



Determinants of Pension Fund Performance in Kenya: A Panel Data Approach

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Abstract: A review of pension scheme literature in Kenya reveals limited multi-factor analyses of pension fund performance. This study examines the influence of corporate governance (CG), investment strategy (IS), and macroeconomic factors on the financial performance of pension funds in Kenya over the period 2012–2022. The study adopts a mixed-methods approach that integrates primary CG and IS survey data with secondary macroeconomic data. CG and IS were measured using survey-based indices, while macroeconomic variables were obtained from national datasets. A multi-equation analytical framework was adopted to assess direct, mediating, and moderating effects among the study variables. Statistical analyses included multiple regression, Pearson’s product–moment correlation, and analysis of variance. The findings showed that CG significantly improves pension fund performance, while IS mediates the relationship between governance and financial outcomes. Macroeconomic factors significantly influenced pension fund returns, although their impacts varied across the variables. These results highlight the importance of effective governance structures and sound investment strategies in enhancing the financial sustainability of pension funds. In addition, they imply that macroeconomic factors dictate investment decisions, thereby influencing both the valuation of fund assets and the real value of retirement benefits. The study contributes to the literature by integrating insights from Agency Theory, Stakeholder Theory, Modern Portfolio Theory, and Arbitrage Pricing Theory in explaining pension fund performance within a developing-country context. The findings provide practical implications for pension fund managers and policymakers seeking to strengthen governance practices, optimize investment decisions, and enhance long-term retirement security in Kenya.

Keywords: Corporate governance; Financial performance; Macroeconomic factors; Investment strategy

1. Introduction

The performance of pension funds in Kenya is a growing concern due to their importance in retirement security and stability of the financial system. Pension assets account for about 13% of GDP. Although regulatory reforms by the Retirement Benefits Authority (RBA) in Kenya have improved governance and oversight, some pension schemes continue to underperform. Corporate governance (CG) has emerged as a critical issue following global financial failures, yet evidence of its impact on pension fund performance remains limited and inconclusive. Available empirical evidence worldwide showed that pension fund performance was also influenced by investment strategies and macroeconomic factors. The current study examined the individual and combined effects of CG, investment strategy (IS), and macroeconomic factors on the financial performance of pension schemes in Kenya. The findings contribute to the literature on pension finance and CG by providing integrated evidence in the context of a developing country. It extends Agency Theory, Stakeholder Theory (SHT), Modern Portfolio Theory (MPT), and Arbitrage Pricing Theory (APT) by demonstrating their joint explanatory power for pension fund performance when governance structures, investment behavior, and macroeconomic conditions are examined simultaneously. The findings showed that CG influences performance both directly and indirectly through IS, thus supporting the emphasis of MPT on portfolio decision making as a transmission mechanism. Moreover, the moderating role of

macroeconomic variables lends empirical support to APT in the context of institutional investors. By revealing the complementarity of these theories, the study advanced a holistic theoretical framework for understanding pension fund performance in emerging markets.

1.1 Corporate Governance

CG has gained increasing prominence due to its central role in shaping the operational frameworks and strategic direction of firms (Garzón Castrillón, 2021). This evolution emphasizes core governance principles of transparency, accountability, fairness, and ethical conduct, which are essential for fostering stakeholder trust and improving organizational performance.

Although no universally accepted definition of CG exists, scholars broadly view it as the system through which organizations are directed and controlled. Carmichael & Palacios (2003) described governance as the processes through which organizations achieved objectives while managing conflicts among stakeholders. As regards pensions, the International Organization of Pension Supervisors (IOPS) defined governance as the framework guiding board structures, processes of decision making, competencies, and accountability mechanisms (IOPS, 2009). These principles have been widely promoted by institutions such as the Group of Twenty (G20)/Organization for Economic Co-operation and Development (OECD) (OECD, 2009) to support financial stability and sustainable economic growth.

Prior literature established that effective CG influenced the behavior and performance of firms, as well as investors' confidence by reducing managerial opportunism and agency problems (Chow, 2005; Shleifer & Vishny, 1997). Governance is particularly critical in pension schemes due to their fiduciary responsibilities and long-term obligations. High-profile failures including the Asian financial crisis and the Enron collapse, as well as pension fund scandals have highlighted the risks associated with weak governance structures (Stewart & Yermo, 2008). Pension fund performance has, however, remained mixed. There are concerns about their capacity to meet future liabilities (Impavido, 2002), despite the implementation of governance regulation measures which aim at mitigating conflicts of interest and protecting pension security. Empirical evidence consistently demonstrated that sound governance improved pension fund performance by enhancing the enforcement of contracts, reducing the exposure to risks, and aligning managerial incentives with beneficiaries' interests (Ambachtsheer, 2001; Ambachtsheer et al., 2006; Eisenhardt, 1989; Useem & Mitchell, 2000).

To address governance weaknesses, policymakers have introduced legal, regulatory, and voluntary measures. In the United States, the Sarbanes–Oxley Act of 2002 strengthened financial reporting and accountability. In Kenya, the RBA Act, Cap 197 of 1997, established governance standards for pension schemes, complemented by governance codes developed by the State Corporations Advisory Committee (PSC & SCAC, 2015). Despite these reforms, governance weaknesses persist and lead to underperformance of pension funds as well as the occurrence of additional factors affecting pension fund performance.

1.2 Investment Strategy

IS refers to a systematic approach to portfolio selection that aligns investment objectives with acceptable levels of risk and return, taking into account investors' goals, tolerance of risks, time horizon, and prevailing economic conditions (Bilau, 2010). As a central element of portfolio management, IS is critical to the performance and long-term sustainability of pension funds, representing a substantial segment of the global investment industry (Tonks, 2006).

Pension fund investments are, however, exposed to multiple risks, including market, inflation, credit, solvency, governance, and regulatory risks; all of which may undermine the adequacy of retirement income (Obermann, 2005). IS provides a key mechanism for managing these risks, while enhancing expected returns through appropriate strategies such as diversification, active and passive management, allocation of strategic assets, portfolio limits, indexing, market timing, and international investment and risk control (Urwin, 2010). Given differences in risk appetite, return objectives, and liability structures, no single IS is universally applicable across pension schemes.

International best practice, as promoted by the OECD and the Committee of European Insurance and Occupational Pension Supervisors, emphasizes the adoption of a written investment policy statement aligned with legal and regulatory frameworks. Such policies define investment objectives, classes of permissible assets, performance benchmarks, and guidelines for appointing and monitoring fund managers. The regulatory environment significantly influences IS adopted and is closely linked to the developmental level of capital market. While underdeveloped markets often impose quantitative investment restrictions, more advanced systems rely on the prudent person rule, which emphasizes fiduciary responsibility and risk management (Antolin, 2008; Tapia, 2008). Weaknesses in risk management frameworks were evident during the global financial crisis and contributed to poor pension fund performance (Stewart, 2009). Despite pension assets in Kenya and significant contribution to GDP, empirical evidence on the relationship between pension fund IS and performance remains limited.

1.3 Macroeconomic Factors

Macroeconomic factors are broad economic, financial, and geopolitical conditions that influence the overall economic performance and remain largely beyond the control of individual firms (Fischer, 1993; Flannery & Protopapadakis, 2002). These factors include GDP growth, inflation, interest rates, exchange rates, money supply, unemployment, and geopolitical events, and are closely monitored by investors and policymakers due to their pervasive impact on financial markets (Sharan, 2009).

Khaparde & Bhute (2014) aver that investment and financing decisions were shaped by prevailing macroeconomic conditions, as investors incorporated macroeconomic information into the construction of portfolios to optimize risk-adjusted returns. In concurrence, Kahraman (2011) as well as Liu & Pang (2009) suggested that economic uncertainty and adverse macroeconomic shocks might reduce investment activities and lead to underinvestment.

The relationship between macroeconomic variables and asset returns was theoretically grounded in the APT, which posits that security returns are influenced by multiple macroeconomic factors such as GDP growth, inflation, interest rates, and exchange rates (Ross, 2013). Empirical evidence from both the developed and emerging markets confirmed that macroeconomic variables significantly affected stock market and firm performance (Bodie et al., 1988; Clare & Thomas, 1994; Humpe & Macmillan, 2009; Kwon & Shin, 1999; Pilinkus, 2010). In Kenya, studies documented a significant relationship between firm performance and movements in the Nairobi Securities Exchange index (Ochieng & Oriwo, 2012; Olweny & Omondi, 2011). Macroeconomic indicators are therefore critical considerations for pension funds, yet empirical studies examining their impact on pension funding and performance in Kenya remain limited.

1.4 Pension Schemes in Kenya

A pension scheme, financed through employer and/or employee contributions, is a long-term social protection arrangement to generate retirement benefits for the provision of income security in old age or in the event of disability or death. These schemes, therefore, act as major institutional investors, mobilizing long-term savings and reallocating them to support investment and consumption in the wider economy. They are classified along functional or institutional dimensions, resulting in public or private, occupational or personal, Defined Benefit or Defined Contribution, and funded or unfunded arrangements.

This study focused on occupational pension schemes, which are funded employer-sponsored arrangements established under trust law to provide retirement benefits to employees. These schemes may be mandatory or voluntary and may adopt Defined Benefit, Defined Contribution, or provident fund structures (Bodie et al., 1988). Despite their importance, these schemes face significant uncertainty related to investment performance and long-term funding sustainability. Because pension assets are managed by trustees on behalf of beneficiaries, governance is central to scheme performance. Limited beneficiary control over fund management intensifies agency problems, hence highlighting the need for effective governance mechanisms to enhance oversight, accountability, and the protection of members' interests (Besley & Prat, 2005).

The pension system in Kenya is structured into four main pillars regulated by the RBA: the Public Service Pension Scheme, the National Social Security Fund (NSSF), occupational pension schemes, and individual pension plans. The Public Service Pension Scheme is a contributory arrangement for public servants, with the government contributing 15% and employees contributing 7.5% of their basic salary. The NSSF is a mandatory national scheme covering workers in both formal and informal sectors under the NSSF Act, 2013 while occupational pension schemes are employer-sponsored arrangements that may operate as standalone schemes or within umbrella schemes, enabling smaller employers to pool resources and reduce administrative and compliance costs. Individual pension plans cater to self-employed individuals and those without access to employer-sponsored schemes, to offer flexible contributions and tax incentives.

As at December 2022, Kenya had 1,302 registered retirement benefits schemes, of which 1,268 were occupational pension schemes and 34 were individual pension plans. A substantial share of occupational schemes participates in 26 umbrella schemes. The sector has expanded rapidly, with retirement benefits assets under management increasing from KSh 697 billion in December, 2013 to KSh 1,167 billion in June, 2018 (RBA, 2018).

Prior to 1997, the pension sector in Kenya was largely unregulated, thus limiting its effectiveness as a social protection and savings mobilization mechanism. This led to the enactment of the RBA Act, Cap 197 of 1997, which established the RBA to regulate, supervise, and promote the orderly development of the pension sector, strengthen governance, enhance member protection, and support long-term sustainability.

1.5 Research Questions

Over the past two decades, crises in the regional market and major corporate failures have highlighted the importance of effective pension governance in safeguarding retirement savings. Events such as the 1997 Asian

Financial Crisis, the 2008 Global Financial Crisis, and high-profile corporate scandals exposed governance weaknesses that undermined the ability of pension funds to preserve and grow assets, thus intensifying agency problems among fund managers, trustees, and beneficiaries. While governance reforms were initiated globally following these events, their impact on pension fund performance remained inconclusive.

Challenges persist in Kenya despite the enactment of the RBA Act of 1997. Cases of asset misappropriation, weak oversight, and poor transparency, which threaten the sustainability of occupational pension funds, were witnessed in schemes such as Kenya Medical Research Institute, NSSF, and Kenya Ports Authority pension schemes. Their performance was further compounded by volatile macroeconomic conditions and investment strategies.

Existing studies largely drawn from developed economies, despite inconsistent findings, suggested that good governance and sound investment strategies could enhance fund performance. Research in Kenya is limited, sector-specific, and rarely considers the combined effects of governance, IS, and macroeconomic factors. To address this gap, the study investigated the individual and the joint effect of these factors on pension fund performance, to provide evidence to strengthen governance, optimize investments, and ensure sustainable retirement outcomes in a developing economy context.

1.6 Research Objectives

The main objective of this study is to assess the relationship between the financial performance of occupational pension funds and the factors like CG, IS, and macroeconomic variables in Kenya for the period 2012–2022. Specifically, the study sought to:

- i) Examine the effect of CG on the market value of occupational pension funds;
- ii) Determine the moderating role of IS in the relationship between CG and the financial position of occupational pension funds;
- iii) Assess the influence of selected macroeconomic variables on the relationship between CG and the financial position of occupational pension funds; and
- iv) Evaluate the combined effect of CG, IS, and macroeconomic factors on the financial position of occupational pension funds.

2. Literature Review

2.1 Theoretical Foundation of the Study

This study was anchored on Agency Theory as the founding theory, supported by SHT, MPT, and APT. Collectively, these theories provided a comprehensive framework for explaining the relationship among CG, IS, macroeconomic factors, and the financial performance of occupational pension funds.

2.1.1 Agency Theory

Agency Theory (Jensen & Meckling, 2019) explains the contractual relationship between principals (contributors and beneficiaries) and agents (trustees and fund managers) who are delegated decision-making authority. The theory posits that agents may pursue self-interests that diverge from those of principals, due to differences in objectives, risk preferences, and information asymmetry. As a result, the arising agency costs may adversely affect organizational performance.

Agency Theory therefore predicts that governance mechanisms such as effective monitoring, accountability structures, and incentive alignment play a critical role in mitigating agency conflicts and enhancing performance. Eisenhardt (1989) emphasized that optimal contracts and monitoring systems were central to aligning principal–agent interests, while Jensen & Meckling (2019) as well as Maher & Andersson (2002) argued that well-designed governance structures improved organizational value.

Pension funds are particularly susceptible to agency problems due to the separation of ownership and control, limited participation of beneficiaries, and reliance on professional managers. Weak governance increases the likelihood of opportunistic behavior, inefficient investment decisions, and underperformance. Conversely, strong governance mechanisms enhance accountability and efficiency, leading to improved financial outcomes.

Although Agency Theory has been criticized for its narrow focus on shareholder interests and limited contextual applicability (Aguilera et al., 2008), it remains highly relevant to the analysis of pension funds. The theory provides a clear theoretical foundation for hypothesizing that CG structures significantly influence the financial performance of occupational pension funds.

2.1.2 Stakeholder Theory

SHT provides a relevant framework for analysing the governance of pension funds, as they operate within a complex nexus of stakeholders, including contributors, beneficiaries, trustees, fund managers, regulators, and

sponsoring employers (Freeman, 2010). The theory suggests that effective governance structures should balance these interests to enhance accountability, reduce problems of agency, and support financial sustainability in the long run (Blair, 1995; Donaldson & Preston, 1995).

Strong governance practices in the operation of pension funds, such as transparent decision making, independent trusteeship, and regulatory oversight are expected to align managerial actions with stakeholders' interests, thereby improving fund performance. Accordingly, SHT underpins the hypothesis that pension funds with stronger governance mechanisms are more likely to achieve superior financial performance, due to enhanced protection and trust of stakeholders. However, the theory also acknowledges potential limitations, including difficulties in reconciling conflicting objectives of stakeholders and the risk of exercising managerial discretion without explicit performance benchmarks (Blair, 1995; Friedman, 2007; Heath & Norman, 2004).

2.1.3 Modern Portfolio Theory

MPT (Markowitz, 1952) provides the theoretical basis for linking IS to pension fund performance through diversification and risk–return optimization. The theory posits that efficient portfolios are achieved through optimal asset allocation across imperfectly correlated assets, thereby managing both systematic and unsystematic risks (Lintner, 1965; Sharpe, 1964).

For occupational pension funds, effective implementation of MPT principles depends critically on governance quality. Sound CG aligns the decisions of trustees and fund managers with the long-term objective of beneficiaries, to promote prudent asset allocation and diversification. Conversely, weak governance may result in suboptimal investment strategies and excessive risk exposure. Accordingly, MPT complements Agency Theory by explaining the mechanism through which CG influences financial performance, thus providing theoretical justification for the hypothesis of savings mobilization mechanism in which IS mediates the relationship between CG and pension fund performance.

2.1.4 Arbitrage Pricing Theory

APT (Ross, 2013) posits that expected asset returns are determined by multiple systematic risk factors which reflect underlying macroeconomic conditions. The theory emphasizes that diversification cannot fully eliminate exposure to economy-wide risks, rendering asset performance sensitive to macroeconomic fluctuations. Empirical evidence supported the relevance of APT in institutional investment contexts. Studies by Chen et al. (1986) and Roll & Ross (1980) revealed that macroeconomic variables such as GDP growth, inflation, and movements of interest rate significantly influenced asset returns. For pension funds, which are long-term and diversified institutional investors, these systemic factors directly affect portfolio returns and overall financial performance.

Although APT does not specify the exact risk factors to include and is sensitive to model specification (Cheng, 1996; Huberman, 1982), it remains a robust framework when appropriately applied. Accordingly, this study adopted APT to examine how macroeconomic conditions influenced pension fund performance, and how structures of CG and investment strategies shaped the transmission and management of these risks.

2.2 Empirical Literature Review

2.2.1 Corporate governance and pension performance

Research on CG research is largely concentrated in the United States and OECD countries, where strong shareholder rights, effective legal systems, and independent boards are linked to higher firm value and improved performance (Gompers et al., 2003; La Porta et al., 2002; Lombardo & Pagano, 1999). Sound CG practices, particularly board independence and oversight, are also associated with enhanced pension fund performance (Besley & Prat, 2005; Yang & Mitchell, 2005; Zahra & Pearce, 1989).

Evidence on the CG–performance nexus is mixed. Some studies reported positive effects, while others discovered weak or inconclusive relationships due to methodological differences, measurement challenges, and mediating factors such as ownership structure, board composition, and institutional context (Coles et al., 2008; Daines & Klausner, 2001; Larcker et al., 2007; Renders et al., 2010). Moreover, CG mechanisms alone have sometimes failed to prevent corporate collapses and crises (Clarke, 2009).

In emerging markets, firm-level CG practices are particularly critical for improving financial outcomes and reducing information asymmetry, wherever protection of shareholders is weak (Klapper & Love, 2002). Evidence from Africa, though limited, shows similar patterns: ownership concentration, board independence, and quality of audit committee significantly influence firm performance (Darko et al., 2016; Ehikiyoa, 2009).

In Kenya, studies on CG and pension funds remain sparse. Available evidence suggested that the composition and size of board as well as executive compensation affect pension fund performance (Mutegi & Gachunga, 2014), while CG practices supported scheme growth and regulatory compliance (Njuguna, 2011). Research on listed firms and state agencies further indicated that ownership concentration, board composition, and meeting frequency enhanced firm performance (Lishenga, 2011; Miring'u & Muoria, 2011; Ongore & K'obonyo, 2011). While CG is crucial for organizational and pension performance, gaps remain in the Kenyan context, particularly regarding

its interaction with IS and macro-institutional factors, thus underscoring the need for context-specific and comprehensive studies.

2.2.2 Corporate governance, investment strategy, and pension performance

Empirical evidence suggested that CG shaped investment decisions and pension fund performance, though findings were mixed. In emerging markets, Khanna & Zyla (2012) reported that investors valued well-governed firms and paid premium prices, yet the role of trustees in investment decisions remained unexplored. In contrast, Useem & Mitchell (2000) concluded no direct CG-performance link but demonstrated that governance influenced IS, which in turn improved pension fund financial outcomes, implying an indirect effect on market value.

Developed market studies reinforced this relationship. Ammann & Ehmann (2017) observed a weak but positive association among CG, asset allocation, and market value in Swiss occupational pension plans. Ambachtsheer et al. (1998) similarly showed that governance quality enhanced investment decisions and fund performance. In Poland, trustee board characteristics such as composition, education, and age significantly affect the market value of defined contribution funds (Jackowicz & Kowalewski, 2012), to highlight the importance of robust governance practices. Evidence on investment regulation further underscored the interaction of governance and strategy. Davis & Hu (2008) attributed Canadian pension fund underperformance relative to the UK and US to portfolio restrictions, while Ippolito & Turner (1987) noted persistent underperformance of the US funds against market benchmarks, consistent with the Efficient Markets Hypothesis.

Available literature focused on developed economies and examined governance, IS, and performance discretely. The lack of comparable research in developing countries including Kenya, alongside differences in the structures of capital market, motivated this study to investigate the combined effects of governance and IS on pension fund performance.

2.2.3 Corporate governance, macroeconomic factors, and pension performance

Empirical evidence on the determinants of pension fund returns was largely indirect, as most studies focused on the securities in which funds invested rather than the funds themselves. Research in developed and emerging markets showed that macroeconomic variables significantly influenced stock performance. For example, studies by Black et al. (1997), Chen (1991), Humpe & Macmillan (2009), and Kwon & Shin (1999) highlighted the effects of real gross national product, industrial production, lagged inflation, and interest rates on stock returns.

Muhammad et al. (2002) found that interest rates positively affected stock returns in Bangladesh and Sri Lanka but had no significant impact in India and Pakistan. Singh (2010) reported positive associations among exchange rates, industrial production, and inflation with the Bombay Stock Exchange Sensex, though only industrial production exhibited bilateral causality. In Kenya, Olweny & Omondi (2011) and Ochieng & Oriwo (2012) found positive links between the Nairobi Securities Exchange All Share Index and macroeconomic indicators, while Wanjiku (2014) confirmed that pension fund performance was influenced by selected macroeconomic variables, to suggest that Kenyan asset prices did not fully reflect available information.

Despite this extensive literature, no study had simultaneously examined the combined effects of CG, macroeconomic variables, and IS on pension fund performance. Addressing this gap motivated the present study.

2.2.4 Empirical evidence on the joint effect of corporate governance, investment strategy, and macroeconomic factors on pension performance

Empirical research that examined the joint effect of CG, IS, and macroeconomic factors on pension fund performance remained limited in both developed and emerging markets. Prior studies often reported mixed or contradictory findings, which many authors attributed to analyses that considered only one or two variables at a time and therefore omitted important confounding factors. To address this gap, the present study adopted a multifactor framework that simultaneously modelled CG, IS, and macroeconomic determinants to assess their combined and interactive effects on the financial performance of occupational pension funds in Kenya. By estimating multi-variable and interaction models on panel data, the study aims to provide more robust evidence on how governance and choices of investment condition pension outcomes under varying macroeconomic environments.

2.2.5 Conceptual framework

The conceptual framework for this study is grounded in several complementary theoretical perspectives, including Agency Theory, MPT, Capital Asset Pricing Model, SHT, and APT. These theoretical foundations collectively provide a comprehensive framework for examining the relationship between CG, IS, macroeconomic variables, and the financial performance of pension funds. The framework as shown in Figure 1 therefore illustrates the hypothesized relationships among the study variables and provides a systematic structure for understanding how governance mechanisms, strategic investment decisions, and macroeconomic conditions interact to influence pension fund performance.

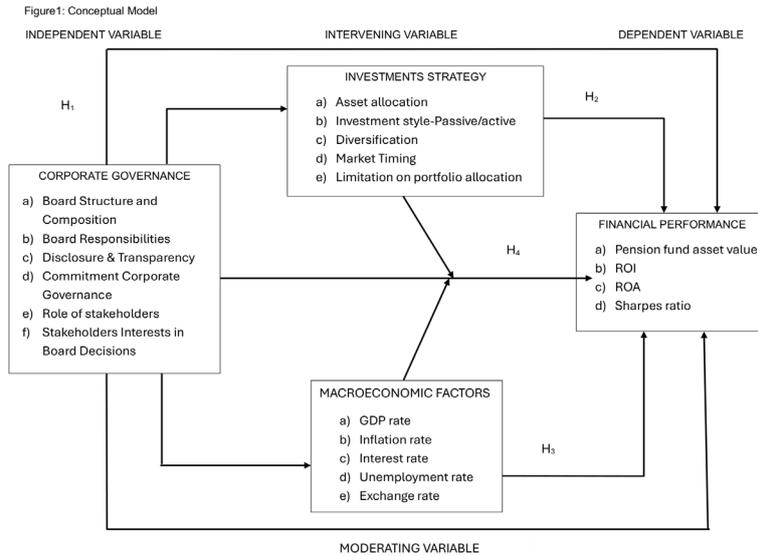


Figure 1. Conceptual model

2.2.6 Hypotheses

The proposed study tested the below hypotheses in Kenya:

- i) H_1 : Good CG is positively associated with pension fund financial performance.
- ii) H_2 : IS has significant intervening influence on the link between governance and market value of occupational pension plans.
- iii) H_3 : Macroeconomic shocks have significant moderating effect on the link between governance and pension fund financial performance.
- iv) H_4 : The joint effect of CG, IS, and macroeconomic variables has a significant relationship on pension fund financial performance.

3. Methodology

3.1 Research Design

Research design provides the overarching framework guiding data collection, measurement, and analysis in addressing a research problem (Zikmund, 2003). Following the classification of Creswell in 2008, this study adopted a mixed-methods research design to empirically and conceptually examine the relationship among CG, IS, and pension fund performance.

The qualitative component employed in-depth interviews and document reviews to examine how CG structures and investment strategies influenced the financial position of pension schemes. This approach emphasized understanding participants' perceptions and decision-making processes through non-numerical data (Neuman, 2006). Using structured interview guides, data were collected from key informants and relevant institutional documents. Qualitative findings were primarily descriptive and could inform the construction of the CG index and IS index used in subsequent quantitative analysis.

The quality of CG of Kenyan pension funds was measured by the Kenya Pension Fund Governance Index, constructed in line with the revised OECD Principles of Corporate Governance (OECD, 2015). The index captures multiple dimensions of governance quality through eight sub-indices: (i) foundations for management and oversight; (ii) board structure and composition; (iii) board responsibilities; (iv) board procedures; (v) shareholders' rights; (vi) disclosure and transparency; (vii) commitment to CG; and (viii) the role of stakeholders. Each governance dimension was operationalized by a set of survey items designed to reflect compliance with the relevant OECD principles. Respondents evaluated each item with a five-point Likert scale, ranging from -3 (strongly disagree) to +3 (strongly agree). Given the ordinal nature of Likert-scale data, the median score was used as the measure of central tendency for each governance indicator. If G_{ij} denotes the median score for governance indicator j within sub-index i , where $i = 1, \dots, 8$ and $j = 1, \dots, n_i$. Each governance sub-index SG_i was computed as the unweighted average of its constituent indicators:

$$SG_i = \frac{1}{n_i} \sum_{j=1}^{n_i} G_{ij} \quad (1)$$

The overall CG Index for fund k was then constructed as the arithmetic mean of the eight sub-indices:

$$KPGI_k = \frac{1}{8} \sum_{i=1}^8 S G_{ik} \quad (2)$$

The aggregation approach assumes equal importance across governance dimensions, consistent with prior construction of CG index in empirical finance literature.

The effectiveness of pension fund investment strategies was measured by an IS survey questionnaire administered to key pension fund staff. IS was modeled as a unidimensional construct capturing the extent to which investment practices supported fund growth and performance. Respondents evaluated IS indicators using the same five-point Likert scale ranging from -3 (strongly disagree) to +3 (strongly agree). Consistent with the treatment of ordinal data, the median score was used to summarize responses for each indicator. If IS_j denotes the median response for IS indicator j , where $j = 1, \dots, m$. The IS index for fund k was computed as:

$$ISI_k = \frac{1}{m} \sum_{j=1}^m IS_{jk} \quad (3)$$

The resulting index, used as an explanatory and mediating variable in the empirical analysis, provides a composite measure of the relative effectiveness of investment strategies employed by Kenyan pension funds.

The quantitative component focused on measuring the magnitude and direction of relationships among study variables using statistical techniques (Creswell, 2009). Descriptive design was employed to examine performance trends and validate prevailing conditions. Correlational design tested associations between CG structures, IS, and pension fund market value, while a developmental (longitudinal) design captured changes over time in line with fourth hypothesis which incorporated macroeconomic dynamics.

Quantitative data included pension fund performance indicators, the Nairobi Securities Exchange (NSE) 20 Share Index, inflation, interest rates, exchange rates, and GDP growth. Collectively, descriptive, correlational, survey, and developmental designs were integrated to rigorously test the study hypotheses.

3.2 Population of the Study

The research population comprised 1,306 public and private occupational pension funds registered with the RBA, as at 31st December 2022, and was organised as either individual or umbrella pension schemes. The unit of analysis was each one of the individual or umbrella pension funds.

3.3 Sample of the Study

The study used a random sampling method to produce results that could be generalized to the population. Sample size was estimated using Cochran's sample size formula (1963:75): $n_0 = Z^2 pq / e^2$, where n_0 is the sample size; Z^2 is the critical value of the normal distribution at $\alpha/2$, 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 was informed by the fact that major CG practices were affected during that time, to provide a scope to evaluate the influence of CG as well as IS and macroeconomic factors on pension fund financial position. The sample for the study was obtained from a population of 73 pension schemes registered by the RBA as at 31st December 2020 and it comprised 41 individual pension schemes and 32 umbrella pension schemes. The sample data for the study was estimated using Cochran's sample size formula (1963:75) to 61 pension schemes. The sample size of the proposed study was estimated using the formula: $n_0 = Z^2 pq / e^2$, where $N = 73$, the population size; $e = 0.05$, margin of error; $\hat{\sigma}_p = 0.5$, the standard deviation of the population; and $Z = 1.96$ at 95% confidence level.

To produce results that could be generalized to the population, random sampling method was applied. Nonetheless, adequate data for 57 pension schemes was accessed, representing a success rate of $57/61 = 93.443\%$. The sample of 57 pension schemes yielded 513 observations for the study period 2012–2020. Due to the lack of some data, observations for pension schemes varied from 1 year to the maximum of 9 years. The mean observations were 7.281 for each pension firm, reflecting 80.9% of the observations of total sampled pension schemes, thus yielding a balanced panel dataset.

3.4 Data Collection

The study utilised both primary and secondary data; they comprised time-series and cross-sectional observations

covering the period of 2012–2022, a phase characterised by significant pension regulatory reforms in the sector. Data were obtained from multiple sources to enhance reliability and validity.

Secondary quantitative data on the monthly value of pension fund assets and investment returns were sourced from individual record of pension funds, annual reports, and archival documents. Macroeconomic data on GDP, inflation, and foreign exchange rates were obtained from market surveys, annual reports, and publications of the Central Bank of Kenya (CBK) and the Kenya National Bureau of Statistics. Data on the NSE 20 Share Index, corporate bond yields, and Treasury bill rates were sourced from the Capital Markets Authority.

Primary data were collected to construct CG and IS indices. Qualitative data was gathered through structured survey questionnaires administered to pension schemes and subsequently analysed to generate quantitative indices. The CG index, used as a proxy for the effectiveness of governance mechanisms, was developed by incorporating governance structures and practices as inputs, and governance standards drawn from established codes of best practice as output. The respondents of the survey comprised key stakeholders with direct knowledge of scheme governance and investment activities, including sponsor-appointed and member-elected trustees, corporate trustees, scheme administrators, fund managers, custodians, actuaries, and other relevant officers within the pension schemes.

3.5 Tests for Reliability and Validity

Reliability and validity are fundamental criteria for assessing the quality and rigor of research instruments. They indicate the extent to which a method, technique, or test consistently and accurately measures the intended phenomenon.

Reliability is defined as “the degree of consistency with which an instrument measures an attribute” (Hugler, 1987). Similarly, De Vos (1998) described reliability as the extent to which the application of a specific research instrument in a different study yielded equivalent results under comparable conditions. Cronbach (1951) further conceptualized reliability as the degree to which a set of measurement items were closely related as a group, so as to emphasize internal consistency. Collectively, these definitions highlighted the concepts of repeatability and replicability of research findings. Joppe (2000) reinforced this view by arguing that a research instrument was considered reliable if the study findings could be reproduced under similar conditions. In this regard, reliability refers to the consistency or stability of a measurement over time.

In quantitative research, reliability is commonly estimated using Cronbach’s alpha coefficient, which ranges from 0 to 1. In this study, the test–retest method was employed to assess the reliability of the questionnaires on CG and IS. The instruments were administered to management personnel of selected independent pension funds and re-administered after an interval of one month. The responses obtained at Time 1 and Time 2 were then compared to determine the consistency of the measures over time.

Validity, on the other hand, refers to the extent to which an instrument accurately measures the concept it purports to measure (Phelan & Wren, 2006). It assesses the truthfulness and meaningfulness of research results and is concerned with the presence or absence of systematic measurement errors (Campbell & Stanley, 2015). Systematic error evaluates how well the results align with established theories and other measures of the same construct.

3.6 Diagnostic Tests

Model diagnostics assess the goodness of fit of an econometric model and, where necessary, the identification of appropriate corrective measures. These tests are applied to evaluate model residuals, which serve as indicators of overall model adequacy. The tests are designed to examine the dependence and error structure of a time series or regression model. If a time series is serially uncorrelated, no linear function of lagged variables could explain the behaviour of the current variable. In this study, model diagnostics focused on testing for multicollinearity, heteroscedasticity, and homoscedasticity, which were critical assumptions underpinning classical linear regression models (Schulzer, 1994).

3.7 Data Analysis

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

$$\text{Pension Financial Performance} = a + b_1(\text{CG}) + b_2(\text{IS}) + b_3(\text{Macro}) + e \quad (4)$$

where, a = the predicted value of the dependent variable when all predictors are zero; b_1 , b_2 , and b_3 = regression coefficients that represent the average change in the predicted value of the dependent variable for a one-unit increase in the corresponding predictor, assuming all other variables remain fixed; CG = Corporate Governance; IS = Investment Strategy; Macro = Macroeconomic factors; e = error term. Below are the regression models and the hypotheses tested.

3.7.1 Data presentation and analysis

This section presents the analysis and empirical results of the study. The chapter examines the moderating variables, represented by macroeconomic factors, the mediating variable, IS, and the outcome variable, pension fund financial performance measured by the combined return on investment (ROI) of pension funds. In addition, the section presents trend analysis and diagnostic tests, culminating in a summary of the key findings. The study covered the period from 2012 to 2022, with data obtained from the pension industry in Kenya and national economic indicators.

4. Testing of the Hypotheses and Discussion of the Findings

4.1 Path Analysis/Stepwise Regression Analysis

Step 1:

$$Y = a_0 + \beta_1 X_1 + \varepsilon \quad (5)$$

Step 2:

$$Me = a_0 + \beta_1 X_1 + \varepsilon \quad (6)$$

Step 3:

$$Y = a_0 + \beta_2 Me + \varepsilon \quad (7)$$

Step 4:

$$Y = a_0 + \beta_2 Me + \beta_1 X_1 + \varepsilon \quad (8)$$

where, Y = composite score for financial performance; a_0 = regression constant; X = composite score for CG indicator; Me = mediating factor composite score for IS; R^2 = Pearson's product moment correlation R .

4.1.1 Step 1: Testing the effect of corporate governance indicators on the combined ROI of pension funds

Step 1: $Y = a_0 + \beta_1 X_1 + \varepsilon$

H_1 : CG has a significant relationship with the combined ROI of pension funds in Kenya.

Step 1 of the mediation analysis examined the direct effect of CG on the combined ROI of pension funds, excluding the mediator–IS index from the regression model. The results presented in Table 1 indicate that the coefficient of determination (R^2) for the overall model was .362, with an adjusted R^2 of .271. This suggests a weak size effect. Hagerty & Srinivasan (1991) observed that those values below .3 indicated weak effects, while those between .3 and .5 indicated moderate effects, and values above .7 indicated strong effects. This indicated that approximately 36.2% of the variance in the combined ROI could be explained by the regression model, which comprised a linear combination of the CG indicators: board structure and composition, board responsibilities, shareholders' rights, disclosure and transparency, commitment to CG, role of stakeholders, and stakeholders' interests in board decisions. This implies that while these CG factors do influence financial performance, the majority of the variation, approximately 63.8%, is likely driven by other external or internal factors not included in this specific regression.

The adjusted R^2 of .271 further refined this by accounting for the number of predictors in the model, suggesting that the actual explanatory power of the model is lower than the raw R^2 .

The ANOVA results shown in Table 2 reveal that the overall regression model was statistically significant, $F(7, 49) = 3.977, p < .05$, indicating that the set of independent variables reliably predicted the dependent variable, i.e., the combined ROI of pension funds. The research findings indicate that strong governance frameworks defined by board composition, transparency, and accountability correlate with better financial outcomes in the pension funds in Kenya. Thus, CG significantly influences pension fund performance by aligning the interests of fund managers with those of beneficiaries, in order to reduce agency costs, and improve the efficiency of investment.

Table 1. Model 1 summary of the effect of corporate governance (CG) on the combined return on investment (ROI) of pension funds in Kenya

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				<i>R</i> ² Change	<i>F</i> Change	<i>df</i> ₁	<i>df</i> ₂	Sig. <i>F</i> Change	
.602 ^a	.362	.271	43.63799	.362	3.977	7	49	.002	1.993

Note: a. Predictors: (Constant), stakeholders' interests in board decisions, board structure and composition, commitment to CG, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities.

Table 2. ANOVA^a of the relationship between corporate governance (CG) and the combined return on investment (ROI) of pension funds (Model 1)

Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Regression	53017.341	7	7573.906	3.977	.002 ^b
Residual	93309.450	49	1904.274		
Total	146326.791	56			

Note: a. Dependent variable: combined ROI of pension funds. b. Predictors: (Constant), stakeholders' interests in board decisions, board structure and composition, commitment to CG, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities.

Findings from the coefficient estimates in Table 3 showed that only the Role of stakeholders was a statistically significant predictor ($t = 2.143$, $p < .05$), showing a positive effect on the combined ROI of pension funds. Therefore, effective stakeholder involvement plays a critical role in enhancing pension fund performance. This implies that in Kenya, pension funds that broaden the focus of boards to include all the stakeholders as postulated by the SHT could help improve long-term sustainability and risk management, leading to more stable returns.

Table 3. Coefficient of the relationship between corporate governance (CG) and the combined return on investment (ROI) of pension funds (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Correlations			Collinearity Statistics	
	<i>B</i>	Std. Error	Beta			Zero-Order	Partial	Part	Tolerance	VIF
(Constant)	-35.689	22.902		1.558	.126					
Board structure and composition	53.518	69.951	.256	.765	.448	.366	.109	.087	.116	8.621
Board responsibilities	66.058	54.893	-.326	1.203	.235	.245	-.169	-.137	.178	5.631
Shareholder's rights	15.084	25.867	-.075	-.583	.562	-.170	-.083	-.067	.792	1.263
Disclosure and transparency	46.419	43.249	.230	1.073	.288	.302	.152	.122	.283	3.538
Commitment to CG	-9.610	15.185	-.074	-.633	.530	-.133	-.090	-.072	.959	1.043
Role of stakeholders	95.770	32.643	.421	2.934	.005	.539	.387	.335	.632	1.582
Stakeholders' interests in board decisions	25.162	20.104	.147	1.252	.217	.200	.176	.143	.945	1.058

Note: VIF = Variance Inflation Factor

In addition, the results revealed that the other variables were statistically insignificant predictors. Board structure and composition, Disclosure and transparency, and Stakeholders' interests in board decisions had positive effect, $p > .05$ while board responsibilities, shareholders' rights, and commitment to CG had negative effect with $p > .05$. Taking into account the levels of statistical significance, the parsimonious predictor model for the combined ROI of pension funds is therefore specified as:

$$\text{Combined ROI} = \beta_0 + \beta_1(\text{Role of stakeholders}) + \varepsilon \quad (9)$$

where, β_0 is the constant term, β_1 represents the coefficient of the role of stakeholders, and ε is the error term.

Based on the regression coefficients, the predictive model, nonetheless, is specified below:

$$\text{Combined ROI of Pension Funds} = -35.689 + 53.518(\text{BS\&C}) - 66.058(\text{BR}) - 15.084(\text{SR}) + 46.419(\text{D\&T}) - 9.610(\text{CCG}) + 95.770(\text{RS}) + 25.162(\text{SIBD}) \quad (10)$$

The implication of ANOVA in Table 3 indicates that the relationship between CG indicators and the combined ROI of pension funds is significant with $F(7, 49) = 3.977, p < .05$, so that it enables one to proceed to step 2.

4.1.2 Step 2: Testing the relationship between corporate governance indicators and investment strategy index

Step 2: $Me = a_0 + \beta_1 X_1 + \varepsilon$

H₂: IS has a significant intervening effect on the relationship between governance and financial performance of pension plans.

The results in Table 4 below regarding the second step of the mediation analysis reveal a very high predictive power of the model, with an R^2 of .911. This indicates that 91.1% of the variation in the IS index could be explained by the CG indicators.

Table 4. Model 1 summary of the R^2 of the predictor variables corporate governance (CG) indicators and the dependent variable investment strategy (IS) index

R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R^2 Change	F Change	df_1	df_2	Sig. F Change	
.955 ^a	.911	.899	5.57871	.911	72.006	7	49	<.001	1.441

Note: a. Predictors: (Constant), stakeholders' interests in board decisions, board structure and composition, commitment to CG, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities.

The results of ANOVA in Table 5 show that the overall model was statistically significant $F(7, 49) = 71.819, p < .001$, meaning the combination of governance predictors effectively predicts the mediator (IS index). The findings implied that in Kenya, pension funds that applied good governance could reduce agency problems, in which managers might act in their own interests rather than members' interests, to align decisions with fund objectives in the long term. Governance will shape the quality of investment decisions by ensuring that investment decisions are not only technically sound but also ethically grounded, transparent, and aligned with the long-term interests of beneficiaries. Thus, effective governance will improve the strategic investment process, risk management, and ultimately the financial performance and sustainability of pension funds in the country.

Table 5. ANOVA^a of the relationship between corporate governance (CG) indicators and the index (Model 1)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	13.921	7	.560	71.819	<.001 ^b
Residual	.382	49	.008		
Total	4.304	56			

Note: a. Dependent variable: IS index; b. Predictors: (Constant), stakeholders' interests in board decisions, board structure and composition, commitment to CG, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities.

Table 6. Coefficients of investment strategy (IS) index and corporate governance (CG) indicators (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-Order	Partial	Part	Tolerance	VIF
(Constant)	-.181	.046		3.906	<.001					
Board structure and composition	.712	.142	.629	5.032	<.001	.944	.584	.214	.116	8.621
Board responsibilities	.200	.111	.182	1.802	.078	.884	.249	.077	.178	5.631
Shareholder's rights	.032	.052	.029	.614	.542	.082	.087	.026	.792	1.263
Disclosure and transparency	.121	.088	.111	1.382	.173	.810	.194	.059	.283	3.538
Commitment to CG	-.034	.031	-.047	1.092	.280	-.007	-.154	-.046	.959	1.043
Role of stakeholders	.142	.066	.115	2.143	.037	.559	.293	.091	.632	1.582
Stakeholders' interests in board decisions	-.017	.041	-.018	-.410	.683	-.014	-.059	-.017	.945	1.058

Note: VIF = Variance Inflation Factor

On individual predictor performance, Table 6 shows that only two of the seven CG indicators significantly influenced the IS, namely i) Board structure and composition showed a significantly positive effect ($t = 5.032, p < .001$); and ii) Role of stakeholders showed a significantly positive effect ($t = 2.143, p < .05$). The other CG indicators had no significant effect and thus failed the criteria for mediation. There were positive but non-significant indicators: Board responsibilities ($p = .078$), Shareholder's rights ($p = .542$), Disclosure & transparency ($p = .173$); and there were also negative and non-significant ones: commitment to CG ($p = .28$) and stakeholders' interests in board decisions ($p = .683$).

Based on the estimated coefficients, the predictive regression model is specified as follows:

$$\text{IS Index} = -.181 + .712(\text{BS\&C}) + .200(\text{BR}) + .032(\text{SR}) + .121(\text{D\&T}) - .034(\text{CCG}) + .142(\text{RS}) - .017(\text{SIBD}) \quad (11)$$

Although the results of ANOVA in Table 6 confirmed that CG indicators collectively had a significant relationship with the IS Index, the absence of statistically significant effects in respect of board responsibilities, shareholders' rights, disclosure and transparency, commitment to CG, and stakeholders' interests in board decisions implied that these variables failed to satisfy the mediation criteria. Consequently, these variables did not exhibit a mediating influence on the relationship between CG and the combined ROI of pension funds. Nonetheless, mediation analysis proceeded to step 3, on the basis of the significant effects of board structure and composition as well as the role of stakeholders on IS Index.

4.1.3 Step 3: Testing the relationship between the combined return on investment of pension funds and investment strategy index

Step 3: $Y = a_0 + \beta_2 Me + \varepsilon$

The third step involved expressing the combined ROI of pension funds as a function of the intervening factor, the IS index. The results presented in Table 7 indicate that the R^2 for the overall model was .184, with an adjusted R^2 of .169. According to Hagerty & Srinivasan (1991), this represented a weak effect size. The author averred that R^2 values below .3 indicated a weak effect, whereas those between .3 and .5 indicated a moderate effect, while those above .7 indicated a strong effect on the dependent variable. This meant that the IS index based on the regression model explained 18.4% of the variation in the combined ROI of pension funds, representing a linear combination of the IS index.

Table 7. Model 1 summary of the R^2 of the predictor variable investment strategy (IS) index and the dependent variable combined return on investment (ROI) of pension funds

<i>R</i>	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				Durbin-Watson	
				R^2 Change	<i>F</i> Change	<i>df</i> 1	<i>df</i> 2		Sig. <i>F</i> Change
.429 ^a	.184	.169	46.59898	.184	12.386	1	55	<.001	2.160

Note: a. Predictors: (Constant), IS index.

The *F*-statistic, which tested the overall significance of the regression model, showed that the model was statistically significant, as evidenced by the *F*-statistic of 12.386 ($df = 1, 55$) and a *p*-value of $< .001$. The model therefore significantly predicted the combined ROI of pension funds (Table 8). The results revealed that IS played a central role in determining the return performance of pension funds in Kenya by shaping asset allocation, risk exposure, and diversification outcomes. This is in line with MPT, which postulates that pension funds adopting diversified asset allocation strategies and alternative assets are better positioned to optimize risk-adjusted returns.

Table 8. ANOVA^a of the relationship between the combined return on investment (ROI) of pension funds and investment strategy (IS) index (Model 1)

Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Regression	26,896.217	1	26,896.217	12.386	<.001 ^b
Residual	119,430.574	55	2171.465		
Total	146,326.791	56			

Note: a. Dependent variable: Combined ROI of pension funds; b. Predictors: (Constant), IS index.

The regression coefficients in Table 9 indicate that the IS index had a statistically significant effect on the combined ROI of pension funds ($t = 3.526, p < .001$). Thus, the study showed that the IS index was a significant predictor of the dependent variable. The predictor model, taking into account the significance levels, was specified as: Combined ROI of pension funds = $-7.084 + 79.179$ IS index. The Baron & Kenny (1986) causal steps approach, having established significant relationships from Step 1 through 3, could meet the criteria for mediation. The study

then proceeded to Step four to determine the types of mediation that have occurred.

Table 9. Coefficients of the combined return on investment (ROI) of pension funds and investment strategy (IS) index, the predictor impact (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Correlations		
	<i>B</i>	Std. Error	Beta			Zero-Order	Partial	Part
(Constant)	-7.084	12.842		-.553	.583			
IS index	79.179	22.455	.429	3.526	<.001	.429	.429	.429

4.1.4 Step 4: Testing the relationship between the combined investment strategy of pension funds, corporate governance indicators, and investment strategy index

$$\text{Step 4: } Y = \alpha_0 + \beta_2 Me + \beta_1 X_1 + \varepsilon$$

Table 10. Model 1 summary of the R^2 of the predictor variables investment strategy (IS) index and corporate governance (CG) indicators and the dependent variable combined return on investment (ROI) of pension funds

<i>R</i>	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
				R^2 Change	<i>F</i> Change	<i>df</i> 1	<i>df</i> 2	Sig. <i>F</i> change
.637 ^a	.405	.306	42.582	.405	4.087	8	48	<.001

Note: a. Predictors: (Constant), IS index, commitment to CG, stakeholders' interests in board decisions, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities, board structure and composition.

In this final step, regression of the dependent variable (*Y*) was tested on both the independent variable (*X*) and the mediator (*M*) simultaneously. Observation was done on the significance of the direct effect (the relationship between *X* and *Y* while controlling *M*).

The results in the study indicated that the coefficient of determination (R^2) for the overall model in step four was .405, with an adjusted R^2 of .306, signifying a moderate effect size of the model as per Hagerty & Srinivasan (1991) criteria, in which values below .3 indicated a weak effect. Values between .3 and .5 indicated a moderate effect, and values above .7 indicated a strong effect (Table 10). This implied that 30.6% of the variation in the combined ROI of pension funds was explained by the regression model, which was a linear combination of CG indicators and IS index.

Table 11. ANOVA^a of the relationship between combined return on investment (ROI) of pension funds, corporate governance (CG) indicators, and investment strategy (IS) index (Model 1)

Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Regression	59,291.006	8	7,411.376	4.087	<.001 ^b
Residual	87,035.785	48	1,813.246		
Total	146,326.791	56			

Note: a. Predictors: (Constant), IS index, commitment to CG, stakeholders' interests in board decisions, shareholder's rights, role of stakeholders, disclosure and transparency, board responsibilities, board structure and composition. b. Dependent variable: Combined ROI of pension funds.

The ANOVA results (Table 11) show that the overall regression model was statistically significant ($F(8, 48) = 4.087, p = .001$), meaning the predictors collectively had a significant impact on the dependent variable. Consequently, the model significantly predicted the combined ROI of pension funds. The results implied that pension funds in Kenya with good CG standards and investment strategies were likely to achieve better funding levels and long-term sustainability. IS plays a central role in determining the return performance of pension funds by shaping asset allocation, risk exposure, and diversification outcomes as postulated by MPT. The effectiveness of investment strategies, however, depends on governance structures that align trustees' decisions with beneficiaries' interests, to be in line with Agency Theory.

Table 12 presents the regression coefficients of the model to indicate the impact of individual predictors. The findings revealed that only the Role of stakeholders demonstrated a significantly positive effect on the combined ROI ($t = 2.330, p < .05$). However, all the other CG indicators and the IS index were found to be non-significant predictors of combined ROI in this model. The predictor model, when taking into account the significance levels, is specified below:

$$\text{Combined ROI of pension funds} = -12.490 - 37.750 \text{ BS\&C} - 91.704 \text{ BR} - 19.205 \text{ SR} + 30.918 \text{ D\&T} - 5.311 \text{ CCG} + 77.630 \text{ RS} + 27.301 \text{ SIBD} + 128.119 \text{ IS} \quad (12)$$

Table 12. Coefficients of combined return on investment (ROI) of pension funds, corporate governance (CG) indicators, and investment strategy (IS) index, the predictor impact (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Correlations		
	<i>B</i>	Std. Error	Beta			Zero-Order	Partial	Part
(Constant)	-12.490	25.593		-.488	.628			
Board structure and composition	-37.750	84.064	-.181	-.449	.655	.366	-.065	-.050
Board responsibilities	-91.704	55.311	-.452	-1.658	.104	.245	-.233	-.185
Shareholder's rights	-19.205	25.338	-.095	-.758	.452	-.170	-.109	-.084
Commitment to CG	-5.311	14.996	-.041	-.354	.725	-.133	-.051	-.039
Role of stakeholders	77.630	33.312	.341	2.330	.024	.539	.319	.259
Stakeholders' interests in board decisions	27.301	19.652	.159	1.389	.171	.200	.197	.155
IS index	128.119	68.878	.695	1.860	.069	.429	.259	.207

Note: a. Dependent variable: combined ROI of pension funds

4.1.5 Stepwise analysis of the moderating effect of macroeconomic variables on the relationship between corporate governance indicators and the combined return on investment of pension funds

Table 13. Model summary and R^2 for the combined return on investment (ROI) of pension funds

Model	<i>R</i>	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				Durbin-Watson	
					R^2 Change	<i>F</i> Change	<i>df</i> 1	<i>df</i> 2		Sig. <i>F</i> Change
1	.539 ^a	.290	.277	43.45326	.290	22.496	1	55	<.001	
2	.603 ^b	.363	.340	41.53071	.073	6.210	1	54	.016	
3	.662 ^c	.438	.407	39.37951	.075	7.061	1	53	.010	
4	.713 ^d	.509	.471	37.18350	.070	7.445	1	52	.009	1.964

Note: a. Predictors: (Constant), Role of stakeholders. b. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index. c. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index, inflation (%). d. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index, inflation (%), GDP growth rate (%). e. Dependent variable: Combined ROI of pension funds.

Table 14. ANOVA^a of the moderating effect of macroeconomic variables on the relationship between CG indicators and the combined ROI of pension funds

Model	Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
1	Regression	42,476.570	1	42,476.570	22.496	<.001 ^b
	Residual	103,850.221	55	1,888.186		
	Total	146,326.791	56			
2	Regression	53,187.612	2	26,593.806	15.418	<.001 ^c
	Residual	93,139.180	54	1,724.800		
	Total	146,326.791	56			
3	Regression	64,137.277	3	21,379.092	13.786	<.001 ^d
	Residual	82,189.514	53	1,550.746		
	Total	146,326.791	56			
4	Regression	74,430.932	4	18,607.733	13.458	<.001 ^e
	Residual	71,895.860	52	1,382.613		
	Total	146,326.791	56			

Note: a. Dependent variable: Combined ROI of pension funds. b. Predictors: (Constant), Role of stakeholders. c. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index. d. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index, inflation (%). e. Predictors: (Constant), Role of stakeholders, NSE 20 Share Index, inflation (%), GDP growth rate (%)

The R^2 Change in Table 13 indicates the addition of interaction terms significantly improved the models. The interaction variables accounted for an additional 7.3% of the variation in model 2, 7.5% in model 3, and 7% in model 4. Specifically, the additional variance was attributable to the inclusion of the interaction terms involving the NSE 20 Share Index in Model 2; the NSE 20 Share Index and Inflation Rate in Model 3; and the NSE 20 Share Index, inflation rate, and GDP growth rate in Model 4. The increases in R^2 were statistically significant across all

three models, as the values of Sig. *F* Change were all below the threshold of $p < .05$. These results suggested that the macroeconomic variables NSE 20 Share Index, inflation rate, and GDP growth rate significantly moderated the relationship between CG indicators and the combined ROI of pension funds.

As seen in the ANOVA in Table 14, *F*-statistic, which tested the overall significance of each regression model, showed that all four models were statistically significant at $\alpha = .01$, level ($p < .001$) thus confirming their utility in predicting the combined ROI of pension funds. Specifically, the results showed that Model 1 was statistically significant with $F(1,55) = 22.496, p < .001$; Model 2 with $F(2,54) = 15.418, p < .001$; Model 3 with $F(3,53) = 13.786, p < .001$; and Model 4 with $F(4,52) = 13.458, p < .001$. These findings confirmed that the inclusion of additional predictors across the models significantly improved the explanatory power of the regression in predicting the combined ROI of pension funds.

Predictive Equations for the models

- i) Model 1: $ROI = -12.250 + 122.579 (RS)$
- ii) Model 2: $ROI = -131.407 + 119.485 (RS) + .034 (NSE20)$
- iii) Model 3: $ROI = -1.200 + 106.432 (RS) + .049 (NSE20) - 27.886 (Inf)$
- iv) Model 4: $ROI = 38.714 + 109.841 (RS) + .068 (NSE20) - 29.974(Inf) - 23.366 (GDP)$

4.1.6 Regression analysis of the moderating effect of macroeconomic variables on the relationship between corporate governance indicators and the combined return on investment of pension funds

The results presented in Table 15 show that the overall model achieved an R^2 of .784 with an adjusted R^2 of .705, indicating a strong effect size (Hagerty & Srinivasan, 1991). This implied that 78.4% of the variation in the combined ROI of pension funds was explained by the regression model, which represented a linear combination of the predictor variables, CG indicators, and macroeconomic variables. The study concluded that including all CG indicators and macroeconomic variables simultaneously explained significantly more variation than the stepwise approach, thus increasing the explanatory power from 51% in Model 4 to 78.4% in Model 5.

Table 15. Model 1 summary of the R^2 of corporate governance (CG) indicators, Macroeconomic factors and combined return on investment (ROI) of pension funds

<i>R</i>	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R^2 Change	<i>F</i> Change	<i>df</i> 1	<i>df</i> 2	Sig. <i>F</i> Change	
.885 ^a	.784	.705	27.77042	.784	9.916	15	41	<.001	1.457

Note: a. Predictors: (constant), Unemployment rate, shareholder's rights, board structure and composition, commitment to CG, stakeholders' interests in board decisions, GDP growth rate (%), role of stakeholders, balance of payments, inflation (%), exchange rate (KS/US\$), disclosure and transparency, commercial banks weighted average lending interest rates (%), board responsibilities, CBK 91-Day T Bill, NSE 20 Share Index.

F-statistic, which tested the significance of the overall regression model, indicated that at $\alpha = .01$, the regression was statistically significant as the *p*-value was less than .001. Accordingly, the model significantly predicted the combined ROI of pension funds, with $F(15,41) = 9.916, p < .001$, as shown in the ANOVA results in Table 16.

Table 16. ANOVA^a of the relationship between combined return on investment (ROI) of pension funds, corporate governance (CG) indicators, and macroeconomic variables (Model 1)

Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
Regression	114,707.750	15	7647.183	9.916	<.001 ^b
Residual	31,619.041	41	771.196		
Total	146,326.791	56			

Note: a. Dependent variable: Combined ROI of pension funds. b. Predictors: (Constant), Unemployment rate, shareholder's rights, board structure and composition, commitment to CG, stakeholders' interests in board decisions, GDP growth rate (%), role of stakeholders, balance of payments, inflation (%), exchange rate (KS/US\$), disclosure and transparency, commercial banks weighted average lending interest rates (%), board responsibilities, CBK 91-Day T Bill, NSE 20 Share Index.

The coefficients presented in Table 17 indicate that there were significantly positive and negative drivers of pension performance. Among the CG indicators, only the Role of stakeholders had a statistically significant positive effect on the combined ROI of pension funds ($t = 2.277, p < .05$). This suggested that stronger stakeholder engagement contributed positively to pension fund performance.

Several macroeconomic variables, however, exhibited negative but statistically significant effects on the combined ROI of pension funds. These included the inflation rate ($t = -6.79, p < .001$), exchange rate ($t = -6.079, p < .001$), Balance of payments ($t = -5.956, p < .001$), and NSE 20 Share Index ($t = -5.713, p < .001$). The negative coefficients implied that adverse macroeconomic conditions undermined the performance of pension fund

investment.

Table 17. Coefficients of predictor impact (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Collinearity Statistics	
	<i>B</i>	Std. Error	Beta			Tolerance	VIF
Constant	3765.447	1340.057		2.810	.008		
Board structure and composition	65.836	45.846	.315	1.436	.159	.109	9.144
Board responsibilities	-59.126	36.245	-.292	-1.631	.110	.165	6.062
Shareholder's rights	-16.420	16.824	-.081	-.976	.335	.758	1.319
Disclosure and transparency	5.267	29.363	.026	.179	.859	.248	4.027
Commitment to CG	2.280	10.412	.017	.219	.828	.826	1.211
Role of stakeholders	50.620	22.231	.222	2.277	.028	.552	1.812
Stakeholders' interests in board decisions	11.292	13.372	.066	.844	.403	.865	1.156
GDP growth rate (%)	39.113	20.035	.508	1.952	.058	.078	12.840
Inflation (%)	-298.125	43.908	-3.253	-6.790	<.001	.023	43.558
Exchange rate (KS/US\$)	-142.011	23.363	-8.710	-6.079	<.001	.003	389.578
Commercial banks weighted average lending interest rates	248.618	42.849	4.680	5.802	<.001	.008	123.432
CBK 91-Day T Bill	1477.433	298.888	8.259	4.943	<.001	.002	529.691
Balance of payments,	-8066.328	1354.306	-4.534	-5.956	<.001	.009	109.930
NSE 20 Share Index	-2.087	.365	-16.670	-5.713	<.001	.001	1615.517
Unemployment rate	-73.318	78.120	-.604	-.939	.353	.013	78.659

Note: VIF = Variance Inflation Factor

The other macroeconomic factors, particularly interest rates, exhibited statistically significant positive effects on the combined ROI of pension funds. Commercial banks weighted average lending interest rates ($t = 5.802$, $p < .001$) and CBK 91-day Treasury Bill ($t = 4.943$, $p < .001$) demonstrated positive and statistically significant effects on the combined ROI of pension funds, thus indicating that higher interest-bearing instruments enhanced pension fund returns. Considering only statistically significant predictors, the moderating model incorporating macroeconomic factors is specified as follows:

Model: Moderating Effect of Macroeconomic Factors

$$\text{Combined ROI of Pension Funds} = 3765.447 + 65.836 \text{ BS\&R} - 59.126 \text{ BR} - 16.420 \text{ SR} + 5.267 \text{ D\&T} + 2.280 \text{ CCG} + 50.620 \text{ RS} + 11.292 \text{ SIBD} + 39.113 \text{ GDP} - 298.125 \text{ IR} - 142.011 \text{ ER} + 248.618 \text{ CBWALI} + 1477.433 \text{ CBK91-Day T-Bill} - 8066.328 \text{ BP} - 2.087 \text{ NSE20} - 73.318 \text{ UR} \quad (13)$$

Table 18. Model 1 summary^b of the joint effect of corporate governance (CG) indicators, investment strategy (IS) index, and macroeconomic variables on the combined return on investment (ROI) of pension funds

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. Error of the Estimate	Change Statistics				Durbin-Watson	
				<i>R</i> ² Change	<i>F</i> Change	<i>df</i> ₁	<i>df</i> ₂		Sig. <i>F</i> Change
.907 ^a	.822	.751	25.49247	.822	11.573	16	40	<.001	1.438

Note: a. Predictors: (Constant), Unemployment rate, shareholder's rights, board structure and composition, commitment to CG, stakeholders' interests in board decisions, GDP growth rate (%), role of stakeholders, balance of payments, inflation (%), exchange rate (KS/US\$), disclosure and transparency, commercial banks weighted average lending interest rates (%), board responsibilities, IS index, CBK 91-Day T Bill, NSE 20 Share Index; b. Dependent variable: Combined ROI of pension funds.

4.1.7 The joint effect of cg indicators, macroeconomic variables, and investment strategy index on the combined return on investment of pension funds

H₄: The joint effect of CG, macroeconomic variables as well as IS index is statistically significant on the combined ROI of pension funds registered by the RBA.

The results indicated that the overall regression model achieved an R^2 of .822 and an adjusted R^2 of .751, signifying a strong model fit (Table 18). This implied that 82.2% of the variation in the combined ROI of pension funds was explained by the regression model, which was a linear combination of CG indicators and macroeconomic variables.

Table 19. ANOVA^a of the joint effect of corporate governance (CG) indicators, investment strategy (IS) index, and macroeconomic variables on the combined return on investment (ROI) of pension funds (Model 1)

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	120332.160	16	7520.760	11.573	<.001 ^b
Residual	25994.631	40	649.866		
Total	146326.791	56			

Note: a. Dependent variable: Combined ROI of pension funds. b. Predictors: (Constant), Unemployment rate, shareholder's rights, board structure and composition, commitment to CG, stakeholders' interests in board decisions, GDP growth rate (%), role of stakeholders, balance of payments, inflation (%), exchange rate (KS/US\$), disclosure and transparency, commercial banks weighted average lending interest rates (%), board responsibilities, IS index, CBK 91-Day T Bill, NSE 20 Share Index.

Table 20. Coefficients of the joint effect of corporate governance (CG) indicators, investment strategy (IS) index, and macroeconomic variables on the combined return on investment (ROI) of pension funds (Model 1)

Predictor Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-Order	Partial	Part	Tolerance	VIF
(Constant)	3516.697	1233.038		2.852	.007					
Board structure and composition	-20.829	51.371	-.100	-.405	.687	.366	-.064	-.027	.073	13.624
Board responsibilities	-86.814	34.577	-.428	2.511	.016	.245	-.369	-.167	.153	6.547
Shareholder's rights	-22.141	15.566	-.110	1.422	.163	-.170	-.219	-.095	.746	1.340
Disclosure and transparency	-8.190	27.340	-.041	-.300	.766	.302	-.047	-.020	.241	4.143
Commitment to CG	8.100	9.760	.062	.830	.412	-.133	.130	.055	.792	1.262
Role of stakeholders	33.588	21.213	.148	1.583	.121	.539	.243	.106	.511	1.957
Stakeholders' interests in board decisions	12.120	12.278	.071	.987	.330	.200	.154	.066	.865	1.156
IS index	127.791	43.438	.693	2.942	.005	.429	.422	.196	.080	12.495
GDP growth rate (%)	37.243	18.402	.484	2.024	.050	-.038	.305	.135	.078	12.855
Inflation (%)	-287.343	40.473	-3.136	7.100	<.001	-.227	-.747	-.473	.023	43.918
Exchange rate (KS/US\$)	-135.784	21.551	-8.328	6.301	<.001	-.272	-.706	-.420	.003	393.373
Commercial banks weighted average lending interest rates	239.778	39.449	4.513	6.078	<.001	.155	.693	.405	.008	124.152
CBK 91-Day T Bill	1428.483	274.875	7.985	5.197	<.001	.258	.635	.346	.002	531.639
Balance of payments	7594.110	1253.534	-4.268	6.058	<.001	.110	-.692	-.404	.009	111.763
NSE 20 Share Index	-2.001	.337	-15.988	5.947	<.001	.297	-.685	-.396	.001	1627.602
Unemployment rate	-58.870	71.880	-.485	-8.819	.418	-.159	-.128	-.055	.013	79.028

Note: VIF = Variance Inflation Factor

The ANOVA results presented in Table 19 show that the model was statistically significant at the 1% level. The F -statistic for the overall regression was $F(16,40) = 11.573$ with a p -value $< .001$ and this confirmed that the model was jointly significant and had strong explanatory power in predicting the combined ROI of RBA-registered pension funds. The results revealed that the funding of pensions in Kenya was shaped by an interaction of internal

governance mechanisms, investment strategies, and external macroeconomic conditions. CG mitigated agency problems among trustees, fund managers, and beneficiaries by strengthening oversight, accountability, and transparency, thereby improving funding discipline. Sound governance enabled pension funds to adopt prudent and diversified investment strategies aligned with long-term liabilities, to be consistent with MPT. This could provide the basis for diversified and risk-efficient investment strategies to enhance long-term funding sustainability. IS served as a key transmission mechanism through which governance affected the levels of funding and sustainability. Macroeconomic factors, on the other hand, directly influenced asset returns and the valuation of pension liabilities, often amplifying funding risks. This is in line with APT that explains how macroeconomic factors systematically influence asset returns and funding outcomes.

The coefficients in Table 20 reveal that several variables exerted statistically significant effects on pension fund performance. Among the CG indicators, only Board responsibilities exhibited a negative and statistically significant effect on combined ROI ($t = -2.511, p < .05$). Regarding macroeconomic and market variables, the Exchange rate (KSh/US\$) ($t = -6.301, p < .001$), Balance of payments ($t = -6.058, p < .001$), Inflation ($t = -7.100, p < .001$) and NSE 20 Share Index ($t = -5.947, p < .001$) also showed negative and statistically significant effects on pension fund returns.

In contrast, the IS index had a positive and statistically significant effect on combined ROI ($t = 2.942, p < .05$), underscoring the importance of sound investment decision making. Similarly, GDP growth rate ($t = 2.024, p < .05$), commercial banks weighted average lending interest rates ($t = 6.078, p < .001$), and CBK 91-Day Treasury Bill ($t = 5.197, p < .001$) exerted positive and statistically significant effects on the ROI of pension funds.

Other CG variables, namely board structure and composition ($t = -.405, p = .687$), disclosure and transparency ($t = -1.422, p = .163$), and shareholders' rights ($t = -.300, p = .766$) displayed negative but statistically insignificant effects on pension fund performance. In contrast, commitment to CG ($t = .830, p = .412$), role of stakeholders ($t = 1.583, p = .121$), and stakeholders' interests in board decisions ($t = .987, p = .330$) exhibited positive but statistically insignificant effects.

Based on the estimated coefficients, the joint-effect regression model for combined ROI of pension funds is specified as follows:

The Joint Effect Model

$$\begin{aligned} \text{Combined ROI} = & 3516.697 - 20.829\text{BSC} - 86.814\text{BR} - 22.141\text{SR} - 8.190\&T + 8.100\text{CCG} + \\ & 33.588\text{RS} + 12.120\text{SIBD} + 127.791\text{IS Index} + 37.243\text{GDP} - 287.343 \text{Inflation} - 135.784 \text{EC} + \\ & 239.778\text{CBWALIR} + 1428.483\text{CBK} - 7594.110\text{BP} - 2.001 \text{NSE} - 58.87\text{UR} \end{aligned} \quad (14)$$

5. Discussions

5.1 Relationship between Corporate Governance and the Combined Return on Investment of Pension Funds

This study examined the relationship between CG and the combined ROI of pension funds registered by the RBA. The findings revealed mixed evidence regarding the performance effects of individual CG indicators. Among the variables analyzed, the role of stakeholders was the only governance indicator that exhibited a positive and statistically significant effect on pension fund performance ($t = 2.934, p < .05$). This result suggests that pension funds that actively recognize and integrate stakeholders' interests achieve superior financial outcomes.

The significant influence of stakeholders' governance supports SHT, which posits that organizational performance improves when firms balance the interests of multiple constituencies, including beneficiaries, employees, regulators, and the wider community (Frémond, 2000). This finding also aligns with the G20/OECD Principles of Corporate Governance (OECD, 2015), which emphasize the importance of stakeholders' participation in promoting the creation of sustainable value. From the Agency Theory perspective, stakeholder-oriented governance mechanisms may reduce agency conflicts by aligning managerial actions with the long-term interests of pension beneficiaries, thereby enhancing fund performance.

In contrast, board structure and composition, disclosure and transparency, and stakeholders' interests in board decisions displayed positive but statistically insignificant relationships with the combined ROI. Although these mechanisms were theoretically expected to strengthen oversight and accountability, the results suggested that their effectiveness depended on the quality of implementation rather than formal adoption. Weak enforcement, limited board independence, or compliance-oriented governance practices may reduce their impact on financial performance.

The board of directors is central to CG with responsibility for strategic oversight, risk management, and accountability. However, empirical research has frequently reported inconclusive evidence on the performance effects of board characteristics, particularly in emerging markets. Prior studies have shown that boards may become aligned with management, thereby weakening their monitoring role and limiting their ability to enhance

firm performance via reducing their effectiveness as monitoring mechanisms (Mehran, 1995).

Similarly, disclosure and transparency, despite being fundamental to informed decision making and market discipline, did not exert a significant influence on pension fund returns. This finding suggests that disclosure practices among RBA registered pension funds may not be sufficiently timely, comprehensive, or credible to affect investment outcomes. Weak disclosure regimes have been shown to undermine market confidence and reduce the effectiveness of governance mechanisms (OECD/IOPS, 2011).

The study further found that board responsibilities, shareholders' rights, and commitment to CG were negatively but insignificantly associated with the combined ROI. While these results did not support a direct performance effect, the negative signs might indicate shortcomings in compliance or enforcement of governance frameworks. This outcome highlights the gap between governance principles and their practical application. The findings partially supported existing empirical literature, which documented mixed and sometimes inconclusive relationships between CG mechanisms and firm performance. Such studies with mixed findings included those conducted in Italy (Allegrini & Greco, 2013; Melis, 2000; Zona et al., 2018) and Kenya (Ongore & K'obonyo, 2011).

Overall, the results align with prior empirical evidence which showed that the relationship between CG and pension fund performance was context-dependent. The findings underscored the importance of stakeholder-oriented governance as a key driver of pension fund performance in Kenya, while suggesting that the effectiveness of CG mechanisms depended not only on their design but also on institutional quality, regulatory enforcement, and organizational context. The study suggests that policymakers and regulators should strengthen enforcement of CG standards and promote stakeholders' engagement to enhance the financial sustainability of pension funds in Kenya.

5.2 Relationship between Investment Strategy and the Combined Return on Investment of Pension Funds

The second objective of the study is to establish whether IS mediates the relationship between CG and the combined ROI of RBA registered pension funds. The hypothesis tested was that IS had a significant intervening effect on the governance-performance relationship. IS was measured using an IS index derived from a questionnaire administered to the management of pension funds. Mediation was assessed using path analysis through stepwise regression following the four-step causal approach, and all relations tested in step one to three were found to be significant, thus allowing the analysis to proceed to step four in which the full model was tested.

In step 1, CG indicators were regressed on the combined ROI. The results showed that CG partly explained pension fund performance. Specifically, the role of stakeholders had a positive and statistically significant effect on the combined ROI. Board structure and composition, disclosure and transparency, and stakeholders' interests in board decisions exhibited positive but statistically insignificant effects, implying marginal improvements in returns with enhanced governance practices. In contrast, board responsibilities, shareholders' rights, and commitment to CG showed negative but insignificant effects, suggesting weak or inconsistent implementation of these governance mechanisms. These findings are consistent with the G20/OECD Principles of CG, which emphasize stakeholders' inclusion, accountability, and transparency as foundations for sustainable performance.

The results align with prior empirical evidence. Rais & Goedegebuure (2009) and Ontita & Kinyua (2020) similarly found that effective stakeholders' management enhanced organizational performance. However, the mixed effects of board-related governance variables are consistent with Balagobei (2018), who reported that some board characteristics significantly affected firm performance while others were insignificant or negatively related.

Step 2 examined the effect of CG on the mediating variable. The findings showed that board structure and composition and the role of stakeholders had positive and statistically significant effects on the IS index, while other governance indicators had positive but insignificant effects. This suggests that governance mechanisms influence the formulation and quality of investment strategies. These findings are consistent with Khanna & Zyla (2012), who established that governance played an important role in investment decision making, and with Useem & Mitchell (2000), who argued that governance affected performance indirectly through IS.

In step 3, IS index was regressed on the combined ROI and established that IS index had a positive and statistically significant effect on the combined ROI of pension funds, thus implying that enhanced application of various investment strategies increased returns. This result supports earlier studies by Blake et al. (1999), Coggin et al. (1993), and Grinblatt & Titman (1989), which demonstrated that asset allocation explained a substantial proportion of pension fund return variability, although evidence on market timing remained mixed.

Step 4 assessed the full mediation model by regressing the combined ROI on both CG indicators and IS index. The findings revealed that the combined effect of the CG indicators and the IS index variable accounted for 40.5% of the variation in the combined ROI ($R^2 = .405$, adjusted $R^2 = .306$), indicating a moderate explanatory power. The overall regression model was statistically significant ($F(8,48) = 4.087$, $p < .001$). The role of stakeholders remained positively significant, while IS and other governance indicators showed positive but statistically insignificant effects. These results confirm partial mediation, hence implying that CG affects pension fund performance both directly and indirectly through IS.

The study concluded that the hypothesis of a significant intervening effect of IS was supported. CG influences

financial performance indirectly through its impact on the development and implementation of investment strategies. The results align with those of Balagobei (2018), Fama (1965), and Soumaya (2015) as well as the G20/OECD Principles of CG, in order to highlight the importance of governance in fostering accountability in investment decision-making processes and ultimately improving pension fund performance.

5.3 Relationship among Macroeconomic Variables, Corporate Governance, and the Combined Return on Investment of Pension Funds

The third objective of the study examined whether macroeconomic factors moderated the relationship between CG indicators and the combined ROI of pension funds. Multiple regression and stepwise moderation analyses were conducted using macroeconomic factors as moderating variables.

The stepwise regression results revealed statistically significant moderation effects. The addition of interaction terms significantly increased the explained variation of R^2 Change in models 2, 3, and 4 by 7.3%, 7.5%, and 7%, respectively with ($p < .05$), thus confirming the presence of moderation. Specifically, the NSE 20 Share Index (Model 2), inflation rate (Model 3), and GDP growth rate (Model 4) significantly moderated the relationship between CG indicators and the combined ROI of pension funds. The moderation results were supported by ANOVA findings, which illustrated that all models were statistically significant at $\alpha = .01$. The F -statistics were: Model 1 $F(1,55) = 22.496$; Model 2 $F(2,54) = 15.418$; Model 3 $F(3,53) = 13.786$; and Model 4 $F(4,52) = 13.458$ (all $p < .001$). When all CG indicators and macroeconomic variables were jointly included (Model 5), the model produced an R^2 of .784 and an adjusted R^2 of 0=.705, indicating a strong explanatory power. Thus, 78.4% of the variation in the combined ROI of pension funds was explained by the combined effects of governance and macroeconomic variables, compared to 47.1% under the stepwise specification. The overall regression was statistically significant, $F(15,41) = 9.916, p < .001$.

Coefficient estimates showed that commercial banks weighted average lending interest rates ($t = 5.802, p < .001$) and CBK 91-Day Treasury Bill ($t = 4.943, p < .001$) had positive and statistically significant effects on the combined ROI. In contrast, Inflation rate, Exchange rate, Balance of payments, and the NSE 20 Share Index exerted negative but statistically significant effects ($p < .001$). Among the CG indicators, only the role of stakeholders had a positive and statistically significant effect on the combined ROI ($t = 2.277, p < .05$). The findings align with previous studies regarding the influence of industrial production and fiscal events on stock performance in the developed and emerging economies (Chen, 1991; Roll & Ross, 1980).

Overall, the findings rejected the null hypothesis and confirmed that macroeconomic factors significantly moderated the relationship between CG and pension fund performance. The results are consistent with APT, which links asset returns to systematic macroeconomic risk factors, and align with prior empirical studies. The significance of the role of stakeholders further supports SHT, which emphasizes the importance of inclusive governance mechanisms in enhancing pension fund performance.

5.4 Joint Effect of Corporate Governance, Investment Strategy, Macroeconomic Variables, and the Combined Return on Investment of Pension Funds

The fourth objective of the study examined the joint effect of CG, IS, and macroeconomic variables on the combined ROI of pension funds registered by the RBA as at 31 December 2022. The study hypothesised that the joint effect of these variables on pension fund performance was statistically significant. The results supported this hypothesis, although mixed effects were observed across individual predictors. The regression results demonstrated strong explanatory power of the joint model. The coefficient of determination R^2 was .822, with an adjusted R^2 of .751, indicating that 82.2% of the variation in the combined ROI of pension funds was explained by the combined influence of CG indicators, IS, and macroeconomic variables. The overall model was statistically significant at the 1% level ($F(16, 40) = 11.573, p < .001$), confirming that the joint model was appropriate for predicting pension fund performance.

At the level of individual variables, mixed results were observed for CG indicators. Board responsibilities exhibited a negative but statistically significant effect on the combined ROI ($t = -2.511, p < .05$), suggesting that weak implementation of board oversight, strategic guidance, and accountability mechanisms significantly reduced pension fund performance. Other governance indicators, such as board structure and composition, shareholders' rights, and disclosure and transparency, had negative but statistically insignificant effects, thus implying that failing to adopt these governance measures leads to a decline in returns that is not statistically meaningful. In contrast, commitment to CG, role of stakeholders, and stakeholders' interests in board decisions revealed positive but statistically insignificant effects, indicating potential performance benefits that may not be immediately observable in financial returns.

The findings on CG are consistent with Agency Theory, which posits that governance mechanisms are essential in reducing conflicts of interest between managers and stakeholders and in aligning managerial decisions with long-term performance objectives. They are also aligned with the G20/OECD Principles of CG (OECD, 2020),

which emphasize effective board oversight, accountability, transparency, and stakeholder engagement as foundations for sustainable organizational performance. Equally, Alduais et al. (2022) affirmed that CG was an important and effective technique for enhancing investors' confidence in existing and prospective companies and for creating opportunities for safe investment.

IS emerged as a key driver of pension fund performance. The IS index had a positive and statistically significant effect on the combined ROI ($t = 2.942, p < .05$), underscoring the importance of asset allocation and decisions of portfolio diversification. This result supports MPT (Markowitz, 1952), which argued that investors could maximize expected returns for a given level of risk through diversification. The finding is also consistent with empirical evidence that strategic asset allocation explained a substantial proportion of variation in pension fund returns, even though prior studies reported mixed evidence on market timing and active management (Core et al., 1999; Pettinger, 2025).

The effects of macroeconomic variables on pension fund performance were also mixed. GDP growth rate, commercial banks weighted average lending interest rates, and CBK 91-Day Treasury Bill exerted positive and statistically significant effects on the combined ROI, hence suggesting that favorable economic growth and stable interest rate environments enhanced pension fund returns. In contrast, inflation, exchange rate movements (KES/US\$), balance of payments, and the NSE 20 share index had negative and statistically significant effects, indicating that macroeconomic instability and adverse conditions of capital market undermined pension fund performance. The unemployment rate had a negative but statistically insignificant effect.

These results are consistent with APT of Ross (2013), which posited that asset returns were influenced by multiple systematic risk factors. Prior empirical studies similarly demonstrated that macroeconomic variables such as GDP growth, inflation, interest rates, and exchange rates significantly affected investment returns. Evidence from both international and Kenyan studies further supported the link between stock market performance and broader economic conditions. Similarly, the results in this study are in agreement with those by Chen et al. (1986) and Roll & Ross (1980), which established that factors such as GDP, changes in inflation, and interest rates affected expected stock returns. Similarly, researchers including Clare & Thomas (1994), Mookerjee & Yu (1997), Kwon & Shin (1999), Humpe & Macmillan (2009), Bodie et al. (1988), and Pilinkus (2010) found that factors such as real GDP, industrial production, lagged inflation and interest rate had a positive impact on stock performance.

Overall, the findings established the statistically significant joint effect of CG, IS, and macroeconomic variables on the financial performance of pension funds in Kenya. While IS and macroeconomic conditions exerted a stronger and more direct influence on the combined ROI, specific governance dimensions, particularly board responsibilities, remained critical in safeguarding pension fund performance. The results underscored the importance of strengthening governance frameworks, adopting sound investment strategies, and managing macroeconomic risks to enhance the long-term sustainability and returns of pension funds.

6. Conclusions

Measured by the combined ROI, this study examined the effects of CG, IS, and macroeconomic conditions on the financial performance of pension funds registered by the RBA in Kenya. CG was operationalized through board structure and composition, board responsibilities, shareholders' rights, disclosure and transparency, commitment to governance, and stakeholders' roles in board decision making. IS was tested as a mediating variable, while selected macroeconomic variables were examined as moderators.

The results confirmed a significant relationship between CG and pension fund performance, leading to rejection of the null hypothesis. Among governance dimensions, only the role of stakeholders exerted a positive and statistically significant effect on performance, thus providing strong support for SHT. Other governance indicators like board structure and composition, disclosure and transparency, and stakeholders' interests in board decisions showed positive but insignificant effects, to be consistent with Agency Theory. Board responsibilities, shareholders' rights, and commitment to CG exhibited negative but insignificant effects, suggesting weak enforcement rather than governance inefficacy.

IS significantly mediated the CG–performance relationship, thus confirming it as the main transmission channel through which governance affected returns and aligning with MPT. Inflation, GDP growth, and the NSE 20 Share Index significantly moderated the CG–performance relationship, to be consistent with asset pricing and macroeconomic theories. Overall, the findings support Agency Theory, SHT, MPT, and APT, emphasizing an integrated governance–investment–macroeconomic framework for enhancing pension fund performance.

6.1 Implications of the Findings: Contributions to Theory and Knowledge

This study contributes to the literature on pension finance, CG, investment, and macroeconomic conditions by providing integrated evidence in a developing country context. First, it confirmed and extended the applicability of Agency Theory, SHT, MPT, and APT to pension fund performance in emerging countries. In addition, it demonstrated that these theories were complementary when governance quality, investment behavior, and

macroeconomic conditions were jointly examined.

Second, the study offered novel empirical evidence that CG, IS, and macroeconomic variables jointly and significantly influenced the ROI of pension funds. Stakeholders' involvement emerged as a key governance mechanism with a positive and significant effect on performance, while other governance indicators showed mixed results, suggesting that partial implementation limited effectiveness. Third, the findings revealed that IS mediated the governance–performance relationship, to be consistent with MPT, and that macroeconomic variables, in line with APT, significantly moderated this relationship. These results enhanced the understanding of the roles of determinants in pension fund performance in developing markets.

On policy and practical implications, the study provides evidence relevant for pension fund managers, regulators (the RBA), and policymakers in emerging markets to inform governance reforms, investment decision making, and regulatory policies to improve sustainability and performance of pension funds.

Author Contributions

Conceptualization, W.A.; formal analysis, W.A.; investigation, W.A.; resources, W.A.; data curation, W.A.; writing—original draft preparation, W.A.; writing—review and editing, W.A. and D.O.; supervision, J.L. and M.O. All authors have read and agreed to the published version of the manuscript.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflict of interest.

References

- Aguilera, R. V., Filatotchev, I., Gospel, H., & Jackson, G. (2008). An organizational approach to comparative corporate governance: Costs, contingencies, and complementarities. *Organ. Sci.*, *19*(3), 475–492. <https://doi.org/10.1287/orsc.1070.0322>.
- Alduais, F., Almasria, N. A., & Airout, R. (2022). The moderating effect of corporate governance on corporate social responsibility and information asymmetry: An empirical study of Chinese listed companies. *Economies*, *10*(11), 280. <https://doi.org/10.3390/economies10110280>.
- Allegrini, M. & Greco, G. (2013). Corporate boards, audit committees and voluntary disclosure: Evidence from Italian listed companies. *J. Manag. Gov.*, *17*(1), 187–216. <https://doi.org/10.1007/s10997-011-9168-3>.
- Ambachtsheer, K., Capelle, R., & Lum, H. (2006). Pension fund governance today: Strengths, weaknesses, and opportunities for improvement. *Financ. Anal. J.*, *20*, 383–403.
- Ambachtsheer, K., Capelle, R., & Scheibelhut, T. (1998). Improving pension fund performance. *Financ. Anal. J.*, *54*(6), 15–21. <https://doi.org/10.2469/faj.v54.n6.2221>.
- Ambachtsheer, K. P. (2001). *A framework for public pension fund management*. World Bank Public Pension Fund Management Conference. www.worldbank.org/finance
- Ammann, M. & Ehmann, C. (2017). Is governance related to investment performance and asset allocation? Empirical evidence from Swiss pension funds. *Swiss J. Econ. Stat.*, *153*(3), 293–339. <https://doi.org/10.1007/BF03399510>.
- Antolin, P. (2008). Pension fund performance. *OECD Working Papers on Insurance and Private Pensions*, *20*. <https://doi.org/10.1787/240401404057>.
- Balagobei, S. (2018). Corporate governance and firm performance: Empirical evidence from emerging market. *Asian Econ. Financ. Rev.*, *8*(12), 1415–1421. <https://doi.org/10.18488/journal.aefr.2018.812.1415.1421>.
- Baron, R. M. & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.*, *51*(6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>.
- Besley, T. J. & Prat, A. (2005). *Pension fund governance and the choice between defined benefit and defined contribution plans*. SSRN. <https://ssrn.com/abstract=436991>
- Bilau, B. (2010). *Portfolio Management for Institutional Investors*. CFA Romania.
- Black, A., Fraser, P., & MacDonald, R. (1997). Business conditions and speculative assets. *Manch. Sch.* *65*(4), 379–393. <https://doi.org/10.1111/1467-9957.00070>.
- Blair, M. M. (1995). Rethinking assumptions behind corporate governance. *Challenge*, *38*(6), 12–17. <https://doi.org/10.1080/05775132.1995.11471861>.
- Blake, D., Lehmann, B. N., & Timmermann, A. (1999). Asset allocation dynamics and pension fund performance.

- J. Bus.*, 72(4), 429–461. <https://doi.org/10.1086/209623>.
- Bodie, Z., Marcus, A. J., & Merton, R. C. (1988). Defined benefit versus defined contribution pension plans: What are the real trade-offs? In *Pensions in the US Economy* (pp. 139–162). University of Chicago Press.
- Campbell, D. T. & Stanley, J. C. (2015). *Experimental and Quasi-Experimental Designs for Research*. Ravenio Books.
- Carmichael, J. & Palacios, R. (2003). A framework for public pension fund management. In *Public Pension Fund Management: Governance, Accountability, and Investment Policies* (pp. 1–48). The World Bank.
- Chen, N. F. (1991). Financial investment opportunities and the macroeconomy. *J. Finance*, 46(2), 529–554. <https://doi.org/10.1111/j.1540-6261.1991.tb02673.x>.
- Chen, N. F., Roll, R., & Ross, S. A. (1986). Economic forces and the stock market. *J. Bus.*, 383–403.
- Cheng, A. C. (1996). Economic factors and stock markets: Empirical evidence from the UK and the US. *Int. J. Finance Econ.*, 1(4), 287–302. [https://doi.org/10.1002/\(SICI\)1099-1158\(199610\)1:4%3C287::AID-IJFE26%3E3.0.CO;2-Y](https://doi.org/10.1002/(SICI)1099-1158(199610)1:4%3C287::AID-IJFE26%3E3.0.CO;2-Y).
- Chow, G. C. (2005). The role of planning in China's market economy. *J. Chin. Econ. Bus. Stud.*, 3(3), 193–203. <https://doi.org/10.1080/14765280500317866>.
- Clare, A. D. & Thomas, S. H. (1994). Macroeconomic factors, the APT and the UK stockmarket. *J. Bus. Finance Account.*, 21(3), 309–330. <https://doi.org/10.1111/j.1468-5957.1994.tb00322.x>.
- Clarke, T. (2009). *A critique of the Anglo-American model of corporate governance*. SSRN. <http://doi.org/10.2139/ssrn.1440853>.
- Coggin, T. D., Fabozzi, F. J., & Rahman, S. (1993). The investment performance of US equity pension fund managers: An empirical investigation. *J. Finance*, 48(3), 1039–1065. <https://doi.org/10.1111/j.1540-6261.1993.tb04062.x>.
- Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *J. Financ. Econ.*, 87(2), 329–356. <https://doi.org/10.1016/j.jfineco.2006.08.008>.
- Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *J. Financ. Econ.*, 51(3), 371–406. [https://doi.org/10.1016/S0304-405X\(98\)00058-0](https://doi.org/10.1016/S0304-405X(98)00058-0).
- Creswell, J. W. (2009). Mapping the field of mixed methods research. *J. Mix. Methods Res.*, 3(2), 95–108. <https://doi.org/10.1177/1558689808330883>.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. <https://doi.org/10.1007/BF02310555>.
- Daines, R. & Klausner, M. (2001). Do IPO charters maximize firm value? Antitakeover protection in IPOs. *J. Law Econ. Organ.*, 17(1), 83–120. <https://doi.org/10.1093/jleo/17.1.83>.
- Darko, J., Aribi, Z. A., & Uzonwanne, G. C. (2016). Corporate governance: The impact of director and board structure, ownership structure and corporate control on the performance of listed companies on the Ghana stock exchange. *Corp. Gov.*, 16(2), 259–277. <https://doi.org/10.1108/CG-11-2014-0133>.
- Davis, E. P. & Hu, Y. W. (2008). Are Canadian pension plans disadvantaged by the current structure of portfolio regulation? In *Department of Economics, Finance and Accounting Research Papers*. Brunel University. <http://bura.brunel.ac.uk/handle/2438/3482>
- De Vos, A. S. (1998). *Research at Grass Roots: A Primer for the Caring Professions*. Van Schaik Publishers.
- Donaldson, T. & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Acad. Manag. Rev.*, 20(1), 65–91. <https://doi.org/10.5465/amr.1995.9503271992>.
- Ehikioya, B. I. (2009). Corporate governance structure and firm performance in developing economies: Evidence from Nigeria. *Corp. Gov.*, 9(3), 231–243. <https://doi.org/10.1108/14720700910964307>.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Acad. Manag. Rev.*, 14(1), 57–74. <https://doi.org/10.5465/amr.1989.4279003>.
- Fama, E. F. (1965). The behavior of stock-market prices. *J. Bus.*, 38(1), 34–105.
- Fischer, S. (1993). The role of macroeconomic factors in growth. *J. Monet. Econ.*, 32(3), 485–512. [https://doi.org/10.1016/0304-3932\(93\)90027-D](https://doi.org/10.1016/0304-3932(93)90027-D).
- Flannery, M. J. & Protopapadakis, A. A. (2002). Macroeconomic factors do influence aggregate stock returns. *Rev. Financ. Stud.*, 15(3), 751–782. <https://doi.org/10.1093/rfs/15.3.751>.
- Freeman, R. E. (2010). *Strategic Management: A Stakeholder Approach*. Cambridge University Press.
- Frémond, O. (2000). The role of stakeholders. In *Presentation, First Meeting of the Eurasian Roundtable for Corporate Governance, October*. <https://www.oecd.org/daf/ca/corporategovernanceprinciples/1930657.pdf>
- Friedman, M. (2007). The social responsibility of business is to increase its profits. In *Corporate Ethics and Corporate Governance* (pp. 173–178). Berlin, Heidelberg: Springer Berlin Heidelberg.
- Garzón Castrillón, M. A. (2021). *The concept of corporate governance*. Repositorio Institucional Digital de la Universidad Nacional de Misiones. <https://rid.unam.edu.ar/handle/20.500.12219/3565>
- Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *Q. J. Econ.*, 118(1), 107–156. <https://doi.org/10.1162/00335530360535162>.

- Grinblatt, M. & Titman, S. (1989). Mutual fund performance: An analysis of quarterly portfolio holdings. *J. Bus.*, 62(3), 393–416.
- Hagerty, M. R. & Srinivasan, V. (1991). Comparing the predictive powers of alternative multiple regression models. *Psychometrika*, 56(1), 77–85. <https://doi.org/10.1007/BF02294587>.
- Heath, J. & Norman, W. (2004). Stakeholder Theory, corporate governance and public management: What can the history of state-run enterprises teach us in the post-Enron era? *J. Bus. Ethics*, 53, 247–265. <https://doi.org/10.1023/B:BUSI.0000039418.75103.ed>
- Huberman, G. (1982). A simple approach to Arbitrage Pricing Theory. *J. Econ. Theory*, 28(1), 183–191. [https://doi.org/10.1016/0022-0531\(82\)90098-9](https://doi.org/10.1016/0022-0531(82)90098-9).
- Humpe, A. & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Appl. Financ. Econ.*, 19(2), 111–119. <https://doi.org/10.1080/09603100701748956>.
- Hungler, B. P. (1987). *Nursing Research: Principles and Methods*. Lippincott.
- Impavido, G. (2002). *On The Governance of Public Pension Fund Management*. World Bank Publications.
- IOPS. (2009). *IOPS guidelines for supervisory intervention, enforcement and sanctions*. <https://www.oecd.org/content/dam/iops/en/iops-principles-and-guidelines/IOPS-Guidelines-Supervisory-Intervention-Enforcement-Sanctions.pdf>
- Ippolito, R. A. & Turner, J. A. (1987). Turnover, fees and pension plan performance. *Financ. Anal. J.*, 43(6), 16–26. <https://doi.org/10.2469/faj.v43.n6.16>.
- Jackowicz, K. & Kowalewski, O. (2012). Crisis, internal governance mechanisms and pension fund performance: Evidence from Poland. *Emerg. Mark. Rev.*, 13(4), 493–515. <https://doi.org/10.1016/j.ememar.2012.07.006>.
- Jensen, M. C. & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. In *Corporate Governance* (pp. 77–132). Gower.
- Joppe, M. (2000). *The research process*. <http://www.ryerson.ca/~mjoppe/rp.htm>
- Kahraman, C. (2011). Investment decision making under fuzziness. *J. Enterp. Inf. Manag.*, 24(2), 126–129. <https://doi.org/10.1108/17410391111106266>.
- Khanna, V. & Zyla, R. (2012). *Survey says: Corporate governance matters to investors in emerging market companies*. Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/833251493190920250>
- Khaparde, R. & Bhute, A. (2014). Role of macroeconomic performance on stock market volatility: An Indian perspective. *Int. J. Manag. Res. Bus. Strategy*, 3(1), 48–54.
- Klapper, L. F. & Love, I. (2002) Corporate governance, investor protection and performance in emerging markets. *The World Bank, Policy Research Working Paper Series*, 2818. <https://doi.org/10.2139/ssrn.303979>.
- Kwon, C. S. & Shin, T. S. (1999). Cointegration and causality between macroeconomic variables and stock market returns. *Glob. Finance J.*, 10(1), 71–81. [https://doi.org/10.1016/S1044-0283\(99\)00006-X](https://doi.org/10.1016/S1044-0283(99)00006-X).
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2002). Investor protection and corporate valuation. *J. Finance*, 57(3), 1147–1170. <https://doi.org/10.1111/1540-6261.00457>.
- Larcker, D. F., Richardson, S. A., & Tuna, I. R. (2007). Corporate governance, accounting outcomes, and organizational performance. *Account. Rev.*, 82(4), 963–1008. <https://doi.org/10.2308/accr.2007.82.4.963>.
- Lintner, J. (1965). Security prices, risk, and maximal gains from diversification. *J. Finance*, 20(4), 587–615.
- Lishenga, L. (2011). *Corporate governance reaction to declining firm performance: Evidence from the NSE*. University of Nairobi eRepository. <https://erepository.uonbi.ac.ke/handle/123456789/13944>
- Liu, J. & Pang, D. (2009). Financial factors and company investment decisions in transitional China. *Manag. Decis. Econ.*, 30(2), 91–108. <https://doi.org/10.1002/mde.1440>.
- Lombardo, D. & Pagano, M. (1999). Legal determinants of the return on equity. *CEPR Discussion Papers*, 2275.
- Maher, M. & Andersson, T. (2002). Corporate governance: Effects on firm performance and economic growth. In *Corporate Governance Regimes: Convergence and Diversity* (pp. 386–418). Oxford University Press. <https://doi.org/10.1093/oso/9780199247875.003.0017>.
- Markowitz, H. (1952). Portfolio selection. *J. Finance*, 7(1), 77–91. <https://doi.org/10.1111/j.1540-6261.1952.tb01525.x>.
- Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *J. Financ. Econ.*, 38(2), 163–184. [https://doi.org/10.1016/0304-405X\(94\)00809-F](https://doi.org/10.1016/0304-405X(94)00809-F).
- Melis, A. (2000). Corporate governance in Italy. *Corp. Gov. Int. Rev.*, 8(4), 347–355. <https://doi.org/10.1111/1467-8683.00213>.
- Miring'u, A. N. & Muoria, E. T. (2011). An analysis of the effect of corporate governance on performance of commercial state corporations in Kenya. *Int. J. Bus. Public Manag.*, 1(1), 36–41.
- Mookerjee, R. & Yu, Q. (1997). Macroeconomic variables and stock prices in a small open economy: The case of Singapore. *Pac.-Basin Finance J.*, 5(3), 377–388. [https://doi.org/10.1016/S0927-538X\(96\)00029-7](https://doi.org/10.1016/S0927-538X(96)00029-7).
- Muhammad, N., Rasheed, A., & Husain, F. (2002). Stock prices and exchange rates: Are they related? Evidence from South Asian countries. *Pak. Dev. Rev.*, 535–550.

- Mutegi, I. & Gachunga, H. (2014). Effects of corporate governance activities on organizational performance of selected occupational retirement schemes in Kenya. *Strateg. J. Bus. Change Manag.*, 2(13), 237–255.
- Neuman, W. L. (2006). *Social Research Methods: Qualitative and Quantitative Approaches*. Pearson International Edition.
- Njuguna, A. G. (2011). Determinants of pension governance: A survey of pension plans in Kenya. *Int. J. Bus. Manag.*, 6(11), 101–111. <https://doi.org/10.5539/ijbm.v6n11p101>.
- Obermann, T. P. (2005). The effect of the privatization of pension plans on financial and regulatory systems in Latin America. *Federal Reserve Bank of Atlanta*.
- Ochieng, D. E. & Oriwo, E. A. (2012). The relationship between macroeconomic variables and stock market performance in Kenya. *DBA Afr. Manag. Rev.*, 3(1), 38–49.
- OECD. (2009). *Global forum on transparency and exchange of information for tax purposes*. OECD. <https://www.oecd.org/en/networks/global-forum-tax-transparency.html>
- OECD (2015), *G20/OECD Principles of Corporate Governance*. OECD Publishing. <http://doi.org/10.1787/9789264236882-en>.
- OECD/IOPS. (2011). *Good practices for pension funds' risk management systems*. Organisation for Economic Co-operation and Development / International Organisation of Pension Supervisors. <https://www.oecd.org/content/dam/iops/en/iops-principles-and-guidelines/OECD%20IOPS%20Good%20Practices%20for%20Pension%20Funds%E2%80%99%20Risk%20Management%20Systems%202011.pdf>
- Olweny, T. & Omondi, K. (2011). The effect of macro-economic factors on stock return volatility in the Nairobi stock exchange, Kenya. *Econ. Finance Rev.*, 1(10), 34–48.
- Ongore, V. O. & K'obonyo, P. O. (2011). Effects of selected corporate governance characteristics on firm performance: Empirical evidence from Kenya. *Int. J. Econ. Financ. Issues*, 1(3), 99–122.
- Ontita, J. & Kinyua, G. M. (2020). Role of stakeholder management on firm performance: An empirical analysis of commercial banks in Nairobi City County, Kenya. *J. Bus. Econ. Dev.*, 5(1), 26–35. <https://doi.org/10.11648/j.jbed.20200501.14>.
- Pettinger, T. (2025). *Environmental impact of economic growth*. Economics Help. <https://www.economicshelp.org/blog/145989/economics/environmental-impact-of-economic-growth/>
- Phelan, C. & Wren, J. (2006). *Exploring Reliability in Academic Assessment*. University of Northern Iowa.
- Pilinkus, D. (2010). Macroeconomic indicators and their impact on stock market performance in the short and long run: The case of the Baltic states. *Technol. Econ. Dev. Econ.*, 16(2), 291–304. <https://doi.org/10.3846/tede.2010.19>.
- PSC & SCAC. (2015). *Mwongozo: The code of governance for state corporations*. Republic of Kenya. <https://wasreb.go.ke/wp-content/uploads/2023/11/MWONGOZO-Code-of-Governance-compressed.pdf>
- Rais, S. & Goedegebuure, R. V. (2009). Stakeholder orientation and financial performance: Evidence from Indonesia. *Probl. Perspect. Manag.*, 7(3), 62–75.
- RBA (2018). *Retirement benefits industry report for December 2018*. Retirement Benefits Authority. <https://www.rba.go.ke>
- Renders, A., Gaeremynck, A., & Sercu, P. (2010). Corporate-governance ratings and company performance: A cross-European study. *Corp. Gov.*, 18(2), 87–106. <https://doi.org/10.1111/j.1467-8683.2010.00791.x>.
- Roll, R. & Ross, S. A. (1980). An empirical investigation of the Arbitrage Pricing Theory. *J. Finance*, 35(5), 1073–1103. <https://doi.org/10.1111/j.1540-6261.1980.tb02197.x>.
- Ross, S. A. (2013). The arbitrage theory of capital asset pricing. In *Handbook of the Fundamentals of Financial Decision Making: Part I* (pp. 11–30). World Scientific Publishing. https://doi.org/10.1142/9789814417358_0001.
- Schulzer, M. (1994). Diagnostic tests: A statistical review. *Muscle Nerve*, 17(7), 815–819. <https://doi.org/10.1002/mus.880170719>.
- Sharan, V. (2009). *Fundamentals of Financial Management*. Pearson India.
- Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *J. Finance*, 19(3), 425–442. <https://doi.org/10.1111/j.1540-6261.1964.tb02865.x>.
- Shleifer, A. & Vishny, R. W. (1997). A survey of corporate governance. *J. Finance*, 52(2), 737–783. <https://doi.org/10.1111/j.1540-6261.1997.tb04820.x>.
- Singh, D. (2010). Causal relationship between macro-economic variables and stock market: A case study for India. *Pak. J. Soc. Sci.*, 30(2), 263–274.
- Soumaya, K. (2015). Agency Theory and corporate governance: An empirical analysis. *Corp. Gov. Int. Rev.*, 23(2), 99–112. <https://doi.org/10.3923/ibm.2015.805.815>.
- Stewart, F. (2009). Pension funds' risk-management framework: Regulation and supervisory oversight. *International Organization of Pension Supervisors Working Paper*, 11.
- Stewart, F. & Yermo, J. (2008). Pension fund governance: Challenges and potential solutions. *OECD Working Papers on Insurance and Private Pensions*, 18. <https://doi.org/10.1787/241402256531>.

- Tapia, W. (2008), Comparing aggregate investment returns in privately managed pension funds: An initial assessment. *OECD Working Papers on Insurance and Private Pensions*, 21. <http://doi.org/10.1787/237833258822>.
- Tonks, I. (2006). Pension fund management and investment performance. In *The Oxford Handbook of Pensions and Retirement Income* (pp. 456–480). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199272464.003.0023>.
- Urwin, R. (2010). Sustainable investing practice: Simplified complexity. *Towers Watson Technical Paper*, 1656988. <https://doi.org/10.2139/ssrn.1656988>.
- Useem, M. & Mitchell, O. S. (2000). Holders of the purse strings: Governance and performance of public retirement systems. *Soc. Sci. Q.*, 81(2), 489–506.
- Wanjiku, E. (2014). *The effect of macroeconomic variables on portfolio returns of the pension industry in Kenya* [Doctoralthesis]. University of Nairobi.
- Yang, T. & Mitchell, O. S. (2005). Public pension governance, funding, and performance: A longitudinal appraisal. *Wharton Pension Research Council Working Papers*.
- Zahra, S. A. & Pearce, J. A. (1989). Boards of directors and corporate financial performance: A review and integrative model. *J. Manag.*, 15(2), 291–334. <https://doi.org/10.1177/014920638901500208>.
- Zikmund, W. G. (2003). *Business Research Methods*. South-Western College Publishing.
- Zona, F., Gomez-Mejia, L. R., & Withers, M. C. (2018). Board interlocks and firm performance: Toward a combined agency–resource dependence perspective. *J. Manag.*, 44(2), 589–618. <https://doi.org/10.1177/0149206315579512>.