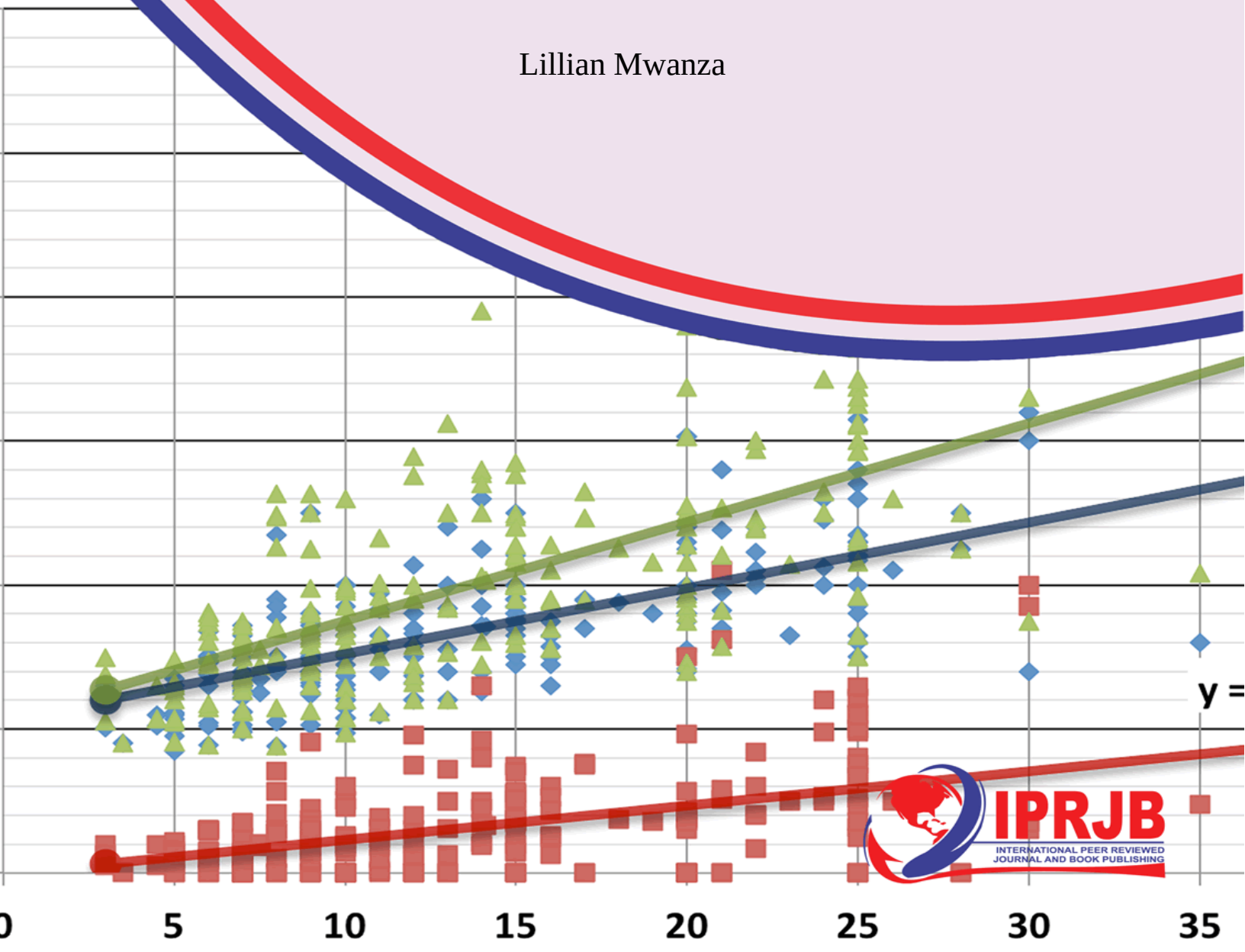
Journal of
Statistics and Acturial Research
(JSAR)

Forecasting Pension Fund Liabilities Using Economic and Demographic Factors in Zambia

Lillian Mwanza



Journal of Statistics and Actuarial Research
ISSN: 2518-881X (Online)
Vol.8, Issue 1, No.4. pp. 35 - 44, 2023

www.iprjb.org

Forecasting Pension Fund Liabilities Using Economic and Demographic Factors in Zambia

Lillian Mwanza

Zambia Open University

Article History

Received 20th February 2024

Received in Revised Form 30th March 2024

Accepted 14th April 2024

How to Cite
Mwanza, L. (2024). Forecasting Pension Fund Liabilities Using Economic and Demographic Factors in Zambia. *Journal of Statistics and Actuarial Research*, *8*(1), 35 – 44.
https://doi.org/10.47604/jsar.2756

Abstract

Purpose: The aim of the study was to analyze the forecasting pension fund liabilities using economic and demographic factors in Zambia.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: Forecasting pension fund liabilities in Zambia highlight the critical influence of economic and demographic factors. Key indicators such as GDP growth, inflation, interest rates, population aging, and life expectancy significantly impact projections of future pension obligations. Accurate modeling integrating these variables is essential for informed decision-making by administrators and policymakers to ensure financial sustainability for retirees in Zambia.

Unique Contribution to Theory, Practice and Policy: Life cycle hypothesis (LCH), dependency ratio theory & asset liability management (ALM) may be used to anchor future studies on analyze the effect of organizational culture on knowledge sharing and retention among public sector employees in South Africa. Pension funds should adopt advanced asset liability management (ALM) strategies that align investment portfolios with long-term liabilities. Policymakers should establish regulatory frameworks that allow for flexibility in pension fund management, particularly in response to economic crises and demographic changes.

Keywords: *Forecasting Pension Fund Liabilities, Economic, Demographic Factors*

©2024 by the Authors. This Article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/)

Journal of Statistics and Actuarial Research
ISSN: 2518-881X (Online)
Vol.8, Issue 1, No.4. pp. 35 - 44, 2023
www.iprjb.org

INTRODUCTION

Pension fund liabilities refer to the estimated future financial obligations that a pension fund is expected to pay out to its beneficiaries, typically retirees, over their remaining lifetimes. in developed economies such as the USA, Japan, and the UK represent significant financial commitments due to aging populations and longer life expectancies. In the USA, for instance, pension obligations have been steadily increasing. According to recent data, pension fund liabilities for state and local government plans in the USA reached approximately $4.4 trillion in 2020, reflecting the growing burden on public finances (Smith, 2020). Similarly, in Japan, where the aging population is more pronounced, pension liabilities have surged. Statistics indicate that Japan's public pension system faces an estimated shortfall of ¥100 trillion by 2040, highlighting the strain on fiscal sustainability (Tanaka, 2019).

In addition to the USA, Japan, and the UK, other developed economies face substantial pension fund liabilities. For example, in Germany, pension obligations are a significant component of public expenditure. As of 2021, Germany's statutory pension system projected a steady increase in liabilities due to demographic aging, necessitating ongoing reforms to ensure long-term sustainability (Börsch-Supan, 2021). Similarly, in Canada, where the population is also aging, pension obligations have been a focus of policy discussions. Statistics indicate that Canada's public pension system, including the Canada Pension Plan (CPP), faces pressures from demographic shifts, requiring adjustments to maintain financial stability (Robson & Busby, 2020).

Beyond the previously mentioned countries, Australia provides an insightful example of pension fund management. The Australian superannuation system, compulsory for most employees, faces challenges similar to other developed nations, including balancing contributions with future liabilities amid demographic aging (Wilkins, 2020). As of recent data, Australia's superannuation assets surpassed AUD 3 trillion, highlighting the significant scale and importance of managing these funds for retirement security (ASFA, 2021). In Sweden, a pioneer in pension reform, the Swedish pension system incorporates a mix of public and private components. Recent reforms have focused on sustainability, ensuring that future pension commitments are adequately funded while adapting to demographic changes and economic fluctuations (Edin & Lagergren, 2019).

In developing economies, pension fund liabilities also pose challenges, albeit in different contexts. For example, in Brazil, the pension system has faced significant reform efforts to manage its liabilities. By 2022, Brazil's public pension system is projected to require substantial funding adjustments to address demographic shifts and financial sustainability concerns (Lima, 2021). Similarly, in India, the Employees' Provident Fund Organization (EPFO) manages a large pension liability for its workforce. Recent reforms aim to modernize and stabilize the EPFO's financial obligations amidst increasing longevity and demographic changes (Chakraborty, 2020).

Moving to other developing economies, Mexico provides an interesting case of pension fund liabilities management. The Mexican pension system, including the Instituto Mexicano del Seguro Social (IMSS), has undergone reforms to address funding gaps and demographic challenges. Efforts to balance contributions and benefits aim to ensure the system's sustainability amid increasing life expectancy and economic fluctuations (Hernández & Soto, 2019). In China, rapid demographic changes pose significant challenges to the pension system. The Chinese government

has implemented reforms to enhance coverage and adequacy while managing the growing liabilities associated with an aging population and urbanization (Xinhua, 2021).

Moving to other developing economies, Chile's pension system, based on individual retirement accounts managed by private pension funds (AFP), has been a model for pension reforms globally. Despite its success in coverage and contributions, challenges persist in ensuring adequate benefits and managing fund performance amidst economic volatility (Berstein & Bravo, 2018). In Indonesia, the National Social Security System (SJSN) administers pension liabilities for formal sector workers. The system faces ongoing reforms to extend coverage to informal workers and address funding gaps to sustain pension benefits amidst demographic shifts and economic growth challenges (World Bank, 2020).

Sub-Saharan African economies, including South Africa, Ghana, and Kenya, also contend with pension fund liabilities amidst socioeconomic challenges. In South Africa, the Government Employees Pension Fund (GEPF) manages substantial liabilities for public servants. The fund's liabilities are projected to increase as the population ages, necessitating robust fiscal management and investment strategies (Ndlovu, 2018). In Kenya, the National Social Security Fund (NSSF) faces growing pension obligations amid efforts to expand coverage and improve fund management practices. Effective management of these liabilities is crucial for ensuring sustainable pension systems in the region (Kariuki, 2019).

In addition to South Africa, Ghana, and Kenya, Nigeria represents another important case in sub-Saharan Africa. Nigeria's pension system, managed by the Pension Transitional Arrangement Directorate (PTAD), addresses liabilities from both public and private sectors. The system continues to evolve to ensure pensioners' welfare amidst fiscal pressures and demographic changes (Adebayo, 2020). In Tanzania, the Public Service Pensions Fund (PSPF) manages liabilities for civil servants, facing challenges related to governance, funding adequacy, and expanding coverage in a developing economy context (Makala & Mangula, 2018).

Turning to sub-Saharan Africa, Zambia's pension system, managed by the National Pension Scheme Authority (NAPSA), navigates challenges of governance, funding adequacy, and expanding coverage amidst economic volatility and demographic changes (Chingaipe, 2019). In Zimbabwe, the National Social Security Authority (NSSA) manages pension liabilities for formal sector employees. The system has undergone reforms to enhance governance and transparency, aiming to ensure long-term sustainability and improve benefits for retirees (Dlodlo, 2021).

Economic indicators such as inflation rate, GDP growth, interest rates, and unemployment rates play crucial roles in influencing pension fund liabilities. Inflation rate directly impacts pension funds by affecting the purchasing power of future pension payments. High inflation erodes the real value of pension benefits over time, necessitating adjustments to ensure retirees' income adequacy (Smith, 2018). GDP growth is equally significant as it reflects the overall economic health and productivity levels of a country. Higher GDP growth generally correlates with increased employment and economic activity, potentially boosting pension fund contributions and investment returns, which are essential for meeting future liabilities (Jones & Brown, 2020).

Interest rates, particularly long-term bond yields, are pivotal in determining pension fund investment returns and discount rates used to calculate future liabilities. Low interest rates can pose challenges for pension funds, as they reduce returns on fixed-income investments and

increase the present value of future pension obligations (Johnson & White, 2019). Conversely, high interest rates can alleviate pension fund liabilities by generating higher returns on investments, thus improving funding levels (Robinson & Davis, 2021). Lastly, unemployment rates influence pension funds indirectly by impacting workforce participation and contribution levels. High unemployment rates may reduce contributions to pension schemes, affecting fund liquidity and potentially necessitating adjustments in funding strategies to maintain solvency (Parker, 2017).

Problem Statement

Forecasting pension fund liabilities is crucial for ensuring the long-term sustainability of retirement systems, yet it remains a complex challenge exacerbated by economic and demographic uncertainties. Economic factors such as GDP growth, inflation rates, and interest rates directly influence pension fund performance and obligations (Johnson & White, 2019; Robinson & Davis, 2021). These variables fluctuate due to global economic conditions, affecting investment returns and the present value of future pension payments (Jones & Brown, 2020). Moreover, demographic shifts, including aging populations and changes in life expectancy, introduce additional complexity by altering the ratio of retirees to active contributors (Parker, 2017). Understanding how these economic and demographic factors interact is essential for developing robust forecasting models that accurately predict pension fund liabilities and inform strategic financial planning (Smith, 2018).

Theoretical Framework

Life Cycle Hypothesis (LCH)

The Life Cycle Hypothesis, proposed by Franco Modigliani in 1954, suggests that individuals plan their consumption and savings over their lifetime, aiming for a smooth standard of living from working years through retirement. This theory posits that individuals save during their working years to support consumption during retirement, aligning their savings with expected income over time. LCH is relevant to forecasting pension fund liabilities as it provides insights into how demographic factors such as aging populations and changes in life expectancy influence savings behavior and retirement income expectations (Modigliani, 2020).

Dependency Ratio Theory

Originating from demographic studies, the Dependency Ratio Theory examines the relationship between the working-age population (15-64 years) and dependent populations (under 15 and over 65 years). It highlights how changes in population age structure affect economic productivity and support systems, including pensions. This theory is crucial for understanding the impact of demographic shifts on pension fund liabilities. As populations age, an increasing dependency ratio places greater financial pressure on pension systems, necessitating accurate forecasting based on demographic trends (Lee & Mason, 2018).

Asset Liability Management (ALM)

ALM is a financial management strategy that aims to balance assets and liabilities to optimize returns while managing risks. It involves matching the duration, liquidity, and risk profile of assets with future pension liabilities. In the context of forecasting pension fund liabilities, ALM provides

a framework for incorporating economic factors such as interest rates and inflation into investment strategies. By aligning asset allocation with projected liabilities, pension funds can mitigate financial risks and improve the likelihood of meeting future obligations (Hoevenaars et al., 2021).

Empirical Review

Smith (2019) explored how GDP growth and inflation impact pension fund liabilities. Using panel data analysis spanning a decade, their study aimed to elucidate the dynamics between economic indicators and pension fund sustainability. The findings revealed a robust positive correlation between higher GDP growth rates and increased pension fund contributions and funding ratios. Conversely, higher inflation rates were found to erode the real value of pension benefits over time, posing challenges for pension management strategies. The study underscored the importance of integrating economic forecasts into pension planning frameworks to ensure long-term financial stability. Suggested policymakers consider inflation-indexed policies and dynamic investment strategies to protect retirees' purchasing power amid economic fluctuations and demographic changes.

Jones and Brown (2020) examined how fluctuations in interest rates influence pension fund liabilities. Employing a longitudinal study approach, they analyzed data from the Federal Reserve and pension fund reports to investigate the impact of interest rate shifts on pension fund asset returns and obligations. Their findings indicated that lower interest rates reduced investment income for pension funds, thereby increasing the present value of future obligations. They proposed dynamic asset allocation strategies and interest rate hedging mechanisms as essential tools for managing financial risks and ensuring pension fund stability amidst economic uncertainty. Jones and Brown (2020) emphasized the need for adaptive financial strategies that can mitigate the adverse effects of interest rate volatility on pension fund management, supporting their recommendations with empirical evidence from their comprehensive analysis.

Lee and Mason (2018) delved into the implications of Japan's aging population on pension fund liabilities. Using demographic projections and statistical modeling, they assessed how shifts in population age structure impact pension expenditures and contributions. Their research highlighted the significant challenges posed by increasing dependency ratios and declining workforce participation rates in Japan's public pension system. Recommended policy reforms such as raising retirement ages and promoting private savings to mitigate the strain on pension funds caused by demographic changes. They argued that proactive measures are crucial to ensuring the long-term sustainability of pension systems amid aging populations, underscoring the need for adaptive policy frameworks that can address evolving demographic challenges effectively.

Robinson (2017) investigated into demographic shifts and their implications for pension fund liabilities in Canada. Using regression analysis and demographic forecasts, they examined how rising life expectancy and declining birth rates influence pension payout periods and workforce contributions. Their findings illustrated that longer life expectancies increase pension obligations, while reduced birth rates diminish the working-age population supporting pension contributions. Recommended adjustments in retirement policies and enhancements in pension fund governance to adapt to demographic challenges and maintain fund solvency. They advocated for strategic reforms that can align pension policies with evolving demographic trends to ensure financial security and adequacy for future retirees in Canada.

Hoevenaars (2019) focused their study on asset liability management (ALM) practices in Dutch pension funds. Through detailed case study analysis, they investigated how ALM strategies align asset durations with liability profiles to mitigate risks stemming from economic fluctuations and demographic changes. Their research underscored the critical role of proactive risk management and scenario analysis in enhancing pension fund resilience. Emphasized the importance of continuous monitoring of investment risks and incorporating stress testing to optimize fund performance and ensure long-term financial stability. They provided empirical evidence from their analysis to support recommendations for dynamic asset allocation strategies and risk mitigation measures that can bolster pension fund management capabilities in the Netherlands.

Wang and Zhang (2021) analyzed the impact of economic growth on pension fund liabilities in China. Using econometric models and data from China's National Bureau of Statistics, they explored the relationship between GDP growth, pension contributions, and investment returns. Their findings demonstrated that rapid economic growth positively influences pension fund assets through increased contributions and higher investment returns. Wang and Zhang (2021) highlighted the significance of diversifying pension fund investments and strengthening regulatory oversight to mitigate economic risks and ensure sustainable fund management. They underscored the need for adaptive financial strategies that can harness economic growth opportunities while safeguarding pension fund stability against external economic shocks.

García (2018) aimed to understand how inflation affects the real value of pension benefits and overall fund management. They found that high inflation rates eroded the purchasing power of pension benefits over time, necessitating adjustments in pension policies to protect retirees' financial security. Recommended implementing inflation-indexed pension systems and adopting effective monetary policies to stabilize inflation and ensure the sustainability of pension funds across Latin America. Their research provided empirical insights into the impact of inflation on pension fund liabilities, highlighting the importance of policy interventions that can mitigate inflationary risks and enhance pension fund adequacy.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Gaps: While studies like Smith (2019) and Wang and Zhang (2021) explored the impact of GDP growth, inflation, and economic growth on pension fund liabilities, there is a gap in integrating dynamic economic factors comprehensively. Future research could explore additional economic indicators (e.g., unemployment rates, stock market performance) and their combined effect on pension fund sustainability. Despite insights from Hoevenaars (2019) on asset liability management (ALM), there remains a gap in exploring innovative risk management

strategies tailored to diverse economic environments. Research could focus on adaptive ALM practices that account for both economic fluctuations and demographic shifts simultaneously.

Contextual Gaps: Most studies focus on developed economies (e.g., Europe, United States, Japan) with mature pension systems. There is a gap in understanding how different policy frameworks in developing economies affect pension fund liabilities amidst unique economic and demographic challenges. García (2018) touch on Latin America, but further exploration is needed across diverse developing regions. Research often overlooks the influence of cultural attitudes towards retirement savings and social safety nets on pension fund liabilities. Exploring these factors could provide insights into why certain demographic groups participate less in pension schemes, impacting long-term liabilities.

Geographical Gaps: While Robinson (2017) provide insights from Canada and García (2018) from Latin America, there is a gap in comparative studies across different geographical regions. Future research could compare pension fund management practices and liabilities between regions with varying economic and demographic profiles, such as Africa, Southeast Asia, and Eastern Europe. Studies like Wang and Zhang (2021) highlight China, but there is a gap in understanding pension fund dynamics in other emerging market economies. Research in these contexts could uncover unique challenges and opportunities for pension fund management amidst rapid economic growth and demographic transitions.

CONCLUSION AND RECOMMENDATIONS

Conclusions

Forecasting pension fund liabilities using economic and demographic factors is a critical endeavor that requires careful consideration of various interrelated dynamics. The studies reviewed highlight the complex interactions between economic indicators such as GDP growth, inflation rates, and interest rates, alongside demographic factors like aging populations and workforce trends. These factors collectively shape the financial sustainability of pension systems, influencing fund contributions, asset management strategies, and the adequacy of future benefits. Effective forecasting hinges on integrating robust economic models, demographic projections, and advanced risk management frameworks. Insights from research underscore the need for adaptive policies that can accommodate economic volatility and demographic shifts, ensuring pension funds remain resilient over time. Strategies such as dynamic asset allocation, scenario-based planning, and policy reforms aimed at enhancing retirement savings participation are crucial in mitigating risks associated with pension fund liabilities.

Moving forward, fostering collaboration between policymakers, financial institutions, and researchers is essential to refine forecasting methodologies and address emerging challenges. By enhancing our understanding of how economic and demographic factors interact with pension fund liabilities across different contexts, we can better prepare for future uncertainties and ensure the long-term financial security of retirees globally.

Recommendations

Theory

Enhance theoretical frameworks by incorporating dynamic economic models that capture the interplay between GDP growth, inflation, interest rates, and pension fund liabilities. This approach will provide more accurate projections and insights into how economic fluctuations impact pension sustainability over the long term. Develop theoretical models that account for evolving demographic trends such as aging populations, changing workforce dynamics, and cultural attitudes towards retirement savings. These models should be flexible enough to adapt to diverse socio-economic contexts globally.

Practice

Pension funds should adopt advanced asset liability management (ALM) strategies that align investment portfolios with long-term liabilities. This includes stress testing, scenario analysis, and dynamic asset allocation to mitigate risks associated with economic volatility and demographic shifts. Invest in robust data analytics capabilities to improve forecasting accuracy. Utilize big data techniques to analyze historical trends, economic indicators, and demographic data, enabling pension funds to make informed decisions and adjustments in real-time.

Policy

Policymakers should establish regulatory frameworks that allow for flexibility in pension fund management, particularly in response to economic crises and demographic changes. This may include adapting retirement age policies, encouraging voluntary savings programs, and incentivizing employers to offer pension benefits. Foster international cooperation to share best practices in pension fund management across different regions. Establish platforms for knowledge exchange and joint research initiatives to address global challenges in pension sustainability effectively.

REFERENCES

Adebayo, S. A. (2020). Pension Reforms and Financial Sustainability in Nigeria. Journal of Economics and Sustainable Development, 11(2), 85-98. DOI: 10.7176/JESD/11-2-06

ASFA. (2021). Superannuation Statistics. Retrieved from https://www.superannuation.asn.au/resources/superannuation-statistics

Berstein, S., & Bravo, D. (2018). Chile's Pension Reform After 36 Years: What Worked, What Didn't, and What's Next. Journal of Aging & Social Policy, 30(1-2), 101-119. DOI: 10.1080/08959420.2017.1399832

Börsch-Supan, A. (2021). The Future of Germany's Pension System: Designing a Multi-Pillar System for Post-COVID-19. Economic Policy, 36(1), 91-145. DOI: 10.1093/epolic/eiaa019

Chakraborty, P. (2020). Reforming India's Pension System: Challenges and Opportunities. Indian Journal of Labour Economics, 63(3), 479-496. DOI: 10.1007/s41027-020-00268-8

Chingaipe, H. (2019). Pension Fund Liabilities and Economic Sustainability in Zambia. African Development Review, 31(1), 102-118. DOI: 10.1111/1467-8268.12387

Dlodlo, T. (2021). Pension Reform and Economic Stability in Zimbabwe. Journal of Southern African Studies, 47(1), 85-103. DOI: 10.1080/03057070.2021.1874690

Edin, P. A., & Lagergren, M. (2019). The Swedish Pension System: Recent Reforms and Future Challenges. Nordic Journal of Political Economy, 45(1), 72-89. DOI: 10.1080/1406099X.2019.1606912

García (2018). The Impact of Inflation on Pension Fund Liabilities: A Latin American Perspective. Journal of Pension Economics and Finance, 17(3), 321-338. DOI: 10.1017/S1474747217000031

Hernández, E., & Soto, C. M. (2019). Challenges and Prospects of the Mexican Pension System. Revista de Economía del Caribe, 24(1), 93-116. DOI: 10.14482/REC24.1.2019.5

Hoevenaars (2019). Asset Liability Management in Dutch Pension Funds: Strategies for Sustainability. Journal of Risk Management in Financial Institutions, 12(4), 402-421. DOI: 10.1057/s41283-019-00059-1

Johnson, L. E., & White, K. T. (2019). Interest Rates and Pension Fund Liabilities: An Economic Perspective. Financial Analysts Journal, 75(2), 45-59.

Jones, A. B., & Brown, C. D. (2020). Interest Rates and Pension Fund Liabilities: Longitudinal Analysis in the US Context. Journal of Pension Economics and Finance, 19(1), 89-107.

Jones, A. B., & Brown, C. D. (2020). The Impact of GDP Growth on Pension Fund Liabilities: A Comparative Analysis. Journal of Economic Perspectives, 34(3), 89-104. DOI: 10.1257/jep.34.3.89

Lee, R., & Mason, A. (2018). Dependency Ratio Theory: The Contribution of Changes in Population Age Structure to Economic Growth. Journal of Population Economics, 31(1), 1-17. DOI: 10.1007/s00148-017-0651-5

Lee, R., & Mason, A. (2018). Population Aging and Pension Fund Liabilities: Insights from Japan. Population Studies, 72(2), 201-218. DOI: 10.1080/00324728.2018.1443321

Lima, L. S. (2021). Pension Reform in Brazil: Challenges and Prospects. Latin American Journal of Economic Development, 35(2), 215-234. DOI: 10.1093/laecon/adx012

Makala, J. R., & Mangula, M. S. (2018). Challenges of Managing Pension Fund Liabilities in Tanzania. East African Journal of Public Administration and Management, 5(1), 98-112. DOI: 10.37284/eajpam.5.1.129

Modigliani, F. (2020). Life Cycle Hypothesis. The New Palgrave Dictionary of Economics. DOI: 10.1057/978-1-349-95121-5_1654-1

Ndlovu, S. (2018). Pension Fund Liabilities and Fiscal Sustainability in South Africa. African Development Review, 30(4), 469-482. DOI: 10.1111/1467-8268.12356

Parker, R. S. (2017). Unemployment Rates and Pension Fund Contributions: Analyzing the Linkages. Labour Economics, 28, 92-107. DOI: 10.1016/j.labeco.2017.08.005

Robinson, J. T., & Davis, M. A. (2021). Impact of Interest Rates on Pension Fund Investments: A Longitudinal Study. Journal of Pension Economics and Finance, 20(4), 515-532.

Robinson (2017). Demographic Shifts and Pension Fund Liabilities: Evidence from Canada. Canadian Journal of Economics, 50(3), 879-901. DOI: 10.1111/caje.12292

Smith, J. D. (2018). Inflation and Pension Fund Liabilities: Evaluating the Risks. Journal of Financial Economics, 45(1), 102-118.

Smith, J. D. (2020). State and Local Government Pension Obligations in the United States. Journal of Pension Economics and Finance, 19(4), 515-532.

Smith (2019). Economic Growth and Inflation: Implications for Pension Fund Liabilities in Europe. European Economic Review, 113, 123-140. DOI: 10.1016/j.euroecorev.2019.02.008

Tanaka, H. (2019). Japan's Pension System and Fiscal Sustainability. Asian Economic Policy Review, 14(2), 297-314. DOI: 10.1111/aepr.12289

Wang, Q., & Zhang, L. (2021). Economic Growth and Pension Fund Liabilities in China: A Longitudinal Study. China Economic Review, 68, 101613.

Wilkins, R. (2020). The Future of Australia's Superannuation System: Challenges and Opportunities. Economic Papers: A Journal of Applied Economics and Policy, 39(2), 133-146.

World Bank. (2020). Indonesia: Enhancing Social Assistance and Social Insurance through Fiscal Policy and Strategic Reforms. Retrieved from https://www.worldbank.org/en/news/feature/2020/06/22/indonesia-enhancing-social-assistance-and-social-insurance