Does Pre-Retirement Financial Literacy Matter to Age 60's? Evidence from Ghana

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Abstract

It is essential for everyone to engage in effective retirement planning. Unfortunately, many people face financial difficulties after retirement due to inadequate financial literacy before, during, and after reaching the age of 60. This study empirically investigates the association between financial literacy and retirement planning and public pension management. Using a multivariate regression model on sample data collected from respondents in Ghana, this study shows that financial literacy matters in retirement planning and is positively associated with public pension management. In a developing country like Ghana, with high levels of financial illiteracy among older adults, we find evidence to show that most respondents have prepared for "basic" retirement. Evidence also shows that financial literacy is important for understanding governance, accountability, and transparency in public pension management. For policy purposes, we outline a host of policy recommendations that can enhance retirement planning and financial literacy and cure retirement financial distress.

Key words: Retirement Planning, Public Pension, Financial Literacy.

Introduction

The desire to have a good life after working years is an ambition that many individuals may not achieve because of poor retirement plans, non-performing retirement portfolios, insufficient pension benefits (mainly from public pensions), and financial illiteracy. Financial literacy is a latent yet potent force that influences how individuals manage their finances and plan for their retirement through the selection of financial and non-financial investment portfolios and their choice of pension fund managers. In 1994, the World Bank proposed a Multi-pillar Pension System in a famous report titled 'Averting the Old Age Crisis.'

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The three pillars of this proposal are basic pension, mandatory contributions to an earnings-related scheme, and voluntary saving. Based on this proposal, many countries rolled out pension reforms to provide improved benefits to pension contributors. These reforms have occurred in several ways. In some cases, governments have reduced their benevolence and placed greater responsibility on individuals to build and manage pension funds by encouraging private pension use to augment public pension schemes. Indeed, surmounting the challenge of building a sustainable retirement plan in a world where financial markets and products are becoming increasingly complex is a significant task for many. The financial market is becoming increasingly complex because of competition, technological improvements, and integration of global financial markets. In the Scientific mapping and bibliometric analysis of financial literacy, which covers the years 2001 to 2021, Suri and Jindal (2022) mentioned that there are four dominant research areas: demographic studies, economics, welfare, and behavioral themes. The authors suggest that literature in many of these areas is influenced by evidence from developed countries; hence, there exists a huge scope for empirical work from middle, low-middle, and low-income countries.

The terms financial education and financial literacy are used interchangeably. According to the Organization for Economic Cooperation and Development (OECD) (2005), financial education is the process by which financial consumers or investors improve their understanding of financial products and concepts. Through information, instruction, and/or objective advice, they develop skills and confidence to become more aware of financial risks and opportunities to make informed choices, know where to go for help, and take other effective actions to improve their financial well-being. Financial literacy, on the other hand, is a combination of awareness, knowledge, skills, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being (OECD/INFE 2011:3). Empirically, Klapper et al. (2015), in the S&P Global Financial Literacy Survey, revealed that many countries in Africa and South Asia have adult populations with low financial literacy. The survey also inferred that 68 percent of the adults in Ghana were financially illiterate. This high rate of adult financial illiteracy is alarming and requires urgent attention through research and policy interventions, considering the pension reforms that have occurred in Ghana. Holzmann, Hinzand, and Dorfman (2008) conceptualized pension systems and reforms to compose of (i) a non-contributory "zero pillar"; (ii) an appropriately sized mandatory "first pillar"; (iii) a funded mandatory defined contribution "second pillar; (iv) a funded voluntary "third-pillar"; and (v) a nonfinancial "fourth pillar" fourth pillar'. The core objective of this pension system is to provide protection against the risk of poverty in old age and smooth consumption from work life to retirement.

While financial assets are easily recognized as a major means of building a retirement portfolio, many lack the financial knowledge and skills of personal financial management, leading to inadequate retirement planning. Many employees put so much hope on public pensions to provide the anticipated and needed financial cushion during retirement, which in many instances tends to be woefully inadequate. The main problem is that many contributors to public pensions assess the

performance of these funds based on the current retirement income enjoyed by retirees and their anticipated retirement income. Many of these contributors themselves lack the basic knowledge of financial literacy, a situation very common in both developed (Lusardi and Mitchell, 2007a, 2007b, 2009; Hastings and Tejeda-Ashton, 2008) and developing countries (Klapper, Lusardi, & Van Oudheusden, 2015). Similarly, Amoah (2019) notes that financial education helps reduce the probability of investors falling prey to fraudulent investment schemes, such as Ponzi and pyramid schemes. The key research questions are as follows: How do these contributors to public pensions assess the management of their pensions in an environment where there is evidence that basic financial literacy is woefully inadequate? To what extent is financial literacy related to pension contributors' assessment of public pension fund management? These two issues set the tone for this study as we investigate the nexus between pre-retirement financial literacy and public pension management.

Financial security during retirement is a major global concern, especially in developing nations with low financial literacy. In Ghana, inadequate financial literacy hampers effective retirement planning, leaving many older adults unprepared for their post-retirement financial needs. Additionally, a limited understanding of public pension systems reduces individuals' ability to hold institutions accountable, ensure transparent governance, and optimize financial outcomes. This study addresses the prevalent retirement financial distress that affects the financial well-being of older adults and their dependents. This calls for an empirical investigation into the relationship between financial literacy, retirement planning, and public pension management in Ghana. The objectives of this study are threefold: first, to assess the preparedness of respondents for retirement; second, to determine how financial literacy is associated with retirement planning and public pension fund management in Ghana; and third, to analyze how financial literacy affects respondents' views on public pension management in Ghana.

This study addresses the issue of retirement financial insecurity among older adults in developing nations such as Ghana. Inadequate financial literacy and systemic challenges in the public pension administration have worsened this problem. Improving financial literacy can enable individuals to make informed retirement decisions, advocate better pension governance, and achieve financial security. This research offers actionable insights for policymakers, educators, and financial institutions concerning Ghana's aging population and the crucial role of public pensions in supporting retirees.

This study enriches the literature on financial literacy and retirement planning by empirically demonstrating a link between financial literacy and retirement planning in Ghana. Using a robust multivariate regression model on the sample data, we show how financial literacy impacts individuals' retirement planning capabilities. This study highlights the importance of financial literacy in understanding and engaging public pension fund management. The findings show that financial literacy aids individuals' financial decisions and plays a vital role in improving governance, accountability, and transparency in public pension management. We offer policy recommendations to improve the financial

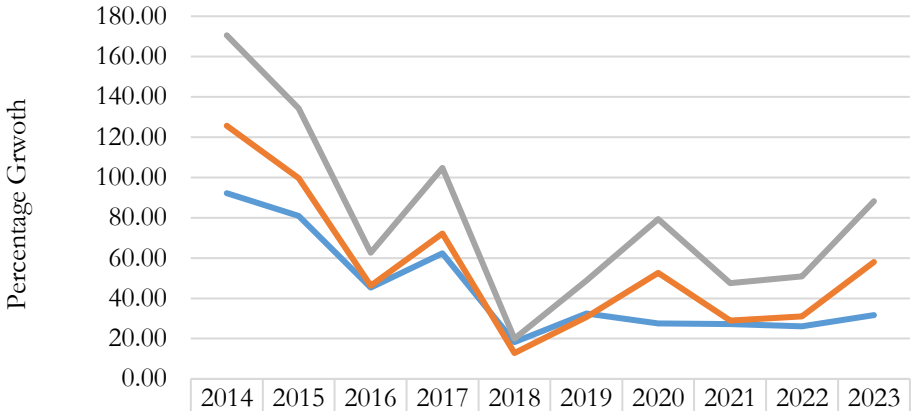
literacy and retirement planning of older adults. This includes financial education programs, integrating retirement planning into community initiatives, and increasing public awareness of pension systems, especially by the National Pension Regulatory Authority (NPRA), managers of private and public pension funds, and promoters of financial literacy and inclusion.

For Ghana, the National Pensions Act, 2008 (Act 766), demands that every Ghanaian worker receives retirement benefits as and when due. The objectives of Act 766 (2008) are to provide pension benefits, ensure retirement income security for workers, ensure that every worker receives retirement benefits, and establish a uniform set of rules and standards for the administration, payment of retirement, and related benefits for workers. The Act created a formal public pension and private pension fund industry. Furthermore, the National Pensions Act of 2008 (Act 766) mandated the establishment of a new contributory Three-Tier Pension Scheme with the National Pensions Regulatory Authority (NPRA) to oversee the efficient administration of the composite pension scheme. In all, Act 766 mandates an 18.5 percent contribution towards an employee's pension and a maximum tax allowable pension contribution of 35 percent.

The first tier (Tier I) is public pension, which is the Basic National Social Security Scheme for all workers in Ghana. It is a defined benefit scheme and mandatory for workers to have 13.5% of employers' contributions, of which 11 percent are managed by the Social Security and National Insurance Trust (SSNIT) and the remaining 2.5 percent is paid to the public National Health Insurance Scheme. The second tier (Tier II) is a defined contribution occupational pension scheme mandatory for workers, with a 5 percent contribution from the employees. The 16.5 percent tax allowable maximum contribution is the third-tier (Tier III) voluntary scheme, which includes all Provident Funds and all other Pension Funds, aside from Tiers I and II.

Data from the National Pension Regulatory Authority (NPRA) shows that growth opportunities exist in the private pension fund industry (Figure 1), with a higher growth in the asset size of the private pension industry compared to the public pension fund. This result can be partially attributed to the 10-year mandatory lock-in fund period. Furthermore, the trend that shows a high rate of 92.18 in 2014 compared to 31.62 percent in 2023 points to the growth opportunities that exist in the private pension industry.

Figure 1: Growth of Pension Funds in Ghana



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total Pension	44.89	34.70	16.31	32.60	7.13	18.24	26.68	18.56	19.90	30.27
Public Pension	33.47	18.62	0.89	9.93	-5.41	(1.77	25.02	1.71	4.87	26.34
Private Pension	92.18	80.98	45.39	62.27	18.26	32.43	27.56	27.25	26.09	31.62

Authors' Construct with data from the NPRA Annual Report various editions.

What is more striking is that in 2018, public pension assets declined by 5.41 percent, while private pension fund assets experienced an 18.26 percent growth. Additionally, the growth in the two respective industries appears to converge over time. This trend demands more effort from pension fund managers to increase their asset sizes by enrolling more contributors in their schemes. As Iglesias and Palacios (2000) posit, many public pensions are mismanaged, which deprives contributors of a good return on their investment during their non-working years. This unfortunate situation in the management of public pensions places an extra burden on pension contributors to pursue retirement plans to augment the benefits that they may tap from public pensions. From 2019 to 2023, this trend has reversed, although 2021 reported a dip in the percentage growth in pension fund assets.

We argue that financial literacy matters in pursuit of personal retirement plans. As Kim et al. (2005) note, individuals who have advanced economic knowledge are more likely to prepare for retirement than those who are financially less literate. In Almenberg and Save-Soderbergh (2011), financial literacy influences retirement plans for those who plan to retire compared to those who do not. What is also worrying is that, in many countries, pension knowledge is limited, and many individuals find pension information and communication too complex to comprehend (Prast & van Soest, 2016). The resources that one may set aside for a personal retirement plan are also largely influenced by the expected performance of public pension funds, being mindful that in many instances, public pension benefits are inadequate. In Africa and Ghana, in particular, Kumado and Gockel (2003) cautioned that external family support in

retirement and old age is declining since modern-day families in Ghana are heavily nuclear in nature; hence, pension funds would play a crucial role in the survival of old age. Public information on public pensions in Ghana, the Social Security and National Insurance Trust (SSNIT), spends approximately 1 percent of the Gross Domestic Product on providing pensions for approximately 0.4 percent of the Ghanaian population. The rest of the paper is structured as follows: Section 2 presents the theoretical and empirical literature, Section 3 details the data collection method, Section 4 presents the results and discussion, and Section 5 presents the conclusions and recommendations.

Literature Review

Increasingly competitive and complex financial markets present financial market participants with challenging decision-making processes. Therefore, an individual's ability to make financial decisions with the expectation of the best outcome depends on many factors, of which financial literacy plays a major role. This decision-making process is enveloped in behavioral economics and finance literature on individual financial investment decisions. From a conventional economic perspective, individuals are rational and seek to pursue decisions that maximize their utility. Altman (2008) doubts that the interplay between financial literacy and education does not result in rational individual behavior, as predicted.

According to Altman (2012), three different approaches exist for individual financial decision making. The first approach in explaining financial decision-making is conventional economic theory, which posits that education and training, also known as human capital formation, are key to improving productivity. In this theory, an individual's financial decision is assumed to be optimal unless there is interference from the government in the market and decision-making. The second approach is behavioral economics: Kahneman-Tversky, the errors and biases approach, which suggests that education can sometimes improve decision-making. This also includes the view that government intervention in decision making is often considered the best practice route to make ideal choices. In the behavioral economics setting, financial decision making is biased and error-prone, without government intervention in choice behavior. The third is behavioral economics: the Simon bounded rationality-rational individuals' approach, which holds that education can have important effects on decision-making, and the role of the government is to establish the correct institutional environment and provide the education required for ideal choices to be executed. In this context, the government intervenes in the financial market to protect only its participants. Financial decision making can be improved through high-quality decision-making environments and improvements in financial education.

With financial literacy, Bandura's (1997) self-efficacy theory comes to the fore because an individual's ability to stay committed to a decision is based on the skills and knowledge that individuals possess in a particular matter of interest. In situations of personal interest, individuals who are more skilled, knowledgeable, and resilient are likely to make sound judgments in harsh conditions. The Existence, Relatedness and Growth (ERG) theory propounded by Alderfer and Guzzo (1979) can also be linked to financial literacy. The main contention of this theory is that when existence or basic needs (as brought forth by Maslow) are satisfied, an individual can

focus on other higher needs. For instance, once an individual satisfies their basic needs, such as food, clothes, and shelter, the rest can be either saved or invested to achieve favorable returns. In other words, individuals with more money at their disposal are more likely to invest in the future than those with less money. The relatedness aspect of the theory captures an individual's ties with family members. For instance, do individuals depend on which they expend? This may affect disposable income or the money left to invest. Again, the growth aspect of the theory captures the personal development of the individual, such as the funds invested in education, obtaining certain life skills, and any other career-oriented program, with the sole aim of adding value to the individual. This can also affect disposable income and, to some extent, the ability to invest and save in the future. Clearly, for this study, financial education plays an important role for individuals and households in maximizing their economic well-being during their lifetime and, most importantly, during their retirement.

Two theories in the literature on saving for retirement are the life-cycle hypothesis (LCH) and permanent income hypothesis (PIH). Generally, the main reason for pension funds is to provide adequate funds to contributors during the non-working years of their lives. Therefore, a good pension protects contributors against poverty and attempts to provide decent income over their life cycle. The LCH, accredited by Modigliani (1966), explains the consumption patterns of individuals during their lifetime. The LCH suggests that individuals plan their consumption and savings behaviors over their lifecycle. Friedman's (1957) PIH theory holds that consumption is a function of permanent income, and thus, saving is a residual. According to the PIH, individuals average their income in the long term, with little change in consumption over this period. In general, these theories explain that individuals save funds during their active working years to cover their living expenses during retirement. The extent to which they save for retirement depends on their lifestyle during their working years and anticipated lifestyle during retirement.

In anticipating how much to save during work life for retirement, Novy-Marx and Rauh (2011) remark that the available policy options in the cost-of-living matter in building funds for retirement. Empirically, these authors argue that adjustment by one percentage point or adjusting the retirement age by one year in Colorado and Minnesota exposes the taxpayer to bear a large share of the costs associated with the legacy liabilities of state-defined benefit pension plans. In terms of risk management through public pension funds, Halim et al. (2010) show that American corporate and public funds are more efficient in managing risk. These efficient funds have the lowest average number of staff dedicated to risk management, whereas Australia/New Zealand and Canada have the highest for each invested dollar. Ketkaew et al., (2020) reveal that in urban and rural China, the perceived retirement benefits, and financial attainment capacity among other factors are related to an individual's retirement behavior. Naruetharadhol et al, (2021) provide evidence that career status matters in an individual's preparedness for retirement just as age is also relevant in retirement.

Akoto et al., (2017), contribute to the empirical financial literacy in Ghana by revealing that cocoa farmers in the Assin Foso and Twifo Praso Districts of the

Central Region have a lower level of financial literacy. This study finds factors with a high probability of influencing financial literacy, including geographical location, age, and education level. According to Dovie (2018), an individual's usage of funds is a function of his/her financial literacy, and retirement preparation helps accumulate funds for life in old age. For Agbobli (2011), Kpessa (2011), and Dovie (2018b), pension income is the major source of income for retirees in Africa, particularly in Ghana. Ofori (2021) examined financial planning and retirement in Ghana. Using survey data from 900 respondents and a logit model, this study provides evidence to support variables such as age, income, and years of retirement as key drivers influencing retirement planning. While Ofori (2021) focuses on financial and retirement planning, our study focuses on financial literacy and its effects on retirement planning and public pension management.

Additionally, there is evidence in the work of Hastings and Tejeda-Ashton (2008) that individuals with low financial literacy, income, and education prefer to use relations, that is, recommendations from friends, co-workers, and employers, rather than fundamental cost considerations when deciding on which pension fund to choose. Similarly, Mata (2021) investigated the effects of financial literacy and gender on retirement planning among young Mexican adults. Huang, et al., (2024) employed the structural equation modeling analysis to show that both pension and financial literacy directly influenced the diversity of financial portfolios and financial well-being for adults in Chengdu, China. Adopting Ajzen's theory of planned behavior, the author developed an extended conceptual framework and estimated a generalized structural model using survey data on financial inclusion. The author found that most financially literate individuals have less intention to pursue passive strategies, whereas financial behavior and inclusion are associated with active planning. From this review, it is clear that, to a large extent, financial literacy influences the choice of retirement plans and pension funds. In assessing readiness for pension reforms, Oggero et al. (2023) employed an ad hoc module of SHARE data for Italy and reported that financially literate and pension-knowledgeable individuals are more willing to accept pension reforms. Ghadwan et al. (2023) employed a structural equation modelling technique to show that financial self-efficacy, retirement goal clarity, and government policy impact financial planning for retirement behavior among public university employees. Harvey and Urban (2023) recommend that there is no clear increase in account ownership, retirement investment, or homeownership after personal financial education coursework for 18-year-old Americans from the National Financial Capability Study (NFCS). The preferred route is personal finance coursework to have content, such as budgeting, long-term debt, and credit. Based on their research in rural China, Xu et al. (2023) argue that enhancing financial literacy could enhance rural households' involvement in pension plans. They also observe that, while financial literacy does not notably impact the adjustment in pension contributions, possessing a high level of financial literacy provides relative benefits in rural household pension decision-making.

This study hypothesizes that financial literacy is related to retirement plans. From the many stories of retirees who contribute to mandatory public pension schemes, their ability to evaluate these funds and their reliance on the expected benefits from

these funds have opened them up to disappointment. This is because the pension they receive from the public is woefully inadequate, and they have to fall on their retirement plans to augment their financial needs during retirement. (1) Is there any role of financial literacy in judging the management of public pension funds? (2) What are the lessons for the stakeholders in the pension ecosystem? This study uses data from sampled Ghanaians to answer these questions.

Method

Data

This study relies on quantitative and cross-sectional primary data. The data were sourced from a structured questionnaire administered to a representative sample of 600 respondents. The question type was a mixture of closed-ended (e.g., multiple choice and a seven-point Likert Scale) and open-ended survey questions. A multistage random sampling technique was applied to obtain respondents from districts of the Greater Accra Region, Ghana, from August 15, 2018, to October 16, 2018. The districts are Okaikwei, Ladadekotopon, Ayawaso East, Ga Central, Ga South, Ablekuma North, Kponekatamanso, Ashiaman, Ada East, Ningo Prampram, and Tema Metropolis.

To avoid ambiguity, we briefly explain how the three variables that capture public pension fund management were measured. For financial literacy, the study adopted the basic financial literacy question used by Van Rooij, Lusardi, and Alessie (2011). Thus, a tried and tested standard question is predominantly used with a unique addition. The question set tested respondents' numeracy ability, understanding of inflation, interest compounding, money illusion, and diversification. To differentiate our test scores from earlier works that adopted this set of questions, we added one question to test the respondents' ability to differentiate between savings and investments. There is often a weak understanding of the differences between the two concepts. In this study, savings is defined as regularly depositing funds into an account to meet daily and emergency needs, whereas investment is the commitment of funds for a stated period to meet a set objective. When investment is made properly, it should compensate for time, inflation, and risk. We categorized financial literacy scores as very poor, poor, fair, good, very good, and excellent.

Concerning retirement planning, we used constructs that measured the time allocated to thinking and planning for retirement and the component of respondents' educational courses that addressed investment and retirement planning. For public pension fund management, we used the Canadian Pension Reforms contained in the World Bank Report (2017), "The Evolution of the Canadian Pension Model…", which provides a standard to assess public pension management. The three areas of public pension fund management are governance of the pension scheme, accountability and transparency, and investment policies of the scheme. The three areas of public pension fund management are transformed into logarithmic forms and used in the model. We also used the respondents' demographic and behavioral characteristics as controls. We used a multivariable construct to measure the respondents' perceptions of public pension management in Ghana. These theoretically and empirically informed variables are modeled and estimated in subsequent sections.

Econometric Modelling

To investigate the role of financial literacy in determining retirement planning and public pension management, we used a simple linear matrix of the form:

$\boldsymbol{y = X\beta + \varepsilon}$ … (1)

Where y is an $\boldsymbol{n \times 1}$ vector of observations representing the dependent variable(s), **X** is an $\boldsymbol{n \times k}$ vector with $\boldsymbol{k}$ covariates, $\boldsymbol{\beta}$ is a $\boldsymbol{k \times 1}$ vector that is unknown, and a stochastic error term ($\boldsymbol{\varepsilon}$) which is assumed under the classical linear regression to be normally distributed.

Equation 1 is re-specified as a multivariate model with multiple dependent variables. That is, we transform the standard linear regression in equation 1 into a multivariate regression form with more than one dependent variable (Refer to Afifi et al.,2004; Haase & Ellis 1987; Chatfield, 2018; Hidalgo and Goodman, 2013).

Following the formulation by Hidalgo and Goodman (2013), equation 1 is now presented as:

$$\boldsymbol{Y_{n\times 1} = X_{n\times(K+1)}\ \beta_{(K+1)x1} + \varepsilon_{nx1}} \cdots (2)$$

To present equation 2 in an estimable form we follow Bruin (2006),

$$\boldsymbol{Y_{n\times p} = \beta_0 + \beta_1 Finlit_1 + \beta_2 Controls_2 + \gamma_3 + \varepsilon \ldots (3)}$$

From equation 3, $\boldsymbol{Y_{n\times p}}$ which represents the multiple dependent variables include a measure of retirement planning in logs (lnRP), measure of government pension scheme in logs ($\boldsymbol{lnpp}$), a measure of accountability and transparency in logs ($\boldsymbol{lnacc}$), and a measure of the investment policy of the scheme in logs (ln*inv*). The variable of interest $\boldsymbol{Finlit}$ is financial literacy scores which is a categorical variable of the form very poor, poor, fair, good, very good, and excellent. A vector of control variables (controls) includes age, age^2, contributor to the public pension (SSNIT contribution), level of education completed, years to retirement, and take-home income. Given the heterogeneous nature of the districts and communities, their respective dummies were included as fixed effects ($\boldsymbol{\gamma}$). To simplify the results these 10 dummies are presented as YES, so the results do not look messy, more so as they add very little to the results. All other variables or parameters have been defined previously.

Diagnostics Tests

When analyzing cross-sectional data, the two main identification challenges commonly associated with such data are multicollinearity and heteroscedasticity. We investigated the presence or absence of multicollinearity by using a pairwise correlation test. The test results in Table 3 provide evidence that there are no high pairs of variables in the estimated models. The highest correlation coefficient of 0.494 exists between SNNIT contribution (SNNIT Cont) and employment status (Empl Status), which is intuitively expected. However, the invalidation of the model estimates was not severe. Furthermore, the variance inflation factor (VIF) in an ordinary least squares model was used as a robustness check.

A mean VIF value of 3.78, as reported in Table 4, indicates the absence of severe multicollinearity in the models. We controlled for possible heterogeneous effects using district- and community-level dummies. According to Amoah et al. (2018), this approach is an appropriate way to control unobserved heterogeneity. Using the F-statistics, which are statistically highly significant, we have evidence that, overall, the models have passed the fitness tests and will not produce spurious results. However, we deem it necessary to acknowledge that financial literacy is endogenous as a result of possible reverse causality with the

dependent variables or missing variable bias; hence, similar to Lusardi and Mitchel (2013), we interpret our results as an association rather than a causal impact, which is empirically acceptable. Finally, given the sensitive and confidential nature of financial issues to respondents, we recorded about 13 percent non-responses. Based on these diagnostics, we are confident that the estimates are valid and reliable.

Ethical considerations

This study obtained ethical clearance from the Center for Economics, Finance, and Inequality Studies (CEFIS) (clearance number 2018-E5421). By implication, the study does not have health, legal, moral, or cultural consequences; it is neither discriminatory nor does it pose any physical, emotional, or mental threat to any respondent. The questionnaire was used to elicit information-assured respondents regarding confidentiality. The authors have no personal interest in the research except academics; hence, we can posit that there are no potential conflicts of interest regarding this study. Additionally, the sources and data collection processes have been duly acknowledged and are readily available upon request. The study had no direct effect on the physical, psychological, mental, or emotional health of respondents. All the sources of information used in this study were referenced.

Analysis of Results

Table 1: Descriptive Statistics

Stats	lnRP	lnGov	lnAcc	lnInv	Finlit	Age	Age2	SNNIT Cont.	Educ	Empl Status	Yrs to Retire	Income (ln)
Mean	5.72	4.51	4.9	4.33	2.84	31.25	1062.91	0.56	0.77	0.785	30.66	7.47
Median	5.78	4.59	4.97	4.4	3	29	841	1	1	1	30	7.44
SD	0.45	0.46	0.44	0.51	1.28	9.3	701.58	0.5	0.42	0.411	13.12	1.12
Skewness	-1.7	-1.76	-1.56	-1.64	-0.11	1.27	2.08	-0.22	-1.26	-1.4	0.68	0.18
Kurtosis	8.76	9.91	8.12	8.49	2.27	4.58	8.64	1.05	2.59	2.93	4.86	3.06
Min	3.33	1.95	2.49	1.61	0	18	324	0	0	0	0	4.38
Max	6.68	5.2	5.8	5.95	5	73	5329	1	1	1	95	10.46
N	521	521	519	520	532	517	517	521	532	531	454	389

Note: Finding an anti-log of the values in logarithms, yields the actual values obtained from the field.

The descriptive statistics for all the variables used in the model are presented in Table 1. The four dependent variables, *lnPP, lnGov, lnAcc,* and *lnInv*, were observed to have approximately the same mean and median, with smaller standard deviations (SD). This provides evidence of near-normality in the distributions of the dependent variables. The dependent variables are transformed into logarithms to facilitate the interpretation of our results in terms of elasticity. With the variable of interest, *Finlit* is a categorical variable that ranges from a minimum value of zero (0) to a maximum value of five (5), showing six categories, as indicated earlier. Similarly, the mean is approximately the same as the median, suggesting that most respondents are ranked "good" in financial literacy. In support of this conclusion, we also found that about 77 percent of the respondents were educated, with 56 percent being

SNNIT contributors. This shows that in our sample, not all educated respondents had SNNIT contributions. Most respondents were youthful, with the youngest respondent at age 18 and the oldest at 73, reflecting a wider coverage in the sample selection. The mean income of respondents was Gh¢3,300.00 (ln=7.47) and a median of Gh¢1,700.00 (ln=7.44), with an abnormally high standard deviation. The distribution was observed to be skewed and not normal; hence, it was necessary to transform the values into their respective natural logarithm form to look near normal, as shown in Table 1.

Table 2: T-test for Base and Actual Preparedness for Retirement (Rp)

Statistics	**Base Rp**	**Reported Rp**
Mean	9	9.167293
Variance	0	6.617911
Observations	532	532
Hypothesized Mean Difference	0	
Degree of Freedom	531	
T-Statatistics	-1.49994	
P(T<=t) one-tail	0.067112	

From the data collected and analyzed using a t-test, we have evidence from Table 2 that there is a statistically significant difference between those who are indifferent regarding their preparation for retirement and those who are prepared. This difference lends credence to our study regarding the unveiling of key drivers of such behavioral differences. Consistent with this theory, we posit that financial literacy is a key driver of retirement preparedness. To avoid possible serial correlation issues among covariates, we first investigated the correlation properties and presented the results in Table 3. We report the highest and lowest correlation coefficients as 0.494 and 0.001, respectively. The negative coefficient in the correlation matrix indicates an increase in one variable associates with a decrease in the other variable. From the correlation coefficients (see Table 3) and mean VIF (see Table 4) results, we argue that multicollinearity was not severe in this study. By implication, we can proceed to estimate our econometric model using these covariates with less concern for serial correlation issues. In Table 3, the pairwise correlation matrix reveals that financial literacy scores, ranging from FinLit 1 (very poor) to *FinLit* 5 (very good), generally exhibit weak correlations with demographic and socioeconomic factors. The observed negative correlations between different *FinLit* levels (e.g., *FinLit 1 and FinLit 2: r = -0.221; FinLit 1 and FinLit 3: r = -0.250*) are expected, as these levels serve as mutually exclusive indicators of financial knowledge. Notably, there is no strong positive correlation between financial literacy and income, with correlations across all *FinLit* levels remaining near zero (e.g., *FinLit* 4: r = 0.063; *FinLit* 5: r = 0.001).

Table 3: Pairwise Correlation Matrix

Variables	FinLit 1	FinLit 2	FinLit 3	FinLit 4	FinLit 5	Age	SnnitCont	Empl Status	Edu	Yrs retire	Inc
FinLit 1	1										
FinLit 2	-0.221	1									
FinLit 3	-0.25	-0.337	1								
FinLit 4	-0.219	-0.294	-0.33	1							
FinLit 5	-0.136	-0.183	-0.21	-0.181	1						
Age	-0.136	-0.06	0.108	0.069	-0.026	1					
SNNIT Cont	-0.029	-0.009	-0.01	0.037	-0.005	0.42	1				
Empl Status	-0.078	-0.02	0.055	0.008	0.039	0.42	0.494*	1			
Edu	-0.071	-0.08	-0.02	0.117	0.082	0.03	0.046	-0.083	1		
Yrs retire	0.117	0.141	-0.05	-0.184	-0.018	-0.4	-0.292	-0.123	-0.2	1	
Inc	-0.145	0.035	0.033	0.063	0.001	0.08	0.019	0.027	0	-0.051	1

**Shows the highest correlation coefficient.*

Similarly, educational attainment is only modestly associated with higher financial literacy (e.g., *FinLit* 4 and education: r = 0.117; *FinLit* 5 and education: r = 0.082). Age and years of retirement also do not demonstrate significant or consistent patterns, indicating that neither age nor proximity to retirement serves as a reliable predictor of financial literacy. Additionally, variables such as SSNIT contributions and employment status do not exhibit meaningful correlations with financial literacy, underscoring the complexity and multifaceted nature of financial knowledge development. Overall, the results suggest that financial literacy is not strongly associated with any single demographic or economic factor within the dataset.

Table 4: Multivariate Regression Results

VARIABLES	(1) lnRP	(2) lnGov	(3) lnAcc	(4) lnInv
Financial Literacy				
(Base Category Finlit==Very Poor)				
Finlit==Poor	0.2918**	0.4179***	0.3006**	0.1665
	(0.136)	(0.145)	(0.140)	(0.164)
Finlit==Fair	0.3184**	0.4228***	0.3332**	0.2012
	(0.129)	(0.137)	(0.133)	(0.156)
Finlit==Good	0.2768**	0.4021***	0.3076**	0.0859
	(0.128)	(0.136)	(0.131)	(0.154)
Finlit==Very Good	0.3001**	0.4342***	0.3093**	0.1602
	(0.130)	(0.138)	(0.133)	(0.156)
Finlit==Excellent	0.3351**	0.3739**	0.3991***	0.2090
	(0.137)	(0.145)	(0.140)	(0.164)
Controls				
Age	0.0716***	0.0719***	0.0641***	0.0895***
	(0.018)	(0.020)	(0.019)	(0.022)
Age^2	-0.0009***	-0.0009***	-0.0007***	-0.0011***
	(0.000)	(0.000)	(0.000)	(0.000)
SSNIT Contribution Dummy	0.0765	0.0872*	0.0527	0.1131*
	(0.048)	(0.051)	(0.050)	(0.058)
Years to Retire	0.0038**	0.0038**	0.0040**	0.0039*
	(0.002)	(0.002)	(0.002)	(0.002)
Employment Dummy	-0.0293	-0.0715	-0.0350	-0.0019
	(0.077)	(0.082)	(0.079)	(0.093)
Education Dummy	0.0067	0.0369	-0.0182	0.0128
	(0.051)	(0.054)	(0.052)	(0.061)
Income (ln)	-0.0019	-0.0100	0.0000	0.0019
	(0.020)	(0.021)	(0.021)	(0.024)
Community dummies	*Yes*	*Yes*	*Yes*	*Yes*
Constant	4.0146***	2.7230***	3.2965***	2.4636***
	(0.354)	(0.376)	(0.364)	(0.426)
Turning Point in Years (app.)	75.00	75.00	92.00	82.00
Observations	532	532	532	532
R-squared	0.123	0.110	0.114	0.129
F-test	3.576***	3.163***	3.299***	3.788***
Mean VIF†	3.78	3.78	3.78	3.78
Parms	14	14	14	14
RMSE	0.3636	0.3859	0.3733	0.4375

Dep Variables: lnPP, lnGov, lnAcc, and lnInv. † denotes a test based on OLS model.
*Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.*

From Table 4, our variable of interest, financial literacy, is presented in categorical form. The categories take the lowest measure as very poor and the highest as excellent. For simplicity of interpretation, we use very poor as the reference category and find evidence that improvement in financial literacy is positively associated with retirement planning (model 1: *lnRP*), governance and accountability of public pension (model 2: lnAcc), and perception of good public pension management (model 3: lnGov) at a minimum significance level of 5 percent. Thus, respondents with higher levels of financial knowledge are more likely to be identified with retirement planning, governance and accountability of public pensions, and public pension management than respondents with very poor levels of financial knowledge. This suggests that knowledge of financial literacy is essential in making decisions on retirement planning, which is consistent with the literature (Lusardi and Mitchell, 2007a, 2007b; Almenberg and Save-Soderbergh, 2011; Niu and Zhou, 2018). However, the same cannot be said for investment management of public pensions (Model 4: InInv). This may be attributed to the fact that the investment portfolio for pension funds is a complex and specialized area that exceeds the basic financial literacy knowledge of our respondents. This evidence is similar to that of Prast and van Soest (2016), who reported that pensions are complex for most individuals to understand; hence, the association is insignificant.

In theory, age is considered an important variable in retirement and pension decisions. Against this background, we controlled for age and found that it was positively associated with retirement planning and a good understanding of public pension management. In addition, we tested for a possible turning point in age, and found an inverted U-shaped association between Age, Age squared, retirement planning, and public pension management. Plausibly, as contributors' ages increase, they accept whatever retirement package and public pension benefits are available near retirement. This inverted U-shaped relationship with "Age" might also imply that, as people age beyond a certain threshold (75 years), their appreciation of public pensions declines, mainly because they have passed the retirement age. The turning point at 75 years of age is consistent with Ghana's public pension benefit threshold for named beneficiaries in the case of dead retirees.
This finding of age as a determinant of retirement planning from sample respondents in Ghana is similar to the evidence provided by Naruetharadhol et al. (2021) regarding retirement readiness among skilled immigrants in Thailand. Furthermore, contributing to public pensions is relevant to assessing public pension management only in the case of retirement planning and fund governance.

The number of years to retire is positively associated with retirement planning and public pension management, implying that the fewer the number of years contributors have, the more they accept their retirement state and public pension management. In this study, the more time (in years) respondents have to retire, the more positive they are about public pension management, implying that when an individual is young, the pension is not an immediate concern. This evidence agrees with Bongini and Cucinelli (2019) that youth must be educated to understand pension and social security, and the need for them to start planning for retirement early in their career lives. For the elderly, this issue becomes important because the

more people advance in age, the more likely they are to be less charitable for the management of public pension funds. In this study, we found no statistically significant associations between education, employment, income level, and public pension management. Thus, respondents were found to emphasize drivers other than education, employment, and income. Overall, the community's dummy variable was not statistically significant, indicating that variations in communities do not account for the dependent variable. Therefore, while we acknowledge its inclusion with "Yes," we do not report the statistics for the sake of brevity in presentation.

Discussion of Findings

This study provides evidence of the association between financial literacy and management of public pension funds using data from Ghana. Given the paucity of studies on this subject, this study makes a case similar to that of Anderson et al. (2017) in that financial literacy is an important and strong determinant of retirement planning in the United States. In other words, a strong statistical association exists between financial literacy and retirement planning. This evidence contradicts the findings of a recent study by Tan and Singaravelloo (2020). These authors used data on sampled Malaysian government employees and failed to find evidence consistent with Anderson et al. (2017). They argue that there is no evidence of an association between financial literacy and retirement planning. This finding suggests that financial literacy was low. Therefore, it is not expected to be significantly associated with retirement planning in Malaysia. The recent global financial literacy ranking score for Malaysia is 66, while that for the United States is 14, suggesting that the latter is more financially literate. Thus, countries with higher financial literacy are more likely to have a positive association with retirement planning. Given that the present study focused on the Greater Accra Region, which has the highest literacy rate in Ghana, it is not surprising that our results corroborate those of Anderson et al. (2017) and contradict those of Tan and Singaravelloo (2020). Intuitively, it would not be out of place to argue that countries (i.e., developed or developing) should emphasize financial literacy if they seek to provide a safe economic haven for cohorts on retirement. This argument may resonate with countries such as Angola, Somalia, Afghanistan, Albania, and Yemen, which are the last five countries with worst financial literacy scores of 140 and above.

Furthermore, our study posits that the level of financial literacy is associated with contributors' understanding of public pension fund management in the areas of governance and accountability. However, the investment management function of pension funds demands specialized knowledge and skills beyond the basic financial literacy levels examined by our respondents. In our sample, financial literacy levels were not associated with the investment management policy for public pensions. This is likely because advanced financial investment and portfolio management knowledge and skills are required to evaluate pension fund investment portfolios. From our response, age matters up to a certain level in public pension contributors' appraisals of pension fund management. Beyond a certain age, retirement and the planning and management of pension funds have no significant associations.

Conclusion and Recommendation

This study investigates the role of financial literacy in determining retirement planning and public pension management in Ghana. There is evidence that most respondents planned to retire. In addition, financial literacy is critical in retirement planning and evaluating public pension fund management. Moreover, in the face of the government becoming less benevolent in pension support, this study recommends that workers start planning for retirement in the early working years. Policymakers, such as the Ministry of Finance, Ministry of Education, and the Ghana Education Service, as well as the National Council for Curriculum and Assessment, in particular, should consider making financial education a part of the academic curriculum at the pre-tertiary educational level. In doing so, an integrated curriculum is preferred so that students are not exposed to making money without developing their full potential. Financial education, as part of the academic curriculum, will provide the necessary personal financial management knowledge and skills that will aid students in their lifelong financial decisions and improve their personal and family well-being.

The Ghana Tertiary Education Council should consider recommending that financial literacy be part of each program at the tertiary level of education in Ghana, especially for non-business students. This is because young adults at various tertiary educational institutions need personal financial education to prepare themselves before engaging in the ever-changing complex financial market. Without proper personal financial education, these graduates will not be effective and efficient participants in the financial market. Financial service providers such as banks, insurance companies, pension funds, mutual funds, and real estate brokers, among others, should prioritize financial literacy in their social engagement with the public, as they stand to gain most if the citizenry is financially literate. Regulatory bodies such as the National Pension Regulatory Authority (NPRA), Securities and Exchange Commission Ghana (SEC), and Bank of Ghana (BoG) should support financial literacy programs, as it is important to support their public education function. These institutions in the case of the NPRA should also engage in public education and create awareness of retirement plans. The SEC and BoG should dedicate financial and non-financial resources for use in financial literacy campaigns, as the knowledge transferred and acquired from public educational programs will, in the long-term, support their public education mandates. These activities should be targeted at all, including the employed and the self-employed.

REFERENCES

Afifi, A., Clark, V. and May, S. (2004). Computer-Aided Multivariate Analysis. 4th ed. Boca Raton, FL: Chapman & Hall/CRC.

Akoto, G, O. Appiah, K, O. &Turkson, J. K. (2017). Financial literacy of cocoa farmers in Ghana, *Int. J. Accounting and Finance, Vol. 7,* No. 1*, pp11-27*

Almenberg, J., &Säve-Söderbergh, J. (2011). Financial literacy and retirement planning in Sweden. *Journal of Pension Economics & Finance*, *10*(4), 585-598.

Altman, M. (2008). Behavioral economics, economic theory and public policy. *Australasian Journal of Economics Education*, *5*(1 & 2), 1–55.

Altman, M. (2012). Implications of behavioural economics for financial literacy and public policy. The Journal of Socio-Economics 41 (2012) 677– 690

Anderson, A., Baker, F., & Robinson, D. T. (2017). Precautionary savings, retirement planning and misperceptions of financial literacy. *Journal of financial economics*, *126*(2), 383-398.

Amoah, A., Hughes, G., &Pomeyie, P. (2018). Environmental consciousness and choice of bulb for lighting in a developing country. *Energy, Sustainability and Society*, *8*(1), 17.

Amoah, B. (2018). Mr Ponzi with fraud scheme is knocking: Investors who may open. *Global Business Review*, *19*(5), 1115-1128.

Alderfer, C. P., & Guzzo, R. A. (1979). Life experiences and adults' enduring strength of desires in organizations. *Administrative Science Quarterly*, 347-361.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bongini, P., &Cucinelli, D. (2019). University students and retirement planning: never too early. *International Journal of Bank Marketing,*Vol. 37 No. 3, pp. 775-797

Bruin, J. 2006. newtest: command to compute new test. UCLA: Statistical Consulting Group. https://stats.oarc.ucla.edu/stata/ado/analysis/.

Chatfield, C. (2018). Introduction to multivariate analysis. Routledge.

Dovie D. A. (2018). Utilisation of digital literacy in retirement planning among Ghanaian formal and informal sector workers. *Interações: Sociedade e as NovasModernidades*, 34, 113-140.

Dovie, D. A. (2018). Financial literacy in an African society: An essential tool for retirement planning. *Contemporary Journal of African Studies*, *5*(2), 26-59.

Friedman, M. (1957). 'The permanent income hypothesis', in *A theory of the consumption function*, pp. 20-37.

Ghadwan, A. S., Wan Ahmad, W. M., & Hisham Hanifa, M. (2023). Financial planning for retirement: The moderating role of government policy. *Sage Open*, *13*(2), 21582440231181300.

Halim, S., Miller, T., &Dupont, D. C. (2010). How pension funds manage investment risks: A global survey. *Rotman International Journal of Pension Management*, *3*(2), 30.

Haase, R. F., & Ellis, M. V. (1987). Multivariate analysis of variance. Journal of Counseling Psychology, 34(4), 404.

Harvey, M., & Urban, C. (2023). Does financial education affect retirement savings?. *The Journal of the Economics of Ageing*, *24*, 100446.

Hastings, J. S., & Tejeda-Ashton, L. (2008). *Financial literacy, information, and demand elasticity: Survey and experimental evidence from Mexico* (No. w14538). National Bureau of Economic Research.

Hastings, J., Mitchell, O. S., &Chyn, E. (2011). Fees, framing, and financial literacy in the choice of pension manager. *Financial literacy: Implications for*

retirement security and the financial marketplace, *101*.

Hidalgo, B., & Goodman, M. (2013). Multivariate or multivariable regression?. American journal of public health, 103(1), 39-40.

Holzmann, R., Hinz, R. P., &Dorfman, M. (2008). Pension systems and reform conceptual framework. *World Bank Discussion Paper*, *824*.

Huang, C., Xie, X., Sitar, S., Qiao, X., Tang, B., & Liu, P. (2024). Effects of Pension and Financial Literacy on Life Satisfaction in Chinese Retired Older Adults: Mediation Effects of Diversified Portfolio and Financial Well-being.

Iglesias, A., & Palacios, R. J. (2000). *Managing public pension reserves-Part I: evidence from the international experience* (No. 21311). The World Bank.

INFE, OECD. (2011). Measuring financial literacy: Questionnaire and guidance notes for conducting an internationally comparable survey of financial literacy. *Periodical Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial Literacy*.

Ketkaew, C., Sukitprapanon, C., & Naruetharadhol, P. (2020). Association between retirement behavior and financial goals: A comparison between urban and rural citizens in China. *Cogent Business & Management*, *7*(1), 1739495.

Kim, J., Kwon, J., & Anderson, E. A. (2005). Factors related to retirement confidence: Retirement preparation and workplace financial education. *Financial Counseling and Planning*, *16*(2), 77–89.

Klapper, L., Lusardi, A., & Van Oudheusden, P. (2015). Financial literacy around the world. *Standard & Poor's Ratings Services Global Financial Literacy Survey., Access mode: http://media. mhfi. com/documents/2015Finlit_paper_17_F3_SI NGLES. pdf*.

Kpessa-Whyte, M. *(2013).* Pension privatization in Africa: The coercive power of an idea and the politics of retirement income security reforms in Ghana and Nigeria, *Developing Country Studies, 3(3), 94-106*.

Kumado, K., &Gockel, A. F. (2003). *A study on social security in Ghana*. Legon: University of Ghana.

Lusardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement planning: New evidence from the Rand American Life Panel. *Michigan Retirement Research Center Research Paper No. WP*, *157*.

Lusardi, A., & Mitchell, O. S. (2008). Planning and financial literacy: How do women fare? *American Economic Review*, *98*(2), 413-17.

Lusardi, A., &Mitchelli, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business economics*, *42*(1), 35-44.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of economic literature*, *52*(1), 5-44.

Mata, O. G. (2021). The effect of financial literacy and gender on retirement planning among young adults. *International Journal of Bank Marketing*.

Modigliani F. (1996) The life cycle hypothesis of saving, the demand for wealth and the supply of capital. *Social Research*, Pp.160-217

Naruetharadhol, P., Wongsaichia, S., Van Wouwe, M., & Ketkaew, C. (2021). Career status, retirement readiness, and age differences: Empirical evidence from skilled immigrants in Thailand. *Cogent Business & Management*, *8*(1), 1885572.

Novy-Marx, R., &Rauh, J. D. (2011). Policy options for state pension systems and their impact on plan liabilities. *Journal of Pension Economics & Finance*, *10*(2), 173-194.

Niu, G., & Zhou, Y. (2018). Financial literacy and retirement planning: evidence from China. *Applied Economics Letters*, *25*(9), 619-623.

OECD INFE (2011). Measuring Financial Literacy: Core Questionnaire in Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial literacy. Paris: OECD.

OECD, and Development Staff.(2005) *Improving financial literacy: Analysis of issues and policies*. Organisation for Economic Co-operation and Development. Paris: France.

Oggero, N., Figari, F., Fornero, E., & Rossi, M. (2023). Support for pension reforms: What is the role of financial literacy and pension knowledge?. *Journal of Accounting and Public Policy*, *42*(4), 107096.

Prast, H. M., & van Soest, A. (2016). Financial literacy and preparation for retirement. *Intereconomics*, *51*(3), 113-118.

Remund, D. L. (2010). Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of consumer affairs*, *44*(2), 276-295.

Suri, A., & Jindal, L. (2022). Financial literacy for well-being: Scientific mapping and bibliometric analysis. *Citizenship, Social and Economics Education*, *21*(3), 209-233.

Tan, S. & Singaravelloo, K. (2020). Financial literacy and retirement planning among government officers in Malaysia. *International Journal of Public Administration*, *43*(6), 486-498.

The National Pensions Act, Act 766 (2008), Accra Ghana.

Van Ginneken, W. (2003). Extending social security: Policies for developing countries. *International Labour Review*, *142*(3), 277-294.

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial economics*, *101*(2), 449-472.

World Bank Group. (2017). *The Evolution of the Canadian Pension Model: Practical Lessons for Building World-Class Pension Organizations*. World Bank.

Xu, S., Ali, S. T., Yang, Z., & Li, Y. (2023). Effect of household's financial literacy on pension decision making: evidence from China's new rural pension program. *Kybernetes*, *52*(10), 4611-4644.