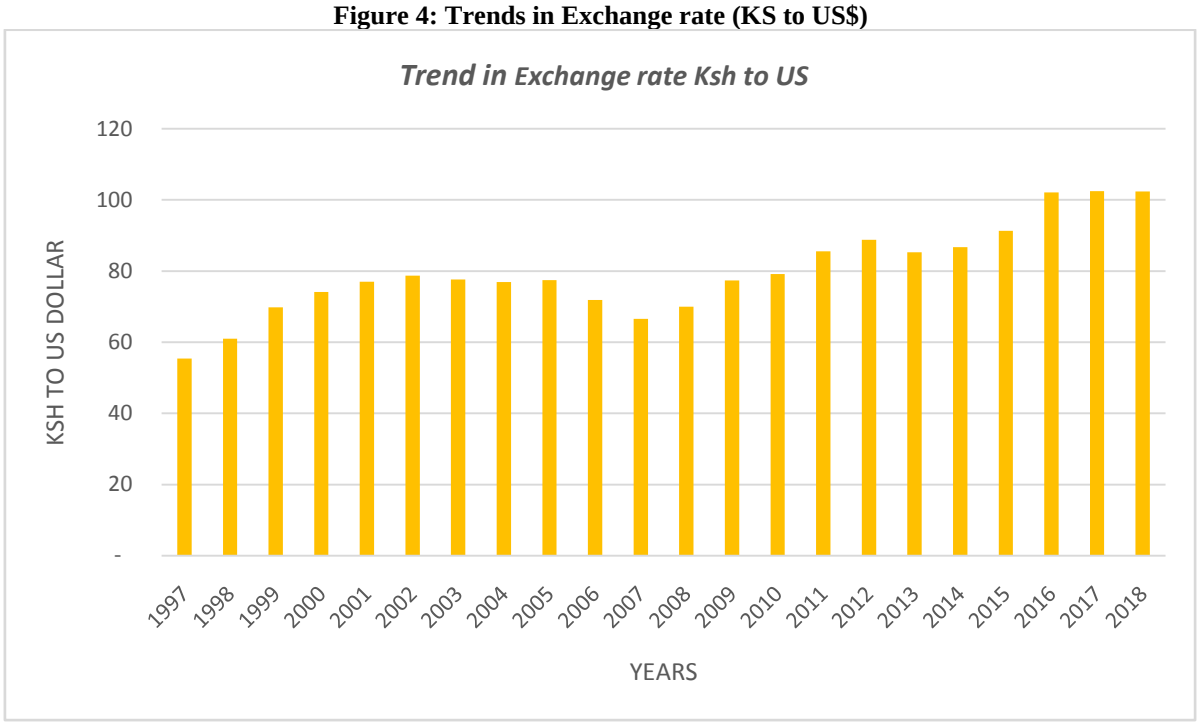
Source: KNBS 2018

Figure 3: Trends in NSE 20 share index



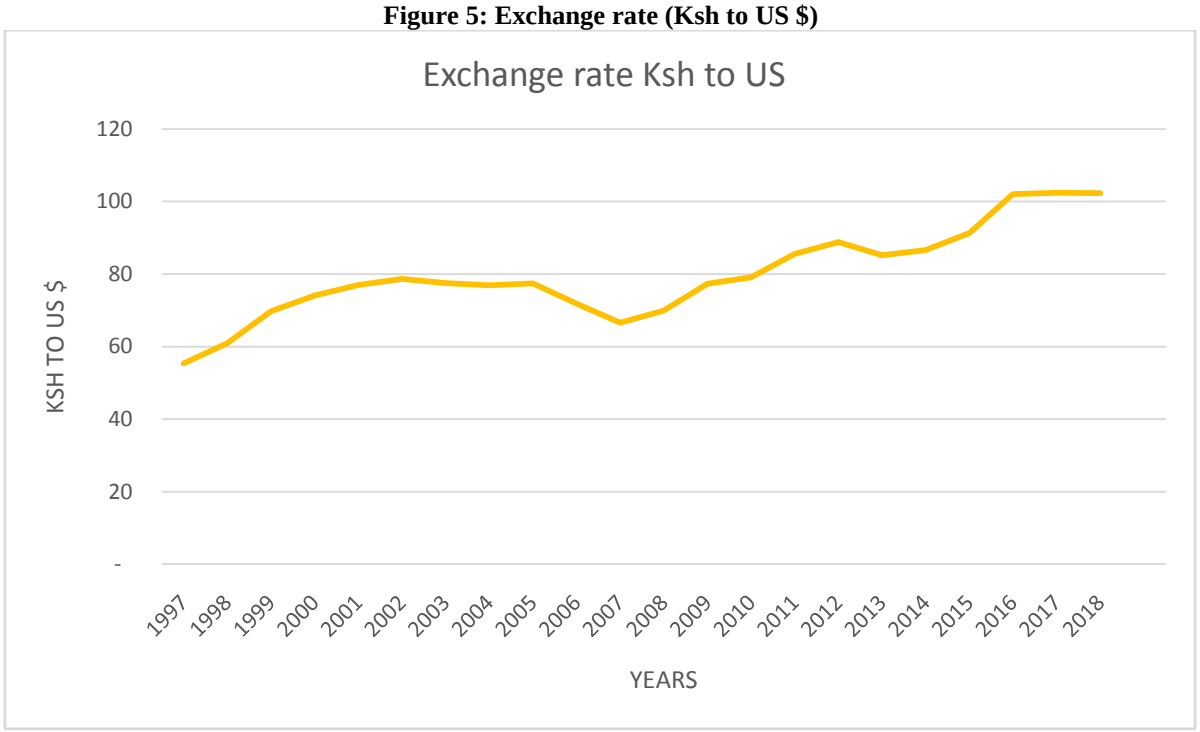
Source KNBS 2018

Figure 4: Trends in Exchange rate (KS to US$)



Source KNBS 2018

Figure 5: Exchange rate (Ksh to US $)



Source KNBS 2018

Table 4: Returns of pension funds

1997	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,390
1998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,020
1999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,308
2000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,201
2001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,649
2002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,629
2003	48,422,114	-	-	-	-	-	-	1,950	1,800	4,040	3,000	-	-	-	16,430	-	-	8,406
2004	54,247,164		-	-	-	-	-	2,090	1,900	6,040	3,480	-	-	-	29,815	-	1,119	9,724
2005	63,467,619	-	550	-	-	-	-	1,660	1,440	5,600	3,800	-	-	-	33,112	250	1,435	11,600
2006	71,842,668	-	650	-	-	-	-	2,100	1,850	6,410	4,480	-	-	6,794	40,369	240	1,657	15,400
2007	81,310,870	-	850	-	-	-	-	2,020	1,750	6,730	4,520	-	-	12,227	43,262	600	2,439	17,900
2008	90,508,481	-	9,750	-	8,167	3,641	-	1,690	1,300	6,780	4,470	-	-	15,077	111,129	750	3,029	20,200
2009	82,147,886	8,479,190	9,850	-	9,093	1,206	-	2,070	1,530	8,570	5,060	329	12,340	16,316	127,690	1,000	3,500	23,800
2010	98,606,651	10,180,166	11,250	-	11,324	2,983	-	2,400	1,740	8,600	6,160	4,677	23,827	25,362	140,080	2,600	6,568	30,691
2011	110,365,142	10,157,012	14,950	-	11,593	3,454	22,231	2,320	1,580	9,570	5,980	3,866	24,300	25,639	150,171	4,250	11,121	38,040
2012	110,461,021	11,019,006	18,750	-	14,231	5,159	32,575	2,590	1,840	8,050	4,810	4,175	27,400	35,820	143,212	4,061	14,070	47,420
2013	134,932,875	12,468,674	22,500	22,651,603	15,955	6,727	41,643	2,720	1,790	9,890	4,660	5,465	31,452	46,902	180,511	5,327	17,036	61,160
2014	153,028,834	403,852	19,550	21,869,164	17,870	8,608	36,737	3,032	2,070	9,076	6,110	6,157	33,194	72,450	180,999	6,706	23,690	74,510
2015	165,580,764	490,428	22,500	22,418,168	18,045	9,833	41,706	2,896	2,086	9,765	6,640	6,233	34,534	77,632	208,451	7,458	24,920	82,380
2016	172,086,349	14,972,472	24,250	2,089,239	18,690	11,337	45,169	3,298	2,525	10,190	7,211	6,864	35,098	83,642	214,683	8,352	26,500	90,570
2017	196,574,460	15,571,659	26,525	4,753,183	19,478	13,419	57,443	3,662	3,102	11,314	8,876	7,494	37,339	99,024	248,739	10,285	30,505	104,970
2018	224,024,782	15,919,920	27,725	6,878,389	18,961	14,200	68,491	3,642	3,086	11,633	9,200	7,619	36,579	101,500	290,570	12,185	32,976	114,170

Source: Pension schemes, 2018

Table 5: Descriptive Statistics of the pension funds

Statistic	*NSSF Fund Balance in KS '000'*	*TELPOSTA PENSION SCHEME in KS '000'*	*LAPTRUST inKsh '000'*	*CPF INDIVIDUAL PENSION in KS '000'*	*CPF INDIVIDUAL PENSION in KS '000'*	*Amana Umbrella Pension in KS '000'*	*KENYAPOWER PENSION FUND (Umbrella) in KS '000'*	*KENYAPOWER PENSION FUND in KS '000'*	*THE JUBILEE INSURANCE UMB in KS '000'*	*ICEALION LIFE ASSURANCE in KS '000'*	*The Heritage Insurance Grp - Fund value in KS '000'*	*The Heritage Life Insurance - Fund value in KS '000'*	*The Heritage Insurance Grp - Total asset in KS '000'*	*The Heritage Life Insurance - Total in KS '000'*
Mean	84,436,713	5,854,994	9,530	7,194,100	3,666,352	4,047,342	7,428	3,662	410,890	15,727	1,825	1,427	6,012	4,021
Standard Error	14,768,605	1,451,317	2,256	2,569,410	1,659,599	2,793,406	1,734	1,033	286,435	4,872	270	213	892	627
Median	81,729,378	-	5,300	-	-	-	4,083	603	-	-	2,080	1,745	6,755	4,500
Standard Deviation	69,270,895	6,807,279	10,584	11,774,517	7,784,210	13,102,236	8,132	4,847	1,343,500	22,854	1,267	998	4,186	2,939
Sample Variance	4,798,456,940,865,780	46,339,044,780,061	112,014,621	138,639,255,613,953	60,593,932,574,827	171,668,582,349,427	66,121,794	23,494,013	1,804,991,124,626	522,284,278	1,606,476	996,474	17,519,756	8,636,738
Kurtosis	(0.790)	(1.773)	(1.464)	(0.766)	2.845	8.103	(1.728)	(0.148)	9.133	(0.327)	(1.065)	(0.780)	(1.266)	(0.887)
Skewness	0.336	0.406	0.505	1.096	2.078	3.061	0.352	1.096	3.170	1.052	(0.425)	(0.309)	(0.488)	(0.121)
Range	224,024,782	15,969,424	27,725	29,944,944	22,651,603	45,303,206	19,478	14,200	5,137,056	68,491	3,662	3,102	11,633	9,200
Minimum	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum	224,024,782	15,969,424	27,725	29,944,944	22,651,603	45,303,206	19,478	14,200	5,137,056	68,491	3,662	3,102	11,633	9,200
Sum	1,857,607,680	128,809,870	209,650	151,076,106	80,659,746	89,041,534	163,406	80,567	9,039,587	345,995	40,140	31,389	132,258	88,457
Observ.	22	22	22	21	22	22	22	22	22	22	22	22	22	22

Statistic	*Liberty Life Assurance Kenya Ltd F in KS '000' Total assets*	*Liberty Life Assurance in KS '000' Fund value*	*Liberty Holdings in Ksh "000" Net assets*	*Liberty Holdings in Ksh "000" Total assets*	*Britam Life Assurance in KS '000'*	*BRITAM Individual Pension in KS '000'*	*Britam Umbrella Pension in KS '000'*	*Britam holdings consolidated in KS '000'*	*CfC life Insurance Holdings in '000'*	*CfC Stanbic Holdings Limited in Ksh '000'*	*CIC Life Assurance in Ksh '000'*	*CIC Insurance group limit in KS '000'(Total assets)*	*Jubelee Holdings in KS '000'*
Mean	7,115	6,453	2,404	13,457	7,237	7,142	247,134	28,108	8,938	98,147	2,912	9,117	35,597
Standard Error	2,288	2,078	650	3,395	3,098	4,509	171,678	7,569	3,468	20,084	819	2,445	7,659
Median	-	-	-	-	-	-	-	13,652	-	77,196	675	2,734	19,050
Standard Deviation	10,733	9,748	3,049	15,924	14,532	21,149	786,729	35,504	13,433	94,204	3,841	11,469	35,925
Sample Variance	115,196,838	95,014,754	9,295,644	253,560,547	211,184,259	447,296,498	618,942,411,293	1,260,502,058	180,452,778	8,874,364,174	14,751,568	131,543,386	1,290,603,530
Kurtosis	(1.294)	(1.275)	(1.450)	(1.764)	1.940	11.350	8.354	(0.299)	(0.984)	(1.076)	0.201	(0.550)	(0.260)
Skewness	0.882	0.889	0.638	0.452	1.808	3.324	3.060	1.079	0.964	0.486	1.166	1.003	1.049
Range	24,446	22,081	7,619	37,339	45,628	88,724	2,906,637	101,500	33,194	290,570	12,185	32,976	109,780
Minimum	-	-	-	-	-	-	-	-	-	-	-	-	4,390
Maximum	24,446	22,081	7,619	37,339	45,628	88,724	2,906,637	101,500	33,194	290,570	12,185	32,976	114,170

Sum	156,537	141,971	52,879	296,063	159,211	157,133	5,189,812	618,385	134,071	2,159,223	64,064	200,565	783,138
Observ.	22	22	22	22	22	22	21	22	15	22	22	22	22

The findings show that distribution is "normal," almost all (96%) of your observations fall within +/- 2 standard deviations from the mean.

4.3. Hypotheses testing

4.3.1. The effect of Corporate Governance (CG) on financial performance of pension plans

The first hypothesis of the study was to test and establish the effect of Corporate Governance (CG) on the financial performance of pension plans in Kenya. Regression analysis was used and the findings presented in tables 4-8 for the various pension funds.

4.3.4.1. Regression statistics on the effect of CG on performance of the NSSF

Table 6: Summary Output of the effect of CG index on NSSF performance

Regression Statistics	
Multiple R	0.8211
R Square	0.6742
Adjusted R Square	0.6579
Standard Error	42,668,332
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	75,337,914,288,764,500	75,337,914,288,764,500	41.38	0.0000028
Residual	20	36,411,730,496,989,300	1,820,586,524,849,470		
Total	21	111,749,644,785,754,000			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	181,107,884	17,201,655	10.5285	0.0000000	145,225,860	216,989,908
CG index	-25,720,614	3,998,344	-6.4328	0.0000028	-34,061,014	-17,380,214

i. Predictor: CG index
ii. Dependent variable: NSSF fund value

A multiple regression was carried out to investigate effect of Corporate Governance (CG) on financial performance of pension plans. The results of the regression indicated that the model explained 67.42% of the variation in the independent variable, the NSSF fund value. The study findings also showed that the model was a significant predictor of pension funding, $F(1,20) = 41.38$, $p < .001$. CG index contributed significantly to the model ($t = -6.43$, $p<.001$). The final predictive model was: **NSSF funding level = 181,107,884 – 25,720,614*CG index**.

4.3.4.2. Regression statistics on the effect of CG on performance of Teleposta, LAPTRUST, Heritage Insurance and CfC Stanbic pension schemes

Table 7: Summary output of the Effect of CG on Teleposta pension fund performance

Regression Statistics	
Multiple R	0.503
R Square	0.253
Adjusted R Square	0.216
Standard Error	5,549,487
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	208,665,180,097,711	208,665,180,097,711	6.78	0.0170
Residual	20	615,936,076,733,697	30,796,803,836,685		
Total	21	824,601,256,831,409			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	9,472,702	2,237,265	4.23405	0.00041	4,805,849	14,139,554
CG index	(1,353,629)	520,029	(2.60299)	0.01702	(2,438,390)	(268,868)

Table 8: Summary output of the Effect of CG on performance of LAPTRUST pension fund

Regression Statistics	
Multiple R	0.805
R Square	0.648
Adjusted R Square	0.630
Standard Error	6,437
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1,523,530,772	1,523,530,772	37	0.0000063
Residual	20	828,776,274	41,438,814		
Total	21	2,352,307,045			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	22,885	2,595	8.818217981	0.000000025	17,471	28,298
CG index	(3,658)	603	(6.063480123)	0.000006303	(4,916)	(2,399)

Table 9: Summary output of the Effect of CG on the performance of Heritage Insurance fund

Regression Statistics	
Multiple R	0.6701
R Square	0.4490
Adjusted R Square	0.4214
Standard Error	759
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	9,395,184	9,395,184	16	0.0006455
Residual	20	11,530,767	576,538		
Total	21	20925951.86			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2,476	306	8.08709798	0.0000001 0	1,837	3,114
CG index	(287)	71	(4.03681218)	0.0006455 0	(436)	(139)

Table 10: Summary output of the Effect of CG on the performance of the CfC Stanbic Holdings pension fund

Regression Statistics	
Multiple R	0.7751
R Square	0.6008
Adjusted R Square	0.5808
Standard Error	60,991
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	111,963,792,226	111,963,792,226	30	0.0000227
Residual	20	74,397,855,437	3,719,892,772		
Total	21	186,361,647,664			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	212,637	24,588	8.647860	0.000000034	161,346	263,927
CG index	(31,355)	5,715	(5.486225)	0.000022717	(43,277)	(19,434)

The study established that the R^2 for the overall models of the other funds namely Teleposta, LAPTRUST, Heritage Insurance and CfC Stanbic pensionwere 25.3%; 64.8%; 44.9%; and 60.08% with an adjusted R^2 of 21.6%; 63%; 42.14%; and 58.08% respectively as indicated in tables 6-9. These results imply that the models explained 25-65% of the variation in the independent variable, the pension fund value depending on the fund being tested.Thus 25-65% of the variance in the dependent variable (NSSF value) is explained by the independent variables (CG index) in the model. In addition, the study established that the models were significant predictors of pension funding: Teleposta- $F(1,20) = 6.78$, $p < .05$; LAPTRUST- $F(1,20) = 37$, $p < .001$; Heritage Insurance- $F(1,20) = 16$, $p < .001$ and CfC Stanbic pension- $F(1,20) = 30$, $p < .001$. The coefficient statistics that tells us the extent to which the individual predictor variables contribute to the model,indicated that CG index contributed significantly to the four models of the various pension funds: Teleposta $t = -2.6$, $p < .05$; LAPTRUST $t = -6.06$, $p < .001$; Heritage Insurance $t = -4.04$, $p < .001$; and CfC Stanbic pension $t = -5.49$, $p < .001$. These findings show that CG is a useful predictor of pension funding level as it has a significant impact on the funding levels. This implies that the tested hypotheses is accepted: **H_1**: Corporate governance (CG) has a significant relationship with the financial performance of pension plans.

4.3.2. The effect of Investment Strategy (IS) (mediator) on the relationship between corporate governance and financial performance of pension plans

Mediation analysis using multiple regression was carried out to investigate the effect of Investment Strategy (IS) (mediator) on the relationship between corporate governance and financial performance of pension plans. The regression process involved testing mediational hypotheses through the 4 steps as outlined by Baron and Kenny (1986), Judd and Kenny (1981), and James and Brett (1984). The study findings are indicated in the tables below.

4.3.4.1. The effect of CG on NSSF funding

Table 11: Step 1: Summary output of the effect of CG on NSSF funding

Regression Statistics	
Multiple R	0.8211
R Square	0.6742
Adjusted R Square	0.6579
Standard Error	42,668,332
Observations	22

ANOVA

	Df	***SS***	***MS***	***F***	***Significance F***
Regression	1	75,337,914,288,764,500	75,337,914,288,764,500	41.38	0.0000028
Residual	20	36,411,730,496,989,300	1,820,586,524,849,470		
Total	21	111,749,644,785,754,000			

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	181,107,884	17,201,655	10.5285148	0.0000000	145,225,860	216,989,908
CG index	(25,720,614)	3,998,344	(6.4328161)	0.0000028	(34,061,014)	(17,380,214)

The results of the regression indicate that the model explained 67.42% of the variation in the NSSF fund value. In addition, the model was a significant predictor of NSSF funding level as shown by the F (1,20) = 41.38, p < .001. CG index contributed significantly to the model (t = -6.43, p<.001). Corporate governance is thus individually useful in the prediction of the NSSF fund level. The final predictive model was:

NSSF funding level = 181,107,884 – 25,720,614*CG index.

4.3.4.2. The effect of corporate governance (CG index) on investment strategy (IS index) (mediating factor)

Table 12: Step 2: Summary output of the effect of CG on IS (mediating factor)

Regression Statistics	
Multiple R	0.99197
R Square	0.98400
Adjusted R Square	0.98320
Standard Error	0.30840
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	117	117	1,230	0.0000
Residual	20	2	0		
Total	21	119			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.06951	0.12433	0.55907	0.58232	(0.18984)	0.32886
CG index	1.01367	0.02890	35.07541	0.00000	0.95339	1.07396

The study findings show that the R^2 for the overall model was 98.4% with an adjusted R^2 of 98.3%. A high size effect is reported of the model. The results imply that the model explained 98.4% of the variation in the dependent variable, IS index. In addition, the model was a significant predictor of the IS index as shown by the F (1,20) = 1,230, p < .001. The coefficient statistics show that CG index contributed significantly to the model (t = 35.08, p <.001). Corporate governance is thus individually useful in the prediction of the IS index. The final predictive model was: **IS index = 0.0695+ 1.0137*CG index**.

4.3.4.3. The effect of investment strategy (IS) (mediating factor) on NSSF funding level

Table 13: Step 3: Summary output of the effect of IS (mediating factor) on NSSF level

Regression Statistics	
Multiple R	0.84
R Square	0.70
Adjusted R Square	0.69
Standard Error	40,662,844
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	78,680,306,957,670,700	78,680,306,957,670,700	48	0.0000011

Residual	20	33,069,337,828,083,200	1,653,466,891,404,160			
Total	21	111,749,644,785,754,000				
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	184,185,824	16,518,489	11.1502826	0.0000000	149,728,859	218,642,788
IS index	(25,722,232)	3,728,837	(6.8981919)	0.0000011	(33,500,449)	(17,944,014)

The regression statistics showed that the R^2 for the overall model was 70% with an adjusted R^2 of 69%. A high size effect is reported of the model. IS index thus explains 70% of the variation in the dependent variable, NSSF funding level. The study findings also show that the model was a significant predictor of the NSSF funding level as indicated by the F (1,20) = 48, p < .001. The model therefore has explanatory power. The coefficient statistics show that IS index contributed significantly to the model (t = = -6.9, p <.001). Investment Strategy is thus individually useful in the prediction of the NSSF funding level. The final predictive model was: **NSSF funding level = 184,185,824 -25,722,232*IS index.**

The study findings show that Step 1-3 establishes that there is a linear relationship among the variables NSSF funding level, CG index and IS index. All the relations are significant indicating that mediation is possible allowing proceed to step 4.

4.3.4.4. The effect of CG index and IS index on NSSF funding level

Table 14: Step 4: Summary output of the effect of CG and IS indices on the NSSF level

Regression Statistics	
Multiple R	0.84
R Square	0.71
Adjusted R Square	0.68
Standard Error	41,154,914
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	79,568,832,814,393,800	39,784,416,407,196,900	23	0.0000073
Residual	19	32,180,811,971,360,100	1,693,726,945,861,060		
Total	21	111,749,644,785,754,000			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	184,386,094	16,720,669	11.027435	0.000000	149,389,331	219,382,858
Corporate Governance Index	22,085,080	30,491,981	0.724291	0.477712	(41,735,370)	85,905,531
Investment Strategy Index	(47,160,930)	29,839,169	(1.580504)	0.130496	(109,615,030)	15,293,169

Regression statisticsshow that the R^2 for the overall model was 71% with an adjusted R^2 of 68%. A high size effect is reported of the model. The two independent variables CG index and IS index explain 71% of the variation in the dependent variable, NSSF funding level. The ANOVA analysis showed that the model was a significant predictor of the NSSF funding level as indicated by the F (2,19) = 23, p < .001. The model therefore has explanatory power. The coefficient statistics however, show that CG index and IS index did not contribute significantly to the model (CG index t = 0.72, p = 0.478; IS index t = -1.58, p = 0.130). In both cases the p value > .05. The two factors are therefore not individually significant in the prediction of the NSSF fund level. The final predictive model was:

NSSF fund level = 184,386,094+ 22,085,080*CG index - 47,160,930*IS index.

4.3.4.5. The effect of CG and IS indices on the CfC funding level

Table 15: Step 4: Summary output of the effect of CG index & IS index on the funding level of the CfC pension fund

Regression Statistics	
Multiple R	0.85
R Square	0.73

Adjusted R Square	0.70
Standard Error	51,752
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	135,475,201,498	67,737,600,749	25	0.0000044
Residual	19	50,886,446,166	2,678,234,009		
Total	21	186,361,647,664			

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	220,365	21,026	10.4806	0.0000	176,357	264,373
CG index	81,339	38,343	2.1213	0.0473	1,086	161,592
IS index	(111,174)	37,522	(2.9629)	0.0080	(189,709)	(32,639)

Regression statisticsshow that the R^2 for the overall model was 73% with an adjusted R^2 of 70%. A high size effect is reported of the model. The findings imply that the two independent variables CG index and IS index explain 73% of the variation in the dependent variable, CfC funding level. The ANOVA analysis showed that the model was a significant predictor of the CfC funding level as indicated by the F (2,19) = 25, p<.001. The model therefore has explanatory power. In contrast to the NSSF, the coefficient statistics show that CG index and IS index contributed significantly to the model (CG index t = 2.12, p < .05; IS index t = -2.96, p < .05). The two factors are therefore individually useful in the prediction of the CfC fund level. The final predictive model was:

CfC fund level = 220,365 + 81,339*CG index - 111,174*IS index.

The above study findings show that investment strategy has a significant mediating effect on the performance of pension funds though its individual contribution in the model varies. This implies that the tested hypotheses is accepted: **H_2**: Investment strategy has a significant intervening/mediating effect on the relationship between governance and financial performance of pension plans.

4.3.3. The effect of macroeconomic variables on the relationship between governance and financial performance of pension plans.

The third hypothesis of the study was to test and establish the effect of macroeconomic variables on the relationship between governance and financial performance of pension plansRegression analysis was used and the findings presented in tables 14-23 for the various pension funds.

Table 16: Summary Output of the effect of macroeconomic variables on the relationship between governance and performance of the NSSF fund

Regression Statistics	
Multiple R	0.969
R Square	0.939
Adjusted R Square	0.915
Standard Error	21,306,237
Observations	22

ANOVA

	Df	***SS***	***MS***	***F***	***Significance F***
Regression	6	104,940,309,049,676,000	17,490,051,508,279,300	39	0.000000028
Residual	15	6,809,335,736,077,780	453,955,715,738,519		
Total	21	111,749,644,785,754,000			

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	(229,107,863)	100,116,787	(2.2884)	0.0370	(442,501,744)	(15,713,982)
GDP growth rate	401,766,548	313,938,359	1.2798	0.2201	(267,377,226)	1,070,910,321
Inflation rate	391,174,224	178,487,609	2.1916	0.0446	10,736,892	771,611,557
Average interest rate	(4,403,605)	173,268,068	(0.0254)	0.9801	(373,715,751)	364,908,540
NSE 20 share index	16,400	6,580	2.4923	0.0249	2,374	30,425
Exchange rate Ksh to	3,164,111	810,833	3.9023	0.0014	1,435,861	4,892,361

US						
CG INDEX	(10,983,574)	3,795,992	(2.8935)	0.0111	(19,074,539)	(2,892,610)

Table 17: Summary output of the effect of macroeconomic variables on the relationship between governance and financial performance of theTeleposta fund

Regression Statistics	
Multiple R	0.9395
R Square	0.8826
Adjusted R Square	0.8356
Standard Error	2,759,923.3637
Observations	22.0000

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	858,862,285,778,900	143,143,714,296,483	18.7922	0.00000342
Residual	15	114,257,654,602,386	7,617,176,973,492		
Total	21	973,119,940,381,286			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(46,080,606)	12,968,722	(3.55321)	0.00289	(73,722,783)	(18,438,430)
GDP growth rate	65,033,785	40,666,300	1.59921	0.13062	(21,644,382)	151,711,952
Inflation rate	36,084,049	23,120,560	1.56069	0.13944	(13,196,258)	85,364,356
Average interest rate	60,937,498	22,444,442	2.71504	0.01597	13,098,302	108,776,694
NSE 20 share index	1,337	852	1.56810	0.13771	(480)	3,153
Exchange rate Ksh to US	446,550	105,032	4.25156	0.00070	222,680	670,421
CG INDEX	(452,452)	491,717	(0.92015)	0.37206	(1,500,523)	595,618

Table 18: Summary output effect of macroeconomic factors on the relationship between governance and financial performance of the LAPTRUST pension fund

Regression Statistics	
Multiple R	0.9594
R Square	0.9205
Adjusted R Square	0.8887
Standard Error	3,531.26
Observations	22.00

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	6	2,165,259,829	360,876,638	28.9400	0.00000020
Residual	15	187,047,217	12,469,814		
Total	21	2,352,307,045			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(70,995)	16,593	(4.27856)	0.00066	(106,363)	(35,627)
GDP growth rate	18,999	52,032	0.3651	0.72011	(91,904)	129,902
Inflation rate	67,856	29,582	2.2938	0.03666	4,803	130,909
Average interest rate	79,860	28,717	2.7809	0.01399	18,651	141,070
NSE 20 share index	2.8451	1.0906	2.6088	0.01975	0.5206	5.1697
Exchange rate Ksh to US	723	134	5.3825	0.00008	437	1,010
CG INDEX	(898)	629	(1.4275)	0.17393	(2,239)	443

Table 19: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of the Kenya Power Company DB pension fund

Regression Statistics	
Multiple R	0.9651
R Square	0.9315
Adjusted R Square	0.9041
Standard Error	1,501
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	459,581,037	76,596,839	34.00	0.00000007
Residual	15	33,793,233	2,252,882		
Total	21	493,374,270			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(22,922)	7,053	(3.24999)	0.00538	(37,955)	(7,889)
GDP growth rate	(6,621)	22,116	(0.29936)	0.76877	(53,760)	40,519
Inflation rate	18,888	12,574	1.50214	0.15382	(7,913)	45,688
Average interest rate	29,090	12,206	2.38325	0.03082	3,074	55,107
NSE 20 share index	0.8093	0.4636	1.74578	0.10129	(0.1788)	1.7973
Exchange rate Ksh to US	275	57	4.81706	0.00023	153	397
CG INDEX	(838)	267	(3.13236)	0.00685	(1,408)	(268)

Table 20: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of the Kenya Power Company DC pension fund

Regression Statistics	
Multiple R	0.9442
R Square	0.8916
Adjusted R Square	0.8482
Standard Error	3,168
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	1,238,023,096	206,337,183	20.56	0.0000019
Residual	15	150,534,582	10,035,639		
Total	21	1,388,557,678			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(54,988)	14,886	(3.6940)	0.0022	(86,716)	(23,260)
GDP growth rate	14,443	46,678	0.3094	0.7613	(85,048)	113,934
Inflation rate	53,905	26,538	2.0312	0.0603	(2,661)	110,470
Average interest rate	60,035	25,762	2.3303	0.0342	5,124	114,946
NSE 20 share index	2.3928	0.9784	2.4457	0.0273	0.3075	4.4782
Exchange rate Ksh to US	550	121	4.5639	0.0004	293	807
CG INDEX	(608)	564	(1.0767)	0.2986	(1,811)	595

Table 21: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of theHeritage (Grp)

Regression Statistics	
Multiple R	0.9704
R Square	0.9417
Adjusted R Square	0.9184
Standard Error	362
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	31,735,539	5,289,256	40.38	0.000000020
Residual	15	1,964,759	130,984		
Total	21	33,700,297			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(3,363)	1,701	(1.9772)	0.0667	(6,987)	262
GDP growth rate	10,267	5,333	1.9253	0.0734	(1,100)	21,633
Inflation rate	6,107	3,032	2.0142	0.0623	(356)	12,569
Average interest rate	(4,866)	2,943	(1.6532)	0.1191	(11,139)	1,408
NSE 20 share index	0.3558	0.1118	3.1836	0.0062	0.1176	0.5941
Exchange rate Ksh to US	50	14	3.6612	0.0023	21	80
CG INDEX	(103)	64	(1.5978)	0.1309	(240)	34

Table 22: Summary output effect of macroeconomic factors on the relationship between governance andfinancial performance of theHeritage insurance pension fund

Regression Statistics	
Multiple R	0.9370
R Square	0.8779
Adjusted R Square	0.8291
Standard Error	413
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	18,370,882	3,061,814	17.97	0.00000455
Residual	15	2,555,070	170,338		
Total	21	20,925,952			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(1,562)	1,939	(0.8053)	0.4332	(5,695)	2,572
GDP growth rate	7,256	6,081	1.1931	0.2514	(5,706)	20,217
Inflation rate	3,604	3,457	1.0423	0.3138	(3,766)	10,973
Average interest rate	(6,065)	3,356	(1.8069)	0.0909	(13,218)	1,089
NSE 20 share index	0.2259	0.1275	1.7723	0.0967	(0.0458)	0.4976
Exchange rate Ksh to US	33.83	15.71	2.15	0.0479	0.35	67.31
CG INDEX	(88.43)	73.53	(1.20)	0.2478	(245.16)	68.30

Table 23: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of theLiberty pension fund

Regression Statistics	
Multiple R	0.9805
R Square	0.9614
Adjusted R Square	0.9459
Standard Error	2,496
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	2,325,669,101	387,611,517	62.21	0.0000000010
Residual	15	93,464,508	6,230,967		
Total	21	2,419,133,608			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(55,442)	11,729	(4.7267)	0.00027	(80,442)	(30,441)
GDP growth rate	(52,341)	36,780	(1.4231)	0.17518	(130,736)	26,054
Inflation rate	(10,922)	20,911	(0.5223)	0.60908	(55,493)	33,649
Average interest rate	95,816	20,300	4.7201	0.00027	52,548	139,084
NSE 20 share index	3.2834	0.7709	4.2590	0.00069	1.6402	4.9265
Exchange rate Ksh to US	613	95	6.4496	0.00001	410	815
CG INDEX	(1,944)	445	(4.3704)	0.00055	(2,892)	(996)

Table 24: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of theCFC (GRP)

Regression Statistics	
Multiple R	0.9777
R Square	0.9559
Adjusted R Square	0.9383
Standard Error	2,850
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	2,640,595,904	440,099,317	54.19	0.0000000025
Residual	15	121,815,199	8,121,013		
Total	21	2,762,411,103			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(54,235)	13,391	(4.0502)	0.0010	(82,777)	(25,693)
GDP growth rate	40,691	41,990	0.9691	0.3479	(48,808)	130,190
Inflation rate	43,484	23,873	1.8215	0.0885	(7,400)	94,368
Average interest rate	76,351	23,175	3.2946	0.0049	26,955	125,747
NSE 20 share index	1.7419	0.8801	1.9791	0.0665	(0.1340)	3.6178
Exchange rate Ksh to US	624	108	5.7512	0.0000	393	855
CG INDEX	(1,993)	508	(3.9255)	0.0013	(3,075)	(911)

Table 25: Summary outputeffect of macroeconomic factors on the relationship between governance andfinancial performance of theCFC assurance fund

Regression Statistics	
Multiple R	0.9625
R Square	0.9264
Adjusted R Square	0.8970
Standard Error	1,233
Observations	22

ANOVA

	Df	SS	MS	F	Significance F
Regression	6	286,981,436	47,830,239	31.47	0.00000011
Residual	15	22,801,500	1,520,100		
Total	21	309,782,936			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	(18,671)	5,793	(3.2227)	0.0057	(31,019)	(6,322)
GDP growth rate	21,617	18,167	1.1899	0.2526	(17,104)	60,338
Inflation rate	16,221	10,329	1.5705	0.1371	(5,793)	38,236
Average interest rate	26,366	10,026	2.6296	0.0189	4,995	47,737
NSE 20 share index	0.3548	0.3808	0.9317	0.3662	(0.4568)	1.1664
Exchange rate Ksh to US	214	47	4.5530	0.0004	114	314
CG INDEX	(605)	220	(2.7529)	0.0148	(1,073)	(137)

i. Predictors: GDP growth rate, Inflation rate, NSE 20 share index, Exchange rate, Average interest rate and CG index.

ii. Dependent variable: Pension fund value

4.3.4.1. The effect of macroeconomic variables (moderators) on the relationship between governance and financial performance of pension plans

A multiple regression was carried out to investigate effect of macroeconomic variables (moderators) on the relationship between corporate governance and financial performance of pension plans. The results of the regression indicated that the Pearson's product moment correlation (r) ranged between 0.82-0.97 for the tested pension funds indicating a strong positive relationship. In addition, the R^2 for the overall model for the various pension funds ranged between 86-97% with an adjusted R^2 ranging between 82-95%. The models therefore explained 86-97% of the variance of the pension fund level. Thus, the combined effect of GDP growth rate, Inflation rate, Average interest rate, NSE 20 share index, Exchange rate and CG index explain 86-97% of the variation in the independent variable, pension fund value.

The study also established that the model was a significant predictor of pension fund value as indicated by the F statistics in the ANOVA Tables 14-23: NSSF -F (6,15) = 39, p values <.001;Teleposta -F (6,15) = 18.79, p values <.001; LAPTRUST -F (6,15) = 28.94, p values <.001, KPLCI Individual- F (6,15) = 34, p values <.001; KPLCI umbrella- F (6,15) = 20.56, p values <.001; Heritage (Grp) - F (6,15) = 40.38, p values <.001; Heritage Life insurance- F (6,15) = 17.97, p values <.001: Liberty fund- F (6,15) = 62.21, p values <.001; CfC (Grp)- F (6,15) = 54.19, p values <.001 and CfC Life assurance fund F (6,15) = 31.47, p values <.001. The results show strong evidence to reject the null hypotheses that the coefficient is equal to zero (no effect). The results thus indicate that there is significant regression relationship between the dependent variable (pension funding level) and the predictor variables (macroeconomic variables and CG index) as is indicated by a large F values and a small significance level.

The relative importance of the independent variables is judged for by the magnitude of the t statistics. The study findings indicate that thet test is statistically significant for the tested macroeconomic variables and CG index because of their high t values and small significance levels. The effects of individual predictor variables on the relationship however, varied with the pension fund as indicated by the Coefficient Tables 14-23. Exchange rate was found to be individually useful in the prediction of all (10) the assessed pension fund levels: t ranged between 2.15-6.44, p value<.05. Average interest rate was individually valuable in the prediction 7 pension funds : Teleposta (t=2.72, p value<.05), LAPTRUST(t=2.78, p value < .05), KPLCI Individual(t=2.38, p value < .05), KPLCI umbrella (t=2.33, p value < .05), Liberty funds (t=4.72, p value < .001), CfC (Grp) (t=3.29, p value < .05), and CfC Life insurance fund(t=2.63, p value < .05). The NSE 20 share index on the other hand was found to be individually useful in the prediction of 5 pension funds: the NSSF (t=2.49, p value < .05), LAPTRUST(t=2.61, p value < .05), KPLC umbrella (t=2.45, p value < .05), Heritage (GRP) (t=3.18, p value < .05), Liberty fund (t=4.26, p value < .001).

The study also established that Inflation rate was found to be individually significant in the prediction of 2 pension funds: the LAPTRUST (t=2.29, p value < .05), and NSSF (t=2.19, p value < .05) whereas CG index was significant in the prediction of 5 schemes: the NSSF (t=-2.89, p value < .05), KPLC individual (t=-3.12, p value < .05), Liberty fund (t= -4.37, p value < .001), CfC (Grp) (t= - 3.93, p value < .001), CfC fund (t=-2.75, p value < .05). The study nonetheless established that GDP growth rate was not individually significant in the prediction of any of the funds funding levels.

An evaluation of the p-values suggests that four independent variables are statistically significant in the prediction of fund levels with the exception of GDP growth rate. The findings show that exchange rate is the most significant independent variable, followed by Average interest rate and NSE 20 share index. GDP growth rate does not reach statistical significance (p>.05) in the multiple regression model in all the tested funds. These results imply that the influence of individual macroeconomic factors and CG index in the prediction of fund levels varies. In general, the study establishes the acceptance of three hypotheses involving inflation rate, interest rate and exchange rate and rejection of one involving GDP growth rate suggesting that:

a) Inflation rate has a significant moderating effect on the relationship between CG practices and financial performance of pension plans.

b) Interest rate has a significant moderating effect on the relationship between CG practices and financial performance of pension plans.

c) Exchange rate has a significant moderating effect on the relationship between CG practices and fiscal performance of pension plans.

d) GDP growth rate has no significant moderating effect on the association between CG practices and financial performance of pension plans.

4.3.4. The joint effect of CG, IS, & macroeconomic factors on the performance of pension funds in Kenya.

The fourth hypothesis of the study was to investigate whether the joint effect of CG index, IS index, & macroeconomic factors on pension performance is greater than the individual effect of CG on pension performance in Kenya.Regression analysis was used and the findings presented in tables 24-36 for the various pension funds.

Table 26:Summary output of the effect of CG index, IS index, & macroeconomic factors on the financial performance NSSF

Regression Statistics	
Multiple R	0.9713
R Square	0.9434
Adjusted R Square	0.9151
Standard Error	21,256,994
Observations	22

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	7	105,423,607,676,679,000	15,060,515,382,382,700	33	0.00000011
Residual	14	6,326,037,109,075,290	451,859,793,505,378		
Total	21	111,749,644,785,754,000			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(185,990,325)	108,237,139	(1.7184)	0.1078	(418,135,899)	46,155,249
GDP growth rate	427,424,473	314,193,821	1.3604	0.1952	(246,454,252)	1,101,303,197
Inflation rate	338,823,452	185,129,857	1.8302	0.0886	(58,240,601)	735,887,505
Average interest rate	(57,278,894)	180,269,632	(0.3177)	0.7554	(443,918,801)	329,361,014
NSE 20 share index	14,990	6,705	2.2356	0.0422	609	29,371
Exchange rate Ksh to US	2,862,354	859,971	3.3284	0.0050	1,017,900	4,706,807
CG INDEX	6,828,427	17,634,398	0.3872	0.7044	(30,993,595)	44,650,448
IS INDEX	(18,456,282)	17,845,894	(1.0342)	0.3186	(56,731,917)	19,819,352

4.3.4.1. The joint effect of CG, IS, & macroeconomic factors on NSSF funding level

A multiple regression was carried out to investigate whether the joint effect of CG index, IS index, & macroeconomic factors on performance of the NSSF is greater than the individual effect of CG. The results of the regression indicated that the model explained 94.34% of the variance and that the model was a significant predictor of pension performance, $F(7,14) = 33$, $p < .001$. Whereas the NSE 20 share index ($t = 2.24$, $p<.05$) and Exchange rate ($t = 3.33$, $p<.05$) contributed significantly to the model, the other factors did not as indicated by their low t values and high p values: GDP growth rate ($t = 1.36$, $p=.195$); Inflation rate ($t = 1.83$, $p=.089$); Average interest rate ($t = -0.318$, $p=.755$); CG index ($t = 0.387$, $p=.704$); IS index ($t = -1.034$, $p=.319$). The final predictive model for the NSSF fund was:

NSSF fund value = -185,990,325 + 427,424,473* GDP growth rate + 338,823,452* Inflation rate-
57,278,894*Average interest rate+14,990*NSE 20 share index +
2,862,354*Exchange rate +6,828,427*CG index - 18,456,282*IS index.

The study shows that when one compares the joint effect of CG, IS, GDP growth rate, Inflation rate, Average interest rate, NSE 20 share index, Exchange rate and individual effect of CG index on performance of the NSSF, the study findings indicate that the joint effect is greater than the individual effect as shown by the regression statisticsin table 4 and 24. The tables show that the joint effect performed better as the model explained 94.34% compared to 67.42% of the later on the variation in the independent variable, the NSSF value. The Pearson's correlation coefficient r, a measure of the strength of the association between the two variables,

was 0.97 for the joint effect compared to 0.82 for the individual effect of CG index on NSSF value. The study also established that the Pearson's correlation coefficient (r) was greater for the joint effect ranging between 0.94-0.98 as compared to the individual effect of CG index on the other tested pension funds. For the later it ranged between 0.50-0.82. Both models were however, significant in predicting the dependent variable, NSSF value as indicated by the high F valuesand low p values: Joint effect- $F (7, 14) = 33$, p value<.001; Individual effect of CG index - $F (1,20) = 41.38$, p value<.001.

4.3.4.2. The joint effect of CG index, IS index, & macroeconomic factors on other pension funds

Table 27:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Teleposta pension scheme

Regression Statistics	
Multiple R	0.9573
R Square	0.9164
Adjusted R Square	0.8745
Standard Error	2,411,255
Observations	22

ANOVA

	df	***SS***	***MS***	***F***	***Significance F***
Regression	7	891,721,842,692,605	127,388,834,670,372	22	0.0000016
Residual	14	81,398,097,688,681	5,814,149,834,906		
Total	21	973,119,940,381,286			

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	(34,837,741)	12,277,715	(2.83748)	0.01317	(61,170,821)	(8,504,660)
GDP growth rate	71,724,070	35,640,099	2.01245	0.06382	(4,716,340)	148,164,479
Inflation rate	22,433,624	20,999,924	1.06827	0.30347	(22,606,733)	67,473,982
Average interest rate	47,150,306	20,448,612	2.30579	0.03694	3,292,396	91,008,217
NSE 20 share index	969	761	1.27408	0.22338	(662)	2,600
Exchange rate Ksh to US	367,867	97,549	3.77108	0.00207	158,644	577,090
CG INDEX	4,192,013	2,000,331	2.09566	0.05477	(98,270)	8,482,297
IS INDEX	(4,812,462)	2,024,322	(2.37732)	0.03224	(9,154,200)	(470,723)

Table 28:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of LAPTRUST

Regression Statistics	
Multiple R	0.9693
R Square	0.9396
Adjusted R Square	0.9094
Standard Error	3,185
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	2,210,299,246	315,757,035	31	0.00000017
Residual	14	142,007,799	10,143,414		
Total	21	2,352,307,045			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(57,832)	16,217	(3.5662)	0.0031	(92,614)	(23,051)
GDP growth rate	26,831	47,075	0.5700	0.5777	(74,134)	127,797
Inflation rate	51,875	27,737	1.8702	0.0825	(7,616)	111,366
Average interest rate	63,719	27,009	2.3592	0.0334	5,790	121,648
NSE 20 share index	2.4148	1.0046	2.4038	0.0306	0.2602	4.5694
Exchange rate Ksh to US	631	129	4.8989	0.0002	355	908
CG INDEX	4,539	2,642	1.7181	0.1078	(1,127)	10,206
IS INDEX	(5,634)	2,674	(2.1072)	0.0536	(11,369)	101

Table 29:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of KPLC Umbrella

Regression Statistics	
Multiple R	0.9630
R Square	0.9274
Adjusted R Square	0.8911
Standard Error	2,684
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	1,287,710,580	183,958,654	26	0.00000061
Residual	14	100,847,098	7,203,364		
Total	21	1,388,557,678			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(41,163)	13,666	(3.01205)	0.00933	(70,473)	(11,852)
GDP growth rate	22,670	39,670	0.57146	0.57674	(62,414)	107,754
Inflation rate	37,119	23,374	1.58801	0.13461	(13,014)	87,252
Average interest rate	43,081	22,761	1.89276	0.07925	(5,736)	91,898
NSE 20 share index	2	1	2.29259	0.03788	0	4
Exchange rate Ksh to US	453	109	4.17630	0.00093	221	686
CG INDEX	5,103	2,227	2.29214	0.03791	328	9,879
IS INDEX	(5,918)	2,253	(2.62637)	0.01993	(10,750)	(1,085)

Table 30:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of KPLC Individual pension scheme

Regression Statistics	
Multiple R	0.9687
R Square	0.9384
Adjusted R Square	0.9076
Standard Error	1,473
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	462,995,003	66,142,143	30	0.00000020
Residual	14	30,379,266	2,169,948		
Total	21	493,374,270			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(19,298)	7,501	(2.5729)	0.0221	(35,385)	(3,211)
GDP growth rate	(4,464)	21,773	(0.2050)	0.8405	(51,163)	42,235
Inflation rate	14,488	12,829	1.1293	0.2778	(13,028)	42,004
Average interest rate	24,646	12,492	1.9729	0.0686	(2,147)	51,440
NSE 20 share index	1	0	1.4867	0.1593	(0)	2
Exchange rate Ksh to US	250	60	4.1915	0.0009	122	378
CG INDEX	659	1,222	0.5396	0.5980	(1,962)	3,280
IS INDEX	(1,551)	1,237	(1.2543)	0.2303	(4,204)	1,101

Table 31:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Heritage GRP pension scheme

Regression Statistics	
Multiple R	0.9724
R Square	0.9455
Adjusted R Square	0.9182
Standard Error	362
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	31,862,922	4,551,846	35	0.00000009
Residual	14	1,837,376	131,241		
Total	21	33,700,297			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(4,063)	1,845	(2.2023)	0.0449	(8,019)	(106)
GDP growth rate	9,850	5,355	1.8396	0.0871	(1,634)	21,335
Inflation rate	6,957	3,155	2.2049	0.0447	190	13,724
Average interest rate	(4,007)	3,072	(1.3043)	0.2132	(10,597)	2,582
NSE 20 share index	0	0	3.3144	0.0051	0	1
Exchange rate Ksh to US	55	15	3.7749	0.0020	24	87
CG INDEX	(392)	301	(1.3050)	0.2129	(1,037)	252
IS INDEX	300	304	0.9852	0.3413	(353)	952

Table 32:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Heritage Life Insurance Fund

Regression Statistics	
Multiple R	0.9460
R Square	0.8949
Adjusted R Square	0.8423
Standard Error	396
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	18,725,895	2,675,128	17	0.0000075
Residual	14	2,200,057	157,147		
Total	21	20,925,952			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(2,730)	2,018	(1.3527)	0.1976	(7,060)	1,599
GDP growth rate	6,560	5,859	1.1196	0.2817	(6,007)	19,127
Inflation rate	5,022	3,452	1.4548	0.1678	(2,382)	12,427
Average interest rate	(4,632)	3,362	(1.3777)	0.1899	(11,842)	2,579
NSE 20 share index	0.2641	0.1250	2.1122	0.0531	(0.0041)	0.5323
Exchange rate Ksh to US	42	16	2.6195	0.0202	8	76
CG INDEX	(571)	329	(1.7369)	0.1044	(1,277)	134
IS INDEX	500	333	1.5030	0.1550	(214)	1,214

Table 33:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Liberty Life Insurance Fund

Regression Statistics	
Multiple R	0.971
R Square	0.942
Adjusted R Square	0.914
Standard Error	896
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	183,958,258	26,279,751	33	0.00000013
Residual	14	11,250,265	803,590		
Total	21	195,208,523			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(16,468)	4,564	(3.6078)	0.0029	(26,258)	(6,678)
GDP growth rate	31,472	13,250	2.3752	0.0324	3,054	59,890
Inflation rate	6,960	7,807	0.8914	0.3878	(9,785)	23,704
Average interest rate	26,024	7,602	3.4232	0.0041	9,719	42,329
NSE 20 share index	0.4733	0.2828	1.6740	0.1163	(0.1331)	1.0798
Exchange rate Ksh to US	169	36	4.6563	0.0004	91	247
CG INDEX	682	744	0.9166	0.3749	(913)	2,277
IS INDEX	(1,047)	753	(1.3912)	0.1859	(2,661)	567

Table 34:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Britam Life Insurance Fund

Regression Statistics	
Multiple R	0.9671
R Square	0.9354
Adjusted R Square	0.9031
Standard Error	11,054
Observations	22

ANOVA

	df	SS	MS	F	Significance F
Regression	7	24,759,933,020	3,537,133,289	28.95	0.000000275
Residual	14	1,710,610,207	122,186,443		
Total	21	26,470,543,227			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	(123,880)	56,284	(2.2010)	0.0450	(244,597)	(3,162)
GDP growth rate	65,486	163,383	0.4008	0.6946	(284,936)	415,909
Inflation rate	61,143	96,269	0.6351	0.5356	(145,333)	267,620
Average interest rate	168,056	93,742	1.7928	0.0946	(32,999)	369,112
NSE 20 share index	5	3	1.4876	0.1590	(2)	13
Exchange rate Ksh to US	1,646	447	3.6818	0.0025	687	2,606
CG INDEX	5,214	9,170	0.5686	0.5786	(14,454)	24,882
IS INDEX	(12,085)	9,280	(1.3023)	0.2138	(31,989)	7,819

Table 35: Summary output of the effect of CG, IS, & macroeconomic factors on the performance of CfC holdings

Regression Statistics	
Multiple R	0.9597
R Square	0.9211
Adjusted R Square	0.8816
Standard Error	32,412
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	171,653,909,688	24,521,987,098	23.34	0.00000108
Residual	14	14,707,737,976	1,050,552,713		
Total	21	186,361,647,664			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(336,738)	165,038	(2.0404)	0.0606	(690,709)	17,232
GDP growth rate	547,362	479,076	1.1425	0.2724	(480,155)	1,574,878
Inflation rate	470,996		1.6685		(134,440)	1,076,431

		282,282		0.1174		
Average interest rate	151,548	274,871	0.5513	0.5901	(437,993)	741,088
NSE 20 share index	15	10	1.4848	0.1598	(7)	37
Exchange rate Ksh to US	4,411	1,311	3.3637	0.0046	1,598	7,223
CG INDEX	56,604	26,889	2.1051	0.0538	(1,066)	114,275
IS INDEX	(67,728)	27,211	(2.4890)	0.0260	(126,090)	(9,366)

Table 36: Summary output of the effect of CG, IS, & macroeconomic factors on the performance of CfC Life assurance

Regression Statistics	
Multiple R	0.9646
R Square	0.9305
Adjusted R Square	0.8958
Standard Error	1,240
Observations	22

ANOVA

	df	SS	MS	F	Significance F
Regression	7	288,253,466	41,179,067	26.78	0.000000453
Residual	14	21,529,470	1,537,819		
Total	21	309,782,936			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	(16,459)	6,314	(2.6066)	0.0207	(30,002)	(2,916)
GDP growth rate	22,933	18,329	1.2512	0.2314	(16,379)	62,246
Inflation rate	13,536	10,800	1.2533	0.2306	(9,628)	36,700
Average interest rate	23,653	10,517	2.2491	0.0411	1,097	46,209
NSE 20 share index	0.2825	0.3912	0.7221	0.4821	(0.5565)	1.1214
Exchange rate Ksh to US	198	50	3.9496	0.0015	91	306
CG INDEX	309	1,029	0.3005	0.7682	(1,897)	2,516
IS INDEX	(947)	1,041	(0.9095)	0.3785	(3,180)	1,286

Table 37:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of CIC Life assurance

Regression Statistics	
Multiple R	0.9787
R Square	0.9579
Adjusted R Square	0.9368
Standard Error	2,884
Observations	22

ANOVA

	df	SS	MS	F	Significance F
Regression	7	2,645,996,918	377,999,560	45.46	0.000000015
Residual	14	116,414,185	8,315,299		
Total	21	2,762,411,103			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	(49,677)	14,683	(3.3833)	0.0045	(81,169)	(18,185)
GDP growth rate	43,403	42,622	1.0183	0.3258	(48,012)	134,819
Inflation rate	37,950	25,114	1.5111	0.1530	(15,914)	91,813
Average interest rate	70,761	24,455	2.8936	0.0118	18,312	123,211
NSE 20 share index	1.5928	0.9096	1.7512	0.1018	(0.3580)	3.5437
Exchange rate Ksh to US	592	117	5.0730	0.0002	342	842
CG INDEX	(110)	2,392	(0.0460)	0.9640	(5,241)	5,021
IS INDEX	(1,951)	2,421	(0.8059)	0.4338	(7,143)	3,241

Table 38:Summary output of the effect of CG, IS, & macroeconomic factors on the performance of Jubilee Life assurance

Regression Statistics	
Multiple R	0.9737
R Square	0.9482
Adjusted R Square	0.9223
Standard Error	10,017
Observations	22

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*

Regression	7	25,697,927,663	3,671,132,523	36.59	0.000000061	
Residual	14	1,404,746,463	100,339,033			
Total	21	27,102,674,125				

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	(134,851)	51,005	(2.6439)	0.0193	(244,245)	(25,457)
GDP growth rate	108,911	148,058	0.7356	0.4741	(208,641)	426,463
Inflation rate	85,285	87,239	0.9776	0.3449	(101,824)	272,394
Average interest rate	169,985	84,948	2.0010	0.0652	(12,211)	352,182
NSE 20 share index	5.1431	3.1596	1.6278	0.1259	(1.6335)	11.9198
Exchange rate Ksh to US	1,801	405	4.4440	0.0006	932	2,670
CG INDEX	3,231	8,310	0.3888	0.7033	(14,592)	21,053
IS INDEX	3333(9,532)	8,410	(1.1335)	0.2761	(27,568)	8,505

Tables 25-36 show the study findings of the joint effect of CG index, IS index and macroeconomic factors on performance of other evaluated pension fundsnamely LAPTRUST, KPLC Umbrella, KPLC Individual, Heritage GRP, Heritage Life Insurance Fund, Liberty Life Insurance Fund, Britam Life Insurance Fund, CfC holdings, CfC Life assurance, CIC Life assurance, Jubilee Life assurance and Jubilee Life assurance.The estimated R^2 for the joint effect ranged between 89-97%, compared to the individual effect of CG on respective pension fund values, which varied between 25-67% as indicated by tables 4-9. The joint effect thus explains 89-96% of the variation in the dependent variable, pension funding level compared to the individual effect of CG index that only explained only 25-67%. The joint effect was therefore greater.Moreover, the F values for the joint effect were higher and ranged between 17-47 with p values < .001, indicating that the regression model was statistically significant in predicting the funding levels. In comparison, the individual effect of CG index on pension funding had lower F values ranging between -6.43-37 with p values <.001 with exception of Teleposta pension scheme, F (1,20) = 6.78, p<.05. The findings suggest that the joint effect had more significant models with p values<.001 than the individual effect of CG on pension performance. The models therefore had explanatory power. This implies that the joint effect of CG, IS, & macroeconomic factors on pension fund value is greater than the individual effect of CG.

The study established that the T statistic of the joint effect showed several independent variables were statistically significant in the prediction of fund levels. Their influence however varied with the fund being involved as indicated below:

Table 39: T Statistics

	Scheme	**No. ofSignificant independent variable**	**Significant independent variable**	**Level of Significance**
1.	NSSF	2	NSE 20 share index	T statistic: t = 2.23, p value <.05
			Exchange rate	T statistic: t = 3.33, P value < .05
2.	Teleposta pension scheme	4	Average Interest Rate	T statistic: t = 2.3, p value < .05
			Exchange rate.	T statistic: t = 3.8, p value < .05
			CG index.	T statistic: t = 2.1, p value < .05
			IS index	T statistic: t = -2.4, p value < .05
3.	LAPTRUST	4	Average Interest Rate	T statistic: t = 2.4, p value < .05
			NSE 20 share index	T statistic: t = 2.4, P value < .05
			Exchange rate	T statistic: t = 4.9, p value < .001
			IS index	T statistic: t = -2.1, P value < .05
4.	Kenya Power Company DC	4	NSE 20 share index	T statistic: t = 2.3, p value < .05
			Exchange rate	T statistic: t = 4.2, P value < .001
			CG index	T statistic: t = 2. 3, p value < .05
			IS index.	T statistic: t = -2.6, P value < .05
5.	KPLC (Individual.)	1	Exchange rate	T statistic: t = 4.2, P value < .001.
6.	Heritage (Grp)	3	Inflation rate.	T statistic: t = 2.2, p value < .05
			NSE 20 share index.	T statistic: t = 3.3, p value < .05
			Exchange rate.	T statistic: t = 3.8, p value < .05
7.	Heritage Life insurance Fund	2	NSE 20 share index.	T statistic: t = 2.1, p value < .05

Scheme	No. ofSignificant independent variable	Significant independent variable	Level of Significance
		Exchange rate	T statistic: t = 2.6, p value < .05
8. Liberty Life insurance Fund	3	GDP growth rate	T statistic: t = 2.4, p value < .05
		Average Interest Rate	T statistic: t = 3.4, p value < .05
		Exchange rate	T statistic: t = 4.7, p value < .001
9. Britam Life assurance	1	Exchange rate	T statistic: t = 3.7, p value < .05
10. CFC Holdings	3	Exchange rate	T statistic: t = 3.4, p value < .05
		CG index	T statistic: t = 2.1, p value < .05
		IS index	T statistic: t = -2.5, p value < .05
11. CFC life assurance	2	Average Interest Rate.	T statistic: t = 2.2, p value < .05
		Exchange rate	T statistic: t = 3.9, p value < .001
12. Jubilee Life Insurance fund	1	Exchange rate.	T statistic: t = 4.4, p value < .001
13. CIC life assurance fund	2	Average Interest Rate	T statistic: t = 2.9, p value < .05
		Exchange rate	T statistic: t = 5.1, p value < .001

The study findings suggest that the joint effect of CG index, IS index & macroeconomic variables on pension performance is greater than the individual effect of CG on pension performance in Kenya.

4.4. Conclusion and recommendations

The pension industry in Kenya has undergone tremendous growth since independence to the level that it now manages over Sh1 trillion worth Assets. Despite the operationalisation of the Retirement Benefits Act (RBA) of 1997 and its subsequent amendments to regulate, supervise and promote the retirement benefits schemes, and therefore prevent account holders against losses, the funds are nonetheless still exposed to investment risks that are related with economy as a whole such as market risk/systemic risks and specific risk/unsystematic risks (specific to a particular company or industry).The Markowitz's Modern Portfolio Theory (MPT) is one of the tools used by pension fund managers to manage investment risks. The MPT, a theory of finance on how risk-averse investors attempt to maximize diversification in investing, with the aim of selecting a collection of assets that optimize or maximize expected return based on a given level of market risk, emphasizing that risk is an inherent part of higher reward. This portfolio combination allows investors to utilize risky and un-risky assets.

The study investigated the effect of macroeconomic factors, (GDP growth rate, inflation rate, interest rate, NSE 20 share index, exchange rate), corporate governance, investment strategy on the level of funding of pension funds during the study period of 1997 to 2018. The study findings show that there is a significant relationship between funding level and these factors as shown by the high Pearson's correlation coefficient of >.7, the high R squared and the adjusted R squares values and the low p values. Tables 26-38 show that the entire regression modelson joint effects for the various pension funds were statistically significant in predicting the funding levels because the p values <.001. This suggests that the models had explanatory powern.

The regression coefficients which,isolates the role of one variable from all of the others in the model, established that the level of influence of each individual independent factor on the dependent variable,pension funding level, varied with the scheme being evaluated. The exchange rate was individually significant in the prediction of the the NSSF and Jubilee fund values. Average interest rate and IS index were individually useful in the prediction of the Teleposta fund while exchange rate and average interest rate were significant for the LAPTRUST and the Kenya Power Pension fund (DB). For the case of Kenya Power Pension fund (DC), exchange rate, average interest rate, CG and IS indices were individually significant in the prediction of the fund value. This implies that these factors have a relationship with the financial performance of pension funds and hence the accumulation of retirement benefits.

The study findings suggest that different risk factors in the investment markets, whether systemic or un-systemic need to be taken into consideration when making investment management decisions. The study showsthat there is a variation in the predictor's individual usefulness in the prediction of the fund value. The results imply that knowledge of both systematic and unsystematic risk factors is critical in the management of investments of various pension schemes. Investment management should therefore take into consideration the different risk factors when making investment decisionsguided by the Modern Portfolio Theory (MPT).

The results of this study are significant as they providecritical information concerning key investment risk factors,whether systemic and unsystematic in Kenya to the players in the pension industry, particularly existing or potential members, pension managers, policy makersand the government, to make investment decisions that will determine pension performance. Knowledge of the different types of investment riskswill be critical in mitigation and minimization of risk with portfolio management tools. The investment process is vital in contributing to the generation of adequate pension funds.

The study nonetheless faced a number of challenges during its undertaking. Key among them included lack of data from the pension funds particularly in the early years of study; lack of cooperation and time by management during the administration of the questionnaire; reforms undertaken by some of the funds during the study period. Future issues to consider in similar studies is to utilize monthly or quarterly data returns for both the macroeconomic and funding values rather than the annual figure. To ensure exhaustive study, one could also concentrate of a limited number of pension funds.

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