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Exploring the impact of financial behavior on retirement financial planning: The moderating role of financial literacy

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Abstract

This study aims to examine the influence of financial behavior on retirement financial planning among working-age individuals in Hat Yai, Songkhla, Thailand, with a particular focus on the moderating role of financial literacy. Data were collected from 385 participants and analyzed using multiple regression and moderation techniques, with financial literacy categorized into financial knowledge, saving knowledge, and retirement knowledge. The findings reveal a strong and positive relationship between proactive financial behaviors and retirement financial planning, with saving knowledge showing the most significant moderating effect by amplifying the impact of financial behavior on retirement preparedness. These results confirm the essential role of financial literacy, particularly saving knowledge in strengthening the relationship between financial behavior and retirement readiness. The study offers practical insights for policymakers, educators, and financial service providers to design targeted financial literacy programs, emphasizing savings-oriented strategies to enhance retirement preparedness in economically diverse regional populations.

Keywords: Financial behavior, Financial literacy, Retirement financial planning.

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1. Introduction

The global population structure is undergoing a rapid demographic shift toward an aging society. In 2022, the proportion of children under 15 years old worldwide decreased from 34.72% in 1950 to 25.25%, while the elderly population increased to 13.90% of the total population. Thailand entered the aging society stage in 2005, with 10.4% of its population aged 60 and above, and became an aged society in 2024, reaching 20.36%. By 2036, Thailand is projected to become a super-aged society, with more than 30% elderly population [1]. This demographic transition poses significant economic and social challenges, particularly regarding financial security for retirees.

Retirement financial planning is a critical determinant of long-term well-being, encompassing not only income sufficiency but also independence and mental stability in later life. However, many individuals prioritize immediate consumption over long-term savings, often underestimating the risks of inadequate retirement preparation [2]. National data indicate that while 46.7% of households have considered retirement planning, only 14.4% actively follow a structured savings plan [3]. Early and disciplined retirement planning, supported by long-term investment strategies, is essential to ensuring financial security and reducing reliance on public welfare [4].

Hat Yai, the economic hub of southern Thailand, plays a strategic role in domestic and cross-border trade, particularly with Malaysia [5]. The city's working-age population is highly diverse in terms of occupation, income level, financial stability, and access to social security benefits. Variations in education and financial knowledge, combined with high living costs and income instability in certain sectors, contribute to differing capacities for retirement preparation. Understanding this local context is vital for designing effective, targeted financial education and retirement planning interventions.

Financial literacy is widely recognized as a key factor enabling individuals to make informed financial decisions, including the selection of retirement products, risk management, and long-term savings strategies. Previous studies have established a positive relationship between financial behavior and retirement planning [6-8]. However, limited attention has been given to the moderating role of financial literacy in this relationship, representing a critical research gap.

Accordingly, this study aims to: (1) examine the impact of financial behavior on retirement financial planning, and (2) assess the moderating role of financial literacy in this relationship among the working-age population in Hat Yai. The findings are expected to contribute to academic literature, inform policy development, and enhance individual financial preparedness, thereby supporting sustainable retirement and reducing the long-term fiscal burden on the state.

2. Literature Review

Policymakers and financial regulators have focused on financial literacy [9] by providing e-learning through their websites as well as collaborating with schools and universities to share financial literacy [10, 11]. Most researchers [12-14] reveal that a better understanding of financial literacy enhances financial performance.

2.1. Impact of Financial Behavior on Retirement Financial Planning

Financial behavior significantly influences retirement planning. Effective financial behaviors, such as consistent saving, prudent investing, and smart spending, directly enhance an individual's ability to achieve their retirement goals [8]. According to Cheng et al. [7], comprehensive financial planning, which includes budgeting, saving, investing, tax preparation, retirement planning, and risk management, substantially contributes to retirement preparedness by increasing financial stability and security during retirement years. Studies further reveal that individuals exhibiting disciplined financial behaviors, such as regular saving and thoughtful investment decisions, are more likely to meet their retirement goals compared to those without structured financial behaviors [15].

Empirical studies support this assertion, indicating that individuals who practice proactive financial management, characterized by informed investment and consistent savings behaviors, are significantly better prepared financially for retirement [6, 16-20]. These behaviors not only ensure financial sufficiency but also contribute to a broader sense of financial independence and security post-retirement.

2.2. Financial Literacy as a Moderator between Financial Behavior and Retirement Financial Planning

Financial literacy has emerged as a critical factor that moderates the relationship between financial behavior and retirement financial planning. Financial literacy refers to the capability to effectively understand and utilize financial knowledge in practical situations, including the calculation of interest, comprehension of inflation, and risk assessment [21].

Research consistently indicates that financial literacy enhances the positive effects of financial behavior on retirement planning. Individuals with higher levels of financial literacy are better equipped to make informed financial decisions, manage financial risks effectively, and optimize their savings and investment strategies, thereby improving retirement outcomes [16, 22, 23]. In contrast, individuals with lower financial literacy often exhibit suboptimal financial behaviors, including inadequate retirement savings and poor investment choices [15] which negatively affect their retirement preparedness [19, 24].

Further empirical evidence highlights that enhanced financial literacy strengthens the linkage between proactive financial behaviors and successful retirement planning [18, 20, 25]. It facilitates better decision-making, encourages more efficient allocation of financial resources, and promotes comprehensive understanding and anticipation of future financial needs [26-28]. In summary, financial literacy might significantly moderate the relationship between financial behavior and retirement financial planning, underscoring the importance of financial education programs aimed at improving financial knowledge and skills, thus fostering more effective financial behaviors and, consequently, better retirement outcomes. From the literature, hypotheses in this study are developed as follows:

H_1: There is a positive relationship between financial behavior and financial retirement planning.

H_2: Financial knowledge plays a positive moderating role in the relationship between financial behavior and financial retirement planning.

H_3: Saving knowledge plays a positive moderating role in the relationship between financial behavior and financial retirement planning.

H_4: Retirement knowledge plays a positive moderating role in the relationship between financial behavior and financial retirement planning.

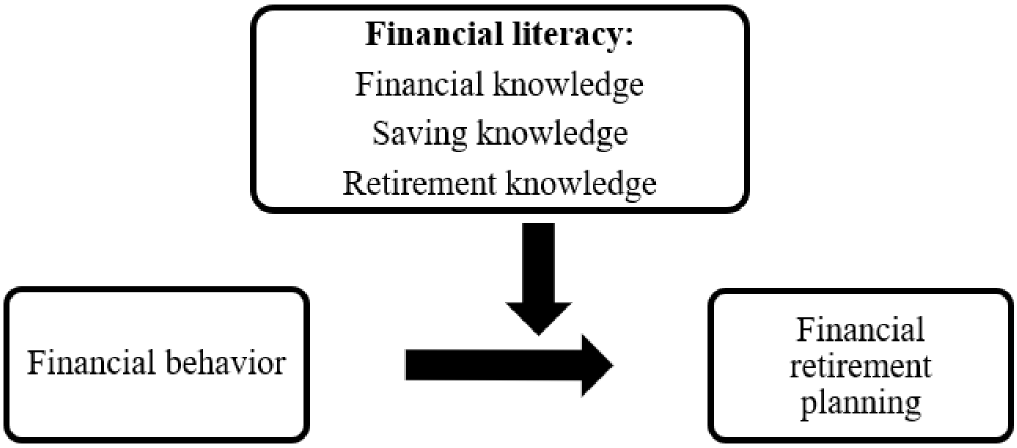

Figure 1.
Research framework.

3. Research Methods

The population and sample of this study consist of working-age individuals aged between 15 and 59 years old [3] who live in Hat Yai, Songkhla. As the exact population size was unknown, the sample size was calculated using Cochran's formula [29], resulting in a required sample size of 385 participants. To collect the data, convenience sampling was adopted.

The research instrument used in this study was a questionnaire designed by the researchers based on relevant concepts and literature reviews from Trakunkumjai et al. [24], Bank of Thailand [21], Porntawabancha et al. [19], Chaichiriwiwat [18] and Jirathumrong et al. [20]. The questionnaire is divided into four sections, including section 1: demographic information gathering, demographic data of the participants, such as gender, age, marital status, household size, education level, monthly income, and occupation. Section 2: Financial Literacy, which is defined in three components as shown in Table 1.

Table 1.
Financial Literacy Component.

Financial Knowledge	Saving Knowledge	Retirement Knowledge
- Time value of money - Loan interest payment - Inflation	- Saving and risk diversification - Saving in young age - Savings and revenue	- Retirement plan from social security organization - Annuity insurance - Provident funds - Retirement mutual fund

Note: There are four questions for each component of financial literacy; the total score is four.

Section 3: Financial behavior consists of 10 questions, which are measured using a 5-point Likert scale. Section 4: Retirement financial planning consists of 7 questions, which are measured using 5-point Likert scales.

All variables in this study, including financial literacy, financial behavior and retirement financial planning, are briefly described in Table 2.

Table 2.
Variable Description.

Variables	Symbol	Meanings
Dependents Financial retirement planning	FRP	Retirement financial planning was measured using a 5-point Likert scale, with rating from 1 to 5. A score of 1 indicates a complete lack of planning, while a score of 5 indicates a comprehensive retirement plan.
Independent Financial behavior	Beh	Financial behavior was measured using a 5-point Likert scale, where a score of 1 indicates poor financial behavior, while a score of 5 represents consistent financial practices.
Moderator Financial knowledge	FK	Financial knowledge is assigned a value of 1 when the overall financial knowledge score meets or exceeds the mean, and 0 otherwise.
Saving knowledge	SK	Saving knowledge is coded as 1 if the overall saving knowledge score is greater than or equal to the mean, and 0 otherwise.
Retirement knowledge	RK	Retirement knowledge is assigned a value of 1 when the retirement knowledge score meets or exceeds the mean, and 0 otherwise.

The instrument's content validity and reliability were tested using the Index of Item-Objective Congruence (IOC) and Cronbach's alpha coefficients. The results of the IOC and alpha coefficients were 0.99 and 0.89, respectively.

This indicates that the questionnaire can be used as a research instrument [30]. Moreover, this study was approved by the Human Research Ethics Center for Social and Behavioral Sciences Institutional Review Board (IRB) of Prince of Songkla University. The research protocol, instruments, and procedures complied with ethical standards for research involving human participants. The approval reference code is PSU IRB 2025-LL-FMS-016.

Participation in the study was voluntary, and all respondents provided informed consent prior to completing the questionnaire. Confidentiality and anonymity were assured throughout the data collection and analysis process.

To test all hypotheses, there are four models in this study, including one direct relationship model (H1) and three moderation role models, including the moderating role of financial knowledge (FK) on the relationship between financial behavior and financial retirement plan (H2), the moderating role of saving knowledge (SK) on the relationship between financial behavior and financial retirement plan (H3), and the moderating role of retirement knowledge (RK) on the relationship between financial behavior and financial retirement plan (H4). The model for H1 is presented as the following regression model.

$$FRP_i = \beta_0 + \beta_1 Beh_i + \varepsilon_i$$

For H2–H4, according to previous studies that focused on examining the moderating role, most studies predominantly examined models incorporating a single interaction term [31-34]. This study examines the moderating role of three interaction terms Beh × FK, Beh × SK, and Beh × RK independently across the following three regression models.

The following model was proposed to examine the moderating role of financial knowledge (FK) in the relationship between financial behavior and financial retirement plans (H2).

$$FRP_i = \beta_0 + \beta_1 Beh_i + \beta_2 FK_i + \beta_3 (Behi \times FK_i) + \varepsilon_i$$

To examine the moderating role of saving knowledge (SK) in the relationship between financial behavior and financial retirement plan (H3), the following model was proposed:

$$FRP_i = \beta_0 + \beta_1 Beh_i + \beta_2 SK_i + \beta_3 (Beh_i \times SK_i) + \varepsilon_i$$

The following model was proposed to examine the moderating role of financial knowledge (RK) in the relationship between financial behavior and financial retirement plans (H4).

$$FRP_i = \beta_0 + \beta_1 Beh_i + \beta_2 RK_i + \beta_3 (Beh_i \times RK_i) + \varepsilon_i$$

The coefficient β3 in all three regression models above is expected to be statistically significant, reflecting the significance of each dimension of financial literacy on the relationship between financial behavior and financial retirement plans.

4. Results

The research participants primarily consisted of working-age individuals from Hat Yai, Songkhla, mainly female (64.9%), aged 31-40 years (40.8%), and married (49.6%). Most had completed a bachelor's degree (64.4%), earned monthly incomes above 40,001 baht (27.3%), and were employed mainly as private company employees (62.3%).

Table 3.
Descriptive Statistics.

Variables	Min.	Max.	Mean	S.D.	Skewness	Kurtosis
Dependent variable						
FRP	1.714	5.000	4.073	0.693	-0.775	0.807
Independent Variable						
Beh	2.000	5.000	4.135	0.621	-0.628	0.098
Interaction Variables						
FK	0.000	4.000	2.545	1.035	-0.618	-0.165
SK	0.000	4.000	3.119	0.808	-0.608	-0.084
RK	0.000	4.000	2.714	1.114	-0.577	-0.269
FK (Dummy)	0.000	1.000	0.629	0.484	-0.535	-1.723
SK (Dummy)	0.000	1.000	0.362	0.481	0.577	-1.676
RK (Dummy)	0.000	1.000	0.609	0.489	-0.450	-1.808

Table 3 shows the descriptive statistics for all key variables in this study, as well as dummy variables generated to facilitate interaction and categorical analyses. The mean score for financial retirement planning (FRP) is 4.073 (SD = 0.693), indicating that, on average, participants exhibit a relatively high level of retirement planning. The distribution is negatively skewed (Skewness = -0.775) with moderate kurtosis (Kurtosis = 0.807), suggesting a slight clustering of scores toward the higher end of the scale. The financial behavior (Beh) variable demonstrates a similarly high mean score of 4.135 (SD = 0.621), reflecting good financial conduct among respondents. The distribution is slightly left-skewed (Skewness = -0.628), with nearly normal kurtosis (0.098), indicating an approximately symmetric distribution. For the financial literacy dimensions, first, financial knowledge (FK) shows a mean of 2.545 (SD = 1.035), reflecting moderate knowledge levels.

The distribution is slightly left-skewed (Skewness = -0.618), with platykurtic tendencies (Kurtosis = -0.165). Second, saving knowledge (SK) records a higher average of 3.119 (SD = 0.808), with similar left-skewness (Skewness = -0.608) and near-normal kurtosis (Kurtosis = -0.084). Third, retirement knowledge (RK) has a mean of 2.714 (SD = 1.114), also moderately high, with mild skewness (Skewness = -0.577) and a slightly flatter distribution (Kurtosis = -0.269).

Table 4.
Pearson Correlation Matrix for All Variables.

	FRP	**Beh**	**FK**	**FK (Dummy)**	**SK**	**SK (Dummy)**	**RK**	**RK (Dummy)**
FRP	1							
Beh	0.745***	1						
FK	0.146***	0.090*	1					
FK (Dummy)	0.019	-0.049	0.865***	1				
SK	0.186***	0.101**	0.293***	0.198***	1			
SK (Dummy)	0.066	-0.014	0.265***	0.285***	0.830***	1		
RK	0.130**	0.083	0.334***	0.233***	0.368***	0.259***	1	
RK (Dummy)	0.001	-0.021	0.214***	0.198***	0.218***	0.214***	0.875***	1

Note: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

There are several preliminary tests that were conducted prior to the regression analysis, as shown in Table 3 and Table 4. Table 4 presents the Pearson correlation coefficients among the study variables: financial retirement planning (FRP), financial behavior (Beh), and the dimensions of financial literacy (FK, SK, RK), including both continuous and dummy-coded formats. The correlation coefficient does not exceed 0.80 [30], which shows no evidence of problematic multicollinearity was found among the primary independent variables, financial behavior (Beh) and the continuous measures of financial knowledge (FK, SK, RK). All pairwise correlations among these variables were examined. This study conducted a normality test using skewness and kurtosis. Based on Table 3, the results indicated a normal distribution as skewness between -2 and +2 and kurtosis between -7 and +7 [30].

Table 5.
The Hypotheses Testing.

Variables	**Dependent Variable: Financial retirement planning (FRP)**			
	Model 1	**Model 2**	**Model 3**	**Model 4**
	H_1	**H_2**	**H_3**	**H_3**
	Beh	**Beh × FK**	**Beh × SK**	**Beh × RK**
Constant	0.638***	4.047***	4.038***	4.085***
Beh	0.831***	.845***	0.896***	0.828***
FK		0.076		
Beh × FK		-0.888		
SK			0.108**	
Beh × SK			-0.197**	
RK				0.022
Beh × RK				-0.039
R	0.745	0.724	0.749	0.725
R^2	0.554	0.524	0.561	0.525
F	476.414***	134.141	161.347	133.314
p	0.000	0.000	0.000	0.000

Note: † $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The regression analyses examined the direct relationship between financial behavior (Beh) and financial retirement planning (FRP), as well as the moderating roles of financial knowledge (FK), saving knowledge (SK), and retirement knowledge (RK) on the relationship between financial behavior (Beh) and financial retirement planning (FRP). The results are presented across four models as shown in Table 5 and explained as follows:

In Model 1, which tested the direct relationship between financial behavior and financial retirement planning, the findings reveal that financial behavior has a statistically significant positive effect on FRP ($\beta = 0.831$, $p < 0.001$). This model explains approximately 55.4% of the variance in FRP ($R^2 = 0.554$), indicating a strong explanatory power. The F-statistics are also highly significant ($F = 476.414$, $p < 0.001$), confirming the overall model fit.

These findings provide empirical support for Hypothesis 1, suggesting that individuals with stronger financial behavioral traits are more likely to engage in financial retirement planning. This result formulates the following model:

$FRP_i = 0.638 + 0.831Beh_i + \varepsilon_i$

Model 2 introduces financial knowledge (FK) as a potential moderator. While financial behavior remains a significant predictor of FRP ($\beta = 0.845$, $p < 0.001$), neither the main effect of FK ($\beta = 0.076$, $p > 0.05$) nor the interaction term Beh × FK ($\beta = -0.888$, $p > 0.05$) reaches statistical significance. The explained variance slightly decreases to 52.4% ($R^2 = 0.524$), and the overall model fit remains statistically significant ($F = 134.141$, $p < 0.001$).

These results suggest that financial knowledge does not significantly moderate the relationship between financial behavior and retirement planning, thus providing no support for Hypothesis 2. This result formulates the following model:

$FRP_i = 4.047 + 0.845Beh_i + 0.076FK_i – 0.888(Beh_i \times FK_i) + \varepsilon_i$

In Model 3, saving knowledge (SK) is tested as a moderator. The results show that both the main effect of SK ($\beta = 0.108$, $p < 0.01$) and the interaction term Beh × SK ($\beta = -0.197$, $p < 0.01$) are statistically significant. Financial behavior continues to demonstrate a strong positive association with FRP ($\beta = 0.896$, $p < 0.001$). The model explains 56.1% of the variance in FRP ($R^2 = 0.561$), which is the highest among all models, and the F-statistic remains significant ($F = 161.347$, $p < 0.001$). The significant negative interaction effect indicates that the positive impact of financial behavior on retirement planning is attenuated at higher levels of saving knowledge. These findings support Hypothesis 3 concerning saving knowledge. This result formulates the following model:

$FRP_i = 4.038 + 0.869Beh_i + 0.108SK_i - 0.197(Beh_i \times SK_i) + \varepsilon_i$

Lastly, Model 4 includes retirement knowledge (RK) as a moderator. While financial behavior retains its significant positive effect on FRP ($\beta = 0.828$, $p < 0.001$), neither the main effect of RK ($\beta = 0.022$, $p > 0.05$) nor the interaction term Beh × RK ($\beta = -0.039$, $p > 0.05$) is statistically significant. The model explains 52.5% of the variance in FRP ($R^2 = 0.525$), and the model fit is significant ($F = 133.314$, $p < 0.001$). These results indicate that retirement knowledge does not significantly moderate the relationship between financial behavior and financial retirement planning, thus failing to support Hypothesis 4 with respect to retirement knowledge. This result formulates the following model:

$FRP_i = 4.085 + 0.828Beh_i + 0.022RK_i -0.039(Beh_i \times RK_i) + \varepsilon_i$

In summary, the analyses confirm that financial behavior is a strong and consistent predictor of financial retirement planning. Among the proposed moderators, only saving knowledge demonstrates a significant moderating effect, though in a direction that slightly weakens the positive relationship. Financial knowledge and retirement knowledge do not exhibit significant moderating influences in this context.

5. Conclusion and Discussion

This research confirms the critical influence of financial behavior on retirement financial planning among working-age individuals in Hat Yai, Songkhla. The results indicate that proactive financial behaviors [6, 16, 17, 20, 35] as well as financial literacy [10, 14, 26-28] as financial knowledge, savings knowledge, and strategic retirement investment knowledge, significantly enhance retirement financial preparation. Importantly, financial literacy, particularly understanding of saving strategies, plays a significant moderating role. Improved levels of financial literacy would expand the positive impacts of financial behaviors, enabling individuals to effectively confirm financial discipline into robust retirement financial plans [7, 8, 16, 18-20, 32].

This finding emphasizes the necessity of structured financial practices for achieving financial wisdom after individual retirement. The current study advances scholarly discourse by empirically establishing financial literacy as a key moderating factor in the relationship between financial behavior and retirement planning. Surprisingly, the research highlights that only saving knowledge exhibits a stronger moderating effect compared to financial knowledge and retirement knowledge. This differential impact points out the key needs for targeted educational interventions, particularly emphasizing savings-oriented literacy, to enhance retirement outcomes.

This study significantly contributes to the existing academic literature by explaining the roles of financial literacy in moderating the link between financial behavior and financial retirement planning.

The findings provide valuable insights for policymakers, educators, and financial service providers, facilitating the development of targeted financial education programs and retirement-oriented financial products. Emphasizing savings knowledge initiatives develops as a strategic priority, offering a clear pathway for enhancing financial retirement preparedness among working-age populations. To explain the contribution for each domain, firstly, this research enriches the academic discourse by addressing the alternative context of financial behavior and financial retirement planning in Thailand's regional cities, particularly economic hubs like Hat Yai, and clarifies the moderating effect of financial literacy.

Secondly, results provide valuable insights for government agencies, local authorities, and the corporate sector to design and implement personalized retirement planning policies and programs aligned with local working-age individuals' behavior and financial literacy levels. Thirdly, by highlighting the critical role of financial literacy, the study underlines the importance of raising awareness and improving personal financial planning skills, enabling individuals and households to plan effectively for retirement and achieve an adequate standard of living after retirement.

Lastly, promoting sustainable retirement planning contributes to reducing state welfare costs, fostering a self-reliant society, and enhancing overall social stability and economic resilience by ensuring that individuals can independently sustain themselves financially in retirement.

Additionally, future research should explore the long-term efficacy of various financial literacy interventions to deepen understanding of their sustainable impacts as well as the sufficiency of retirement funds.

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