

INVESTMENT STRATEGIES, FUND SIZE AND FINANCIAL PERFORMANCE OF DEFINED CONTRIBUTION SCHEMES IN KENYA: THEORETICAL REVIEW

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ABSTRACT

The government directive via Treasury Circular No. 18/2010 required State Corporations to convert from Defined Benefit Schemes (DBs) to Defined Contribution Schemes (DCs) design not later than 1st July 2011. This was to enable the schemes meet funding requirements as required by the retirement's benefits authority (RBA). Investors for DCs in Kenya have been faced with scheme overreliance on conservative investment options which are skewed towards fund manager default investment strategies protecting the fund manager at the expense of the pension investor. This has resulted to pension members' exposure to longevity and investment risks. It is thus essential

that members adopt the right investment strategies for their assets class to ensure the highest return possible at maturity and also the minimum risk exposure to their fund investment. This paper provides a background, theoretical review and empirical review on DCs investment strategies, fund size and financial performance respectively in Kenya. This paper concludes that fund size significantly influences investment strategy choice resulting to improved financial performance for Defined Contribution Schemes in Kenya.

***Key Words:** investment strategies, fund size, financial performance, defined contribution schemes*

INTRODUCTION

According to Attah (2014) and Ahmad and Nor (2015) a pension is an arrangement which provides people with income when they are not earning one regularly. OECD (2009) defines a pension fund as a legally separated pool of assets purchased using contributions to a pension fund for exclusive purpose of financing pension fund retirement benefits. Their primary function is to invest these contributions optimally given selected investments and restrictions (Mariba, 2018, Canadian institute for health information, 2014). Njuguna (2010), states that pension funds are a very important source of retirement income for millions of people in the world. They also help the government in achieving its development objectives (Kibet and Simiyu, 2016).

However, Rono (2010) asserts that long-run financial performance of pension fund managers and trustees in Kenya has slowed down resulting to pension industry investor complain on lack of diversity with majority of investments being channelled to real estate. Pension fund managers have also complained of few investment avenues/ vehicles for investing pension funds (Rono, 2011). Also, Membership to the industry is low compared to all other financial sectors in Kenya as it stands at approximately 19% (Keizi, 2006, CBK financial sector report, 2018). This is despite the increase in membership from 16% in 2012 to 19% in 2018 (RBA report, 2018). According to Mutuku, Kathurima, and Toroitich (2013) pension industry investments have been subject to significant volatility resulting in large variation in investment performance which contribute to negative returns periods, even to those schemes invested in guaranteed funds.

The governance structures for pension industry include the sponsors, custodians, the Trustees, the administrators, the fund managers and the members who are mandated to ensure optimum savings mobilization, proper investment of pension funds and efficient disbursement of benefits to those who retire within the pension system (Mugenda, Maina, Kimani, Nawire, Wamburu and Mwangi, 2014, and Njuguna, 2011).

Pension Schemes in Kenya

According to RBA website (2019), and Kipanga, Were and Toroitich (2013), Ngugi, Njuguna and Wambalaba (2018), Ngugi and Njuguna (2018), pension scheme categories in Kenya are grouped into the following schemes; National Social Security Fund (NSSF), which is a funded mandatory scheme where employers and employees are mandated to make joint monthly contributions of a flat amount of Kshs. 400 in total with the employer and employee making flat amounts of Kshs. 200, Occupational Retirement Schemes (ORs) which are employment based and voluntary in nature funded by employer and employee contributions. ORs include Defined Benefit (DBs) and Defined Contributions (DCs) being the majority; Individual Retirement Benefit Scheme (IRs) are operated by independent financial institutions and membership is open to anyone willing to save for retirement; and the Civil Service Pension Scheme (CSPs) which is established under an act of Parliament to provide retirement benefits for all civil servants is funded through government revenue collections (Chirchir, 2010). Kenya pension industry has been experiencing an increase in number of DCs as many OCs schemes convert from DBs to DCs as a result of small scale nature of sponsor business, highly mobile youth workforce, increased company liabilities, complexities in the computing DBs liabilities and inability to meet funding requirements by the regulator (RBA Report, 2010, Chirchir, 2010, and Adkins, 2010).

Investment and DCs

Pandey (2011) asserts that investment involves a company's decision to invest its current funds most efficiently in long-term assets in anticipation of an expected flow of benefits over a series of years. Pension scheme member's funds to defined contribution schemes should be invested in diversified portfolios, non-conservative securities, dynamic asset allocation, and with freedom in strategy adopted (Antolina, Blome, Karim, Payet, Gerhard, and Yermo, 2009).

However in Kenya, pension investors in defined contribution schemes have raised concerns on how their pension investment decisions are handled due to overreliance on default conservative investment options which earn small returns (Chirchir, 2010). The Central Bank of Kenya (CBK) sector report (2017) reports that, DCs investments have been skewed towards fund manager default conservative investment strategies.

| Asset Category | December, 2015 | | December, 2016 | | December, 2017 | |
|------------------------|----------------|---------------|----------------|---------------|----------------|---------------|
| | KSh. Billions | Percent | KSh. Billions | Percent | KSh. Billions | Percent |
| Government Securities | 242.43 | 29.78 | 349.15 | 38.26 | 394.19 | 36.5 |
| Quoted Equities | 186.81 | 22.95 | 159.07 | 17.43 | 210.17 | 19.46 |
| Immovable Property | 150.78 | 18.52 | 178.42 | 19.55 | 226.72 | 20.99 |
| Guaranteed Funds | 99.4 | 12.21 | 129.58 | 14.2 | 142.97 | 13.24 |
| Listed Corporate Bonds | 48.09 | 5.91 | 46.95 | 5.14 | 41.99 | 3.89 |
| Fixed Deposits | 55.61 | 6.83 | 24.57 | 2.69 | 32.88 | 3.04 |
| Offshore | 7.16 | 0.88 | 6.96 | 0.76 | 12.77 | 1.18 |
| Cash | 11.26 | 1.38 | 12.93 | 1.42 | 12.95 | 1.2 |
| Other Assets* | 12.57 | 1.54 | 5.03 | 0.55 | 5.47 | 0.5 |
| TOTAL | 814.11 | 100.00 | 912.66 | 100.00 | 1080.11 | 100.00 |

Figure 1: Overall Pension Industry Investment Portfolio (Ksh. Billion)

Source: (RBA, 2017)

Fund size in DCs

Pension fund size is a significant determinant of pension performance and is measured by pension contributions, number of active members, number of active schemes, and active assets (Kigen, 2016 and KRBA, 2010). Kenya Retirement Benefits Authority (RBA) categorizes schemes as per their size measured by per value of their assets for levy payment purposes (Njoroge, 2014). Michira (2013), states that size matters when choosing a retirement scheme to join. He concludes that bigger pension schemes outperform smaller ones due to economies of scale. This is in contrast to findings by Bauer (2010) who states that fund size negatively affects scheme performance

Investment Strategies

According to Onyango (2010), an investment strategy is a arrangement that guides the choice of investment decision a pension fund makes. It determines the investment mix of total funds for a pension scheme that aims at attaining a balance between investment returns and risks respectively (Eichholtz and Margaritova, 2009).

According to Njuguna (2010) there has been an increase in available investment avenues for pension funds and relaxation of investment guidelines for pension investors. RBA sector report (2017), states that the pension industry sector introduced new investment guidelines to broaden the range of investment. Onyango (2010) identifies this investment blend to consist of private equity, venture capital, real estate investment trusts, immovable property and bonds. However, Chirchir (2010) asserts that these fresh investment guidelines adopted were inappropriate.

According to Koetsier and Bikker (2018), investors in DCs tend to possess herding behaviour traits thus sticking with an investment choice for a longer duration of time even despite introduction of new investments. Antolin, Payet and Yermo (2010) assert that member funds

in DCs can be invested in four asset classes consisting of cash, government bonds, inflation-indexed bonds and equities. They further state that these assets can be invested using three investment strategies; life-cycle investment strategies, dynamic investment strategies and fixed investment strategies.

Ahmad and Nor (2015) state that pension funds investments strategies can be classified into conservative investments strategies, (fixed income securities and local market investments) and aggressive investments investment strategies (investments in equities) and fund performance is measured using return on investment . also, According to their study, Performance of pension funds can also be measured using administration expenses, management and custody expenses, magnitude of contribution as well as member behaviour in selecting retirement age.

PROBLEM STATEMENT

The performance of pension schemes in Kenya has been indicated to be poor (Were, Amuhayalravo, and Wanjala, 2017). This is so because managers for DCs have had no incentive to minimise costs to scheme members which have resulted to low investment returns, and in some cases delay of benefits upon retirement (Tari (2014). Also, the current investment portfolio for DCSs in Kenya is highly concentrated in few investment categories; equities, government securities and real estate, thus exposing them to interest rate risks, market risks and liquidity risks (Pension industry report, 2017). This is a problem facing the investors since these schemes do not have a set promise of returns to members (Njuguna, 2010). Occupational DCs pension scheme members have no ability to make investment choices or have a limited ability for the same (a limited set of choices) and as a result this makes pension managers liable for choosing an investment strategy to adopt on behalf of the member. It has also been noted that, when given a high level of choice and faced with complexity the average pension scheme member tends to make suboptimal decisions which are based on fast information processing and influenced by various heuristics and biases (Kahneman, 2012). According to Bryne (2008), members under DCs bear the investment risk and longevity risk unlike DBs and therefore it is of importance that the right investment strategy is adopted for member contributions to prevent decline in scheme performance. Therefore, the purpose of this study will be to determine the moderating effect of fund size on the relationship between investment strategies and financial performance of DCs in Kenya.

THEORETICAL REVIEW

Agency Theory

This theory was first developed by Adam Smith (1937) in his work “the wealth of nations”, stating that if an association is managed by other persons other than owners, there is a chance they may not work for owner’s benefit. The theory has been studied and developed by several researchers as indicated below; Wilson (1968) and Arrow (1971), described agency problem utilising the process of risk sharing among cooperating parties. Ross (1973) and Mitnick (1975) regarded agency problem as a hitch of incentives and a problem resulting from

institutional structure too. Alchian and Demsetz (1972) and Jensen and Meckling (1976) described a firm as a set of contracts and agency problem as an agreement between principal and agent where both parties work for own benefit. Fama and Jensen (1983), segregated firm's decision process into decision management and decision control. Agency problem will arise in executive decision process since verdict makers who initiate and implement the decisions of the firm are not the real carrier of the wealth effects of their choices.

Grossman and Hart (1983) discussed the idea on deviation of risk preference between the principal and agents. They stated that expenditure of the principal is affected by the agent output and agents' effort affects firm's output. Eisenhardt (1989); Panda and Leepsa (2017, 2018, and 2018), Logan (2000), Thierry (2018), Ronen, Kasha and Balachandran (1995) and Xu, Zhu and Lin (2005) categorised agency theory into two models; positive agency model, and principal agent model. Both models are based on principal agent model but principal agent model is more mathematical

Perrow (1986) criticised that positivist agency researchers have only concentrated on agent side of principal agent relationship ignoring that the problem may also come from the principal side. This has led to advance of behavioural agency theory by Wiseman and Gomez-Mejia (1998), Sanders and Carpenter (2003), and paper and Gore (2012) indicating that agents as major element in the agent –principal relationship have their performance depending on their motivation, ability and perfect opportunity.

Eisenhardt (1989), Shleifer and Vishny (1997) and Daily (2003), however state that this theory assumes that agency problem can be solved using agreement but however suffers from hindrances like information asymmetry, rationality, fraud and transaction cost; shareholders interest is maximise their return but this role is limited to the firm; the role of directors are only limited to monitor the managers and their further role is not clearly defined, and the theory considers managers as opportunists and ignores their competency (Gonzalez, Martin and Zellwege (2018)

The life cycle theory of investments (Modigliani and Miller, 1950s)

According to Dolphin (2011), this theory states that every individual will go through various life cycle stages, in which investment needs are different. First when young there is the accumulation phase (20's and 30's), when the individual is able to invest in higher risk assets and follow an aggressive investment strategy, designed to achieve maximum longer term growth. Second stage is the "consolidation phase" in mid life (40's and 50's) in which the individual is in mid-career and has accumulated assets to cover the important needs of housing, and living expenses and now is looking for opportunities to increase wealth generation. The individual has more resources to devote to investment but with a less risk.

The third stage is the "decumulation phase", (age 60's to 70's) during which the individual is no longer working but living on the income and capital accumulated in the first two phases. Then there is the "gifting phase" (80s to 90s) upon which individuals who have

accumulated far more wealth than they will need for their life, decide to pass some of it to others. The implication of this theory is that, individuals will adopt aggressive investment strategies when young but change to conservative strategies of investment as they progress in their life time (Deaton, 2005).

Modern Portfolio Theory (MPT): Harry Mackowitz (1952)

The theory focuses on explaining investor behaviour given risk and return expected. This theory states that investors are rational and hence will bear more risk if they believe return is able to fully compensate risk (Johnson, 2015). The factor of consideration is risk and given two securities a rational investor would choose the less risky

According to Hannes and Sara (2012), weaknesses in the theory make it unreliable alone hence its development. Tobin (1958) developed the theory to obtain efficient frontier and the capital market line. This theory forms the basics of diversification (Pandey, 2009) and advises that investment in several securities reduces unsystematic risks. According to Mangram (2013), it is not enough to invest in many securities to diversify but it is necessary to avoid investing in securities with high covariance.

EMPIRICAL REVIEW

Life-cycle investment strategies and financial performance of DCs

Bagliano, Fuggazza & Nicodano (2009), Vaan, Fano & Nicodano (2014) and Vaan Fano & Nicodano (2014) studied pension fund, life cycle asset allocation and performance evaluation. The study results indicated that asset allocation sensitivity to changes in labour income profiles suggest that pension plans should offer different investment options for workers who require heterogeneous asset allocations. It is however promising to evaluate the performance and the associated participants' welfare costs of simple guidelines more easily implementable by pension funds that partly account for the heterogeneity of optimal portfolio shares, e.g. by grouping members into age classes and applying the optimal "median" share to all members in a specified class.

Wang, Li, and Liu (2017) did a study on Understanding the Leveraged Life Cycle Investment Strategy for Defined-Contribution Plan Investors using mutually past and bootstrap simulations for the era 1900-2011 in the US. They assert that the leveraged life cycle strategy has ability to reduce risk, though this ability is moderately insignificant.

Blake, David and Wright, Douglas and Zhang, Yumeng (2011) did a study on Age dependent investing: Optimal funding and investment strategies in DCs pension plans when members are rational life cycle financial planners. They found out that optimal funding strategy involves a payment rate that is not steady over the life of the plan but is age-dependent and reflects the swap between the desire for current versus future consumption, the desire for stable consumption over time, the member's attitude to risk, and changes in the level of human capital over the life cycle.

Inkmann and Shi (2016) did a study on life cycle patterns in the design and adoption of default funds in DC pension plans. They found out that there is a negative relationship between the share of risky assets in the default fund of a defined contribution (DC) pension plan and the average plan member age if trustees design the default fund in line with predictions from the life-cycle portfolio choice theory. The study also found out that approval of the default fund should be low in DC plans with high member age dispersion if default funds are indeed designed for the average plan member and members become aware of this.

Bikker, Broeders, Holladers and Ponders (2009); Defau and De Moor (2018) did a study on Pension funds asset allocation and participant age: a test of the life cycle model. They found out that pension funds take the average of their member's age into account. However, the average age of their active participants has been incorporated much more strongly in the investment behaviour than the average ages of retired and dormant participants. Implying that, more interest is shown to the active participants than retired and dormant participants.

Ngugi, Njuguna and Wabalaba (2018) studied the "Influence of Pension Scheme Maturity on Investment Strategies of Pension Funds in Kenya". The study results conflicts the life cycle theory by stating that scheme maturity does not influence the investment strategies of occupational schemes in Kenya. This study differs in that it has investment strategies as independent variables whereas DCs financial performance is the dependent variable.

Katerina L and Kateryna B (2017) studied the Effects of population ageing on the pension systems in Belarus shows that the increase in retirement age 65 years of age for both genders has a strong positive effect on the sustainability of the pension system and keeps the deficit below 2% of GDP.

Carole and Minsuk (2014) Bernard and Kwak (2016) studied Dynamic Preferences for Popular Investment Strategies in Pension Funds using constant proportion portfolio insurance (CPPI) strategy and a life-cycle strategy which are part of dynamic investment strategies. In Black-scholes market with deterministic parameters, the study showed that traditional life-cycle funds are not optimal to any expected utility maximizes.

Dynamic investment strategies and financial performance of DCs

Antolin, Payet, and Yermo (2010) studied the assessment of default investment strategies in DCs. Their study found that there is no "one-size-fits all" default investment strategy. It concludes that dynamic investment strategies deliver comparable replacement rates adjusted by risk than more deterministic strategies at least in the payouts in form of variable withdrawals.

Andreas Zingg (2008) studied Dynamic investment strategies for Swiss Pension funds. He found out that dynamic strategies can be an eye-catching alternative to a static investment strategy in some circumstances. Also, he found out that dynamic investment strategies have

the potential to offer a more attractive risk-return spectrum than a static buy-and-hold strategy for the risk and return measures

Fixed investment strategies and financial performance of DCs

Mungai (2017) researched on “The effect of alternative Investments on the Financial Performance of Pension Funds in Kenya”. Alternative investments were private equity, venture capital, real estate investment trusts, immovable property and bonds. He found out that majority of pension schemes had largest allocation in fixed income and government securities, and quoted equity, with little allocation in private equity and venture capital and real estate investment trusts. All alternative investments except venture capital and private equity were found to possess positive relationship with pension financial performance. The study did not cover traded derivatives and the period covered was short term not exceeding five years. The study also did not focus on defined contributions alone.

Harrison and Blake (2008) researched on “Defined Contribution Pensions: Dealing with the reluctant investor”. In reference to the investment choice particularly the default funds. The study was conducted on the basis that investors (members in a defined contribution fund) are relaxed in assuming an investment strategy given the wide options available whereas the fund managers and the trustees, and employers are reluctant to take these steps for fear of incurring liability for any adverse outcomes. The study did not include fund size as a variable moderating the relationship despite the conclusion that investment choice influences financial performance of defined contribution schemes.

Koetsier and Bikker (2018) studied “Herding Behaviour of Dutch Pension Funds in Asset Class Investments”. Their study found out that asset investment in pension fund investments portrays a herding behaviour which is destabilizing on the buy side and stabilizing on the supply side of pension assets. Again this study focused on all pensions while this study focuses on DCs alone.

Antolin, Blome, Karim, Payet, Peek and Scheuenstuhl, and Yermo (2009) studied “Investment Regulation and Defined Contribution Pension Scheme” by assessing the impact of different quantitative approaches to regulate investment risk on the retirement income stemming from defined contribution (DC) pension plans. They focused on how regulations affect investment strategies eventually affecting retirement income obtained from those investments. The study found out that adoption of conservative investment strategies results to a decline in a downside risk on retirement income from DCs investment increasing funds available to fund retirement costs. This study adopted investment strategies as a moderating variable influencing relationship between regulation and financial performance of DCs. This current study will adopt investment strategies as independent variable while fund size will be moderating variable

Onyango (2010) did a study on “The Relationship between Investment Strategies and Financial Performance of Pension Funds in Kenya”. The study found out that financial

performance of schemes depends on investment strategies that the scheme applies on its funds. The study also states that risky assets (equity investments) have a higher return than the non risky investments (bonds). This study adopted board size as a variable to influence the relationship between the independent and dependent variables. This present study will adopt the fund size as moderator and not the board size.

Chovancova and Arendas (2015) did a study on “Long-term Passive Investment Strategies as a Part of Pension Systems”. The paper compared long-term regular investing in conservative instruments of money market (T-bills and Deposit accounts) and indexing (Investing in a portfolio of stocks that tracks a benchmark stock index) in USA, Japan and Germany between 1985 and 2014. Results show that regular investing leads to the cost averaging effect that proves to eliminate the impact of market turbulence significantly in the long term. It again states that indexing is superior to conservative investment strategies. This study differs with in that it will also view performance of aggressive strategies, and consideration will be for both short term and long term periods.

Enrique, Morales, Fuentes, Searle and Stewart (2017) did a study on “Pension Funds and the Impact of Switching Regulation on Long term Investments”. The study focused on evaluating the impact of member’s ability to switch pension fund provider and/or portfolio on the allocation of pension funds to long term investments. The paper found out that greater movement between pension fund providers and between portfolios is linked to increased holdings of short term and more liquid assets. Frequent switching eventually results to poor investment returns to pension members. This study will focus on both short term and long term investment strategies.

Fund size and financial performance of DCs

Kigen (2016) did a study on the “Effect of Fund Size on the Financial Performance of Pensions in Kenya”; by adopting density of contribution, cumulative assets, retirement age, size and cost of membership as measures of fund size. The study found out that pension contribution, costs and accumulated fund assets significantly affected pension fund performance. This study utilizes fund size as a moderating variable and not an independent variable as addressed by Kigen (2016).

Another study was done by Dyck and Pomiorski (2010) did a study on “Is Bigger Better?; Size and Performance of Pension Plan Management. They focused on DCs, and the study found out that, largest pension plans outperform smaller ones by 45-50 basis points per year on a risk adjusted-basis. Bikker (2013) states that there is no a one size fits all for pension fund investment schemes.

Njoronge (2014) did a study on effects of firm size on financial performance of pension schemes in Kenya. The study concludes that that there has been significant market volatility as evident from the NSE index, Treasury bill rate movement and offshore indices. Vasile and Maria (2011) contacted a study on analysis of the correlation between size and performance

of private pension funds in Romanian private pension environment. The study found out that pension fund size erodes performance.

Smits (2011) did a study on Does pension fund size matter for better performance? The study found out that there are no significant relationships between the pension fund size and the absolute performance, the relative performance, and the funding ratios. Funding ratios are significantly influenced by pension fund performance, and show a positive relationship. The rest of the performance is influenced other factors like longevity risk and inflation risk.

Ngugi and Njuguna (2018) did a study on Nexus between Pension Fund Size, Design and Investment Strategy: A Review of Occupational Retirement Benefits Schemes in Kenya. Their study found out that larger schemes adopted a riskier investment strategies compared to their smaller counterparts. However, the investment strategies are not informed by the fund designs. Trustees of retirement benefit schemes are therefore advised to focus their investment strategies to avoid exposing the residual claimants to excessive risk.

Antolin, Payet, and Yermo (2010) studied dynamic performance effect on DCs using replacement rate as a measure of DCs financial performance. This research work will use replacement rate, return on investment and contribution magnitude. Researches by Kigen (2016), Kigen (2016), Dyck and Pomiorski (2010) have adopted fund size as an independent variable as opposed to this work where it will be adopted as a moderating variable. Also, the study findings have conflicting results.

CONCLUSION

Empirical review concludes that, of the three strategies reviewed (life cycle, dynamic and fixed investment strategies respectively), life cycle investment strategies have a more significant effect to financial performance of DCs. This research work will be of importance to the key stakeholders in pension industry including, trustees, sponsors, fund managers, regulators and potential investors by addressing both geographical and knowledge gaps identified. It will address this gap through creating a relationship between fund size, investment strategies and financial performance of DCs.

REFERENCES

- Ahmad.Z and Nor.E (2015). Pension fund performance in East Asia. A Comparative study. *Eurasian Journal of Economics and Finance*, 3(2), 2015, 42-61.
- Alexander Dyck Lukasz Pomorski (2010). Is Bigger Better? Size and Performance in Pension Plan Management. *Journal of economic literature*.
- Alistair Byrne, Debbie Harrison, David Blake, (2008). Defined contribution pensions: dealing with the reluctant investor. *Journal of Financial Regulation and Compliance*, Vol. 16 Issue: 3, pp.206-219.
- Ammann, M., & Zingg, A. (2010). Performance and governance of Swiss pension funds. *Journal of Pension Economics & Finance*, 9(1), 95-128.

- Antolin, P., Payet, S., & Yermo, J. (2010). Assessing default investment strategies in defined contribution pension plans. *OECD Journal: Financial Market Trends*, 2010(1), 87- 115.
- Bagliano, F. C., Fuggazza, C., & Nicodano, G. (2009). Pension funds performance evaluation: a utility based approach.
- Bikker J, Broeders B, Hollanders D, and Ponds E (2009). Pension funds asset allocation and participant age: a test of the life cycle model: Amsterdam, Nether lands.
- Bikker, J. A. (2017). Is there an optimal pension fund size?: A scale-economy analysis of administrative and investment costs. In *Pension Fund Economics and Finance* (pp.25-56). Rout ledge .
- Blake, David and Wright, Douglas and Zhang, Yumeng (2011). *Age dependent investing: Optimal funding and investment strategies in defined contribution pension plans when members are rational life cycle financial planners. Journal of Economic Dynamics and Control*, 38, 105-124.
- Bernard, C., & Kwak, M. (2016). Dynamic preference for popular investment strategies in pension funds. *Scandinavian Actuarial Journal*, 2016(5), 398-419.
- Carole B and Minsuk K (2014). Dynamic Preferences for Popular Investment Strategies in Pension Funds.
- The Kenya Financial Sector Stability Report; Financial Sector Regulators Forum, September 2018, Issue No. 9.
- Chovancova, B., Arendas, P. (2015). Long Term Passive Investment Strategies as a Part of Pension Systems. *Economics and Sociology*, Vol. 8, No 3, pp. 55-67.
- Defau, L., & De Moor. (2018). The impact of plan and sponsor characteristics on pension funds' assets allocation and currency diversification. *Journal of Asset Management*, 19(10), 27-37.
- Enrique A, Morales P, Fuentes O, Searle P, and Stewart F (2017). *Pension Funds and the Impact of Switching Regulation on Long-term Investment*; The World Bank.
- Fugazza, C., Giofre, M., & Nicodano, G. (2009). Can Pension Funds Hedge wage Risk?.
- Hinz R, Heinz P. Rudolph, Antolín P, and Juan Yermo (2010). *Evaluating the Financial Performance of Pension Funds*. The World Bank.
- Jonkhart, M. J (1979). On the term structure of interest rates and the risk of default: an analytical approach. *Journal of Banking and Finance*, 3(3), 253-262.
- Kipanga, B., Were, M., & Toroitich, C. (2013). Impact of conversion of Kenya state corporations' retirement benefits schemes from defined benefits to defined contribution.
- KOH, Seng Kee, Benedict; Mitchell, Olivia S.; and Fong, Joelle H. Y. (2010). Collective investments for pension savings: Lessons from Singapore's central provident fund scheme. *Pensions: An International Journal*. 15, (2), 100-110.
- Koetsier and Bikker (2018). Herding Behaviour of Dutch Pension Funds in Asset Class Investments.
- Logan, M. S. (2000). Using agency theory to design successful outsourcing relationships. *The International Journal of Logistics Management*, 11(2), 21-32.
- Mungai (2017). The effect of alternative Investments on the Financial Performance of Pension Funds in Kenya; A Master's Thesis, School of Business. University of Nairobi.
- Myles E. Mangram (2013). A simplified perspective of the Markowitz portfolio theory. *Global journal of business research*; 7(1), 59-70.

- Ngugi W and Njuguna A (2018) Nexus between Pension Fund Size, Design and Investment Strategy: A Review of Occupational Retirement Benefits Schemes in Kenya. *International Journal of Financial Research*. Vol. 9, No. 3.
- Ngugi, W., Njuguna, A., & Wambalaba, F. (2018). The Influence of Pension Scheme Maturity on Investment Strategies of Pension Funds in Kenya. *International Journal of Business and Management*, 13(10).
- Njuguna, A . G. (2010). *Strategies to improve pension fund efficiency in Kenya* (Doctoral dissertation, Nelson Mandela Metropolitan University).
- Njuguna, A. G. (2011). Determinants of pension governance: A survey of pension plans in Kenya.
- Njoronge (2014) Effect of firm size on financial performance of pension schemes in Kenya. *Unpublished MBA Project*.
- Panda, B., & Leepsa, N.M (2017). Agency theory: Review of Theory and evidence of problems and perspective. *Indian Journal of Corporate Governance*, 10(1), 74-95.
- Panda, B., & Leepsa, N. M. (2018). Institutional Ownership Activism, Market Performance, and Financial Crisis: Evidence from an Emerging Market. *Asia Pacific Social Science Review*, 17(3), 44-62.
- Panda, B., & Leepsa, N. M. (2019). Does Institutional Ownership engagement matter for greater financial performance? Evidence from a developing market. *International Journal of Law and Management*, (just accepted), 00-00.
- Ronen, J., Kashi, R, and Balachandran. (1995). Agency theory: An approach to incentive problems in management accounting. *Asian Review of Accounting*, 3(3), 127-151.
- Salome Chirchir (2010). Conversion of Defined Benefit schemes to Defined contribution Schemes. *Retirements Benefits Authority*.
- Sharpe W. F (1978). New evidence on capital asset pricing model: Discussion. *Journal of Finance*. 33(3). 917-920.
- Smits (2014) Does Pension Fund Size Matter for Better Performance.
- Thierry, A. Z. (2018). Equitable Compensatory System and Efficiency of the Cameroon Customs Administration. *Research Journal of Advanced Engineering and Science*, 3(4), 109-118.
- Vaan, D., Fano, M., & Nicodano, G. (2014). A reporting Standard for Defined Contribution pension plans.
- Vasile and Maria (2011). An Analysis of the Correlation between Size and Performance of Private Pension Funds. *Journal of Theoretical and Applied Economics*, Volume XVIII(2011), No. 3(556), pp. 107-116.
- Wang, Li, and Liu (2017). Understanding the Leveraged Life Cycle Investment Strategy for Defined-Contribution Plan Investors: *Financial Research Journal*. PP 12
- Xu, L. C., Zhu, T., & Lin, Y. M. (2005). Political control, agency problems and ownership reform: evidence from China. *Economics of Transition*, 13(1), 1-2.