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Article

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Mediating factors in retirement savings and well-being: a focused study on Sarawak

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ABSTRACT

This study aims to examine the factors that influence societal savings habits and pre-retirement well-being. Triggered by the global trend of low personal interest rates, it seeks to illuminate how preparedness for retirement affects the overall quality of life and societal well-being. More specifically, the study pursues three (3) main objectives: 1) to identify the socio-demographic and behavioural elements that shape societal savings habits; 2) to determine the factors that affect individuals' propensity to save; and 3) to assess the impact of savings behaviours on pre-retirement well-being, focusing on aspects such as happiness, prosperity, health, comfort, and security. We used the Partial Least Squares Structural Equation Model (PLS-SEM) with SMART-PLS to analyse these relationships. The results illustrate significant correlations among financial literacy, savings habits, financial risk tolerance, future time perspectives, retirement savings, and retirement well-being. These findings bolster the study's conclusions, which are further supported by active survey participation.

IMPACT STATEMENT

The research presented in this paper examines the critical intersection of retirement savings, individual well-being, and savings habits. In an era marked by economic uncertainty, understanding how savings habits impact long-term financial security and overall quality of life is of paramount importance. Our study delves into the complex dynamics that influence retirement saving decisions and their implications for individuals, families, and society as a whole. By exploring the relationship between savings habits and well-being indicators such as financial stress, mental health, and overall life satisfaction, we aim to provide insights that can inform policy interventions and financial literacy initiatives. The findings of this research have significant implications for public policy, financial institutions, employers, and individuals alike. By identifying barriers to effective retirement saving and highlighting strategies to promote greater financial resilience, we hope to contribute to the development of policies and programs that support retirement security for all segments of the population. Thank you for considering the public interest implications of our research and for your support in advancing our collective efforts to promote financial well-being and retirement security.

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perspective; retirement;
well-being; PLS-SEM



SUBJECTS

Economic Psychology;
Public Finance; Pensions;
Economics

1. Introduction

Savings are pivotal for socioeconomic development, as they affect the well-being of nations, regions, communities, and individuals. The increase in life expectancy has led to a corresponding rise in savings behaviour (Curtis et al., 2017). In Malaysia, however, insufficient savings rates are a pressing concern, with many individuals lacking adequate retirement funds (Shagar, 2016).

Studies indicate that nearly 90% of Malaysian households do not have sufficient emergency savings and carry significant debt (Ngui, 2016; Shukry, 2014). The high cost of living is a major factor contributing to inadequate savings (Credit Counselling & Debt Management Agency, 2018). This situation

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underscores the need for targeted financial interventions. Savings habits are generally intended to secure future needs, such as retirement and education. Nevertheless, some literature critiques these habits as myopic, driven by immediate consumption patterns (Pollak, 1970; Spinnewijn, 2015). Retirement planning, which includes savings and pensions, is also associated with work-related stress and familial strain in later life (Coursolle et al., 2010; Feldman & Beehr, 2011).

Well-being, closely linked to happiness and life satisfaction, reflects individuals' perceptions of their lives. Positive living conditions, including stable housing and employment, are integral to well-being. High subjective well-being is characterised by pleasant emotions, minimal negative moods, and overall life satisfaction (Diener et al., 2010). Despite this, many individuals face challenges with retirement savings, with 90% of rural and 86% of urban households having no savings (Malaysian Digest, 2016).

Savings influences lifestyle, emergency preparedness, and financial goals. Savers generally experience better mental well-being when compared to borrowers, who often face financial strain from debts, such as credit cards and loans (Anong & DeVaney, 2010; Hira, 1987; Lee et al., 2000; Livingstone & Lunt, 1993). Research in Malaysia has shown that certain ethnic groups are more prone to exceeding their income and accumulating credit card debt (Loke, 2016). Consequently, ethnicity has been identified as a significant factor in predicting financial behaviour (Garrison & Gutter, 2010; Hira et al., 2013; León & Pfeifer, 2017). Strong financial health positively impacts psychological support, personal satisfaction, and overall quality of life (Abdul Mutalib et al., 2017; Makhtar et al., 2016).

This study aims to examine the mediating factors influencing the relationship between retirement savings and well-being in Sarawak. It will investigate the impact of financial literacy, cultural attitudes, income levels, and regional variations on savings behaviour and overall well-being. Additionally, this investigation will assess how debt and financial pressure mediate this relationship. The findings will be used to develop targeted recommendations for enhancing retirement savings strategies and improving well-being in Sarawak, Malaysia.

2. Literature review and theoretical framework

Our approach is based on the idea that daily spending habits can provide insight into long-term savings habits. The theory we follow suggests that individuals who manage their spending effectively are also likely to save consistently over time, including for retirement. To better understand how people save for retirement, we used six (6) specific spending measures. These measures provide a clearer and more accurate picture of spending habits and how they contribute to retirement savings.

2.1. Financial literacy

Financial literacy is not solely about acquiring knowledge; it also involves the ability to apply that knowledge in real-life situations. If individuals lack the abilities or confidence to put what they know into practice, it will likely be difficult to translate financial literacy into practical retirement savings habits. Individuals engage in personal money management within a changing society to develop financial literacy, gain financial knowledge, and understand the consequences that affect their financial decisions on themselves, others, and the environment (Remund, 2010).

A low level of financial literacy can lead to credit issues, which may result in bankruptcy and facilitate a more significant level of budgetary proficiency. Therefore, individuals must prioritise and carefully manage their spending and savings activities to achieve a good level of financial well-being (Ali et al., 2013). Small savings programmes, financial literacy, and financial behaviour have a significant positive effect on savings habits, making a significant impact (Mohanta & Dash, 2022).

2.2. Self-efficacy

Self-efficacy refers to the belief in one's potential and confidence to execute and accomplish a particular behaviour. It implies that individuals who possess strong self-efficacy are less likely to attempt behaviours they believe will fail. This belief system internally influences how individuals feel, think, behave, and motivate themselves, encompassing cognitive, motivational, affective, and selection functions.

Individuals with a higher level of self-efficacy are more confident in their abilities to execute and complete activities; they approach challenges with a higher level of optimism and actively pursue successful outcomes. In contrast, those with low levels of self-efficacy are more reserved and lack the confidence to execute challenging tasks (Bandura, 1994).

2.3. Trend in society savings

Throughout the years, household debt levels have increased significantly in many countries. Households are often spending more than what they can afford, with some using all or most of their income to pay off debts (Rahman et al., 2016). Studies reveal that habitual patterns of low savings awareness contribute to high debt levels, resulting from the overuse of credit, poor budgeting, overspending, inadequate shopping and spending skills, low salaries, and a lack of financial literacy in money management (CEIC, 2021).

The number of accounts involved can also influence societal savings and spending decisions. Individuals tend to save more when they have a single account, as compared to multiple accounts (Mishra et al., 2013). Additionally, factors influencing societal decision making includes how much to contribute, which funds to invest in, and how to allocate resources to different funds (Goldstein et al., 2008). Demographic data, such as age and gender, can explain variations and transitions in savings behaviour; these variables are powerful predictors of savings and spending habits (Banks & Tanner, 1999; Furnham, 1999).

Few studies have revealed that the 'own now, pay later' credit mentality is spreading among younger people. They have suggested that savings trends fluctuate significantly among households, even though other socio-demographic household backgrounds remain consistent (Urbis et al., 2008; Venti & Wise, 1998). These variances have been attributed to preference and attitude factors, such as risk tolerance, time preferences, future uncertainties, occupational choices, and lifetime earnings (Bernheim et al., 2001). Some studies highlight the influence of socio-demographic and socioeconomic aspects on savings trends across households, including occupational status, family type and size, cultural and racial status, and marital status. Previous studies have also found that these factors are associated with savings behaviour (Guariglia, 2001; Gutter et al., 1999; Liberda & Tokarski, 1999).

Children's attitudes towards savings are also significant. As children grow up, they develop an understanding of savings practices and benefits. Proper mentorship and nurturing of savings habits are essential for their financial development (Sonuga-Barke & Webley, 1993).

Married couples, for instance, are generally more likely to contribute to savings. In fact, marital status has been identified as a key determinant of savings (Alessie et al., 1999). However, the presence of children often negatively affects savings due to increased family expenses, leaving less money for savings (Browning & Lusardi, 1996; Douthitt & Fedyk, 1989). It has also been found that marital status transitions and children have significant effects on optimal household savings decisions (Love, 2010).

Many studies have shown that society members are cutting down on monthly expenditures and foregoing important expenses, such as children's education, private medical care, and entertainment. Individuals also save money by opting for cheaper brands of goods and reducing the number of trips to town (Ling & Wong, 2012). Studies indicate a positive relationship between age and savings, with older individuals generally having higher savings rates (Browning & Lusardi, 1996; Demery & Duck, 2006).

Both males and females exhibit different risk and hazard management strategies, which influence their savings and spending choices. However, these differences in savings between genders remains unclear (Croson & Gneezy, 2009). Nevertheless, research conducted in the United States of America has found that financial behaviour and savings levels differs between genders, with women generally having lower levels of savings and wealth when compared to men (Gottschalck, 2008).

2.4. Savings habits

Understanding savings behaviour requires a nuanced view of how individuals allocate their resources. While saving is typically discussed in the context of long-term goals (e.g. retirement), short-term spending habits can also provide valuable insights into overall savings patterns. The existing literature

highlights that spending behaviours frequently reflect underlying savings tendencies. Individuals who exhibit disciplined spending habits are more likely to maintain structured savings routines.

Obagbuwa and Kwenda (2020) state that a person is classified as a poor spender if they demonstrate poor discipline in their spending behaviour. Their study also found that students with good financial management skills allocate a larger proportion of their money to purchasing durable goods (e.g. items related to education and housing), for investment purposes. Spending habits can vary and include impulse buying, shopping as a basic habit, frequent small purchases, and neglecting to save.

Savings habits pertain to how individuals manage, allocate, and save their financial resources (Mardiana & Rochmawati, 2020). Developing effective savings habits is crucial for achieving financial stability and reaching long-term goals. This process begins with setting clear goals, such as building an emergency fund for a financial safety net, saving for a vacation, making a down payment on a house, or planning for retirement.

Creating and adhering to a budget is essential for tracking income and expenses, ensuring that a portion of earnings is consistently saved. Maintaining discipline and consistency in savings habits contributes to continued financial well-being and prepares individuals for future financial endeavours. More specifically, educating people and creating job opportunities can enhance savings habits among community members (Fenta et al., 2017). Attitudes towards savings are often linked to education and lifestyle (Satsios & Hadjidakis, 2018), and generally, most people have positive attitudes towards savings (Yusof et al., 2018).

2.5. Future time perspective

Future time perspective refers to a broad awareness of, and careful thought about, one's future, including the capacity to predict, anticipate, and prepare for desired future outcomes. This ability is vital for personal well-being, can be acquired through experience, and may evolve in response to changing circumstances over time (Kooij et al., 2018). Having a future-time perspective positively impacts financial management by promoting a clearer financial overview. This, in turn, facilitates techniques, such as mental budgeting, where budgets are allocated to different classifications of expenses or common expenditures (e.g. housing costs, utilities, groceries, healthcare, transportation) to prevent overspending (Antonides et al., 2011). Properly categorising expenses helps individuals to better understand where their money is being spent, track their financial health, and make informed decisions about budgeting and spending habits. Tomar et al. (2021) also suggests that the future time perspective and retirement goals play intermediary roles.

2.6. Financial risk tolerance

Financial risk tolerance refers to an individual's readiness and ability to handle fluctuations in investment values in pursuit of potentially higher returns. This tolerance varies based on factors such as age, income, goals, and personal temperament. It is commonly assessed using tools like questionnaires and influences investment decisions by determining whether one prefers conservative, moderate, or aggressive strategies. Understanding and regularly reassessing one's risk tolerance is important in crafting investment portfolios that align with personal goals and comfort levels while adapting to changes in financial circumstances.

Prior research indicates that financial risk tolerance significantly includes investment decision-making (Mubaraq et al., 2021; Wulandari & Iramani, 2014). Since investing involves risk, individuals respond differently based on their comfort level with risk and the potential rewards (Zahwa & Soekarno, 2023).

3. Methodology

3.1. A model of savings habits and hypotheses

The model of savings habits and hypotheses, shown in Figure 1. Socio-economic and demographic characteristics play significant roles in shaping and influencing savings habits. External factors (e.g. economic

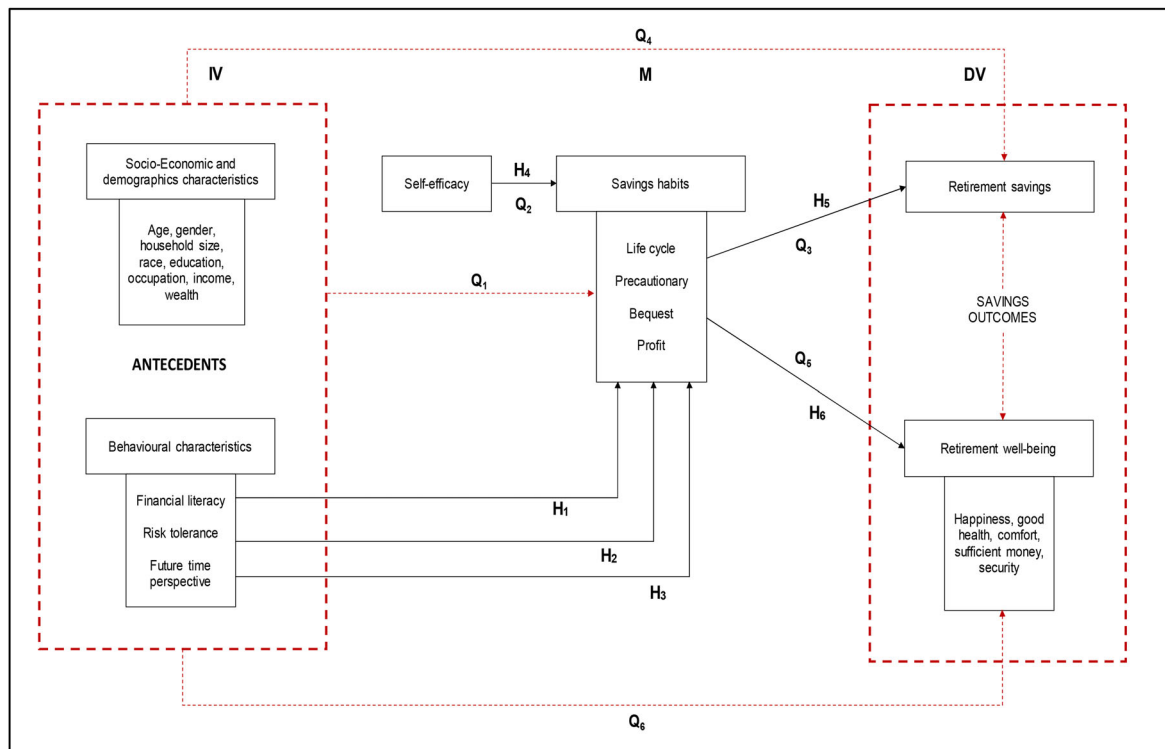


Figure 1. Model of saving habits.

status, social status) are likely to influence savings habits. Meanwhile, demographic characteristics (e.g. ethnicity, educational background, age) are also likely to influence savings. These factors are denoted as Q_1 .

High levels of self-efficacy in financial matters can also contribute to more confidence and capability in managing finances effectively. Individuals with higher levels of self-efficacy in finance are more likely to take risks, invest, and engage in long-term financial planning. These factors are denoted as Q_2 . Hence, hypotheses are proposed for Q_1 and Q_2 .

Financial literacy helps people save more money because it teaches them how to manage their finances better. When people understand things better (e.g. budgeting, investing), they are more likely to set aside money regularly, avoid debt, and plan for the future. In general, knowing how money works leads to better saving habits. Consequently, the first is as follows:

H_1 : Financial literacy has a positive relationship with savings habits.

People who are comfortable with taking financial risks often save more money, because they invest in things that can grow faster. They are willing to maintain investments through market fluctuations, which helps their savings grow over time. They also tend to diversify their investments, which contributes to greater savings accumulation. Hence, the second hypothesis is as follows:

H_2 : Financial risk tolerance has a positive relationship with savings habits.

People who focus on their future are more likely to save consistently. In other words, those who plan ahead and consider future needs tend to be more proactive in regularly setting aside funds and making good savings choices. Hence, the third hypothesis is as follows:

H_3 : Future time perspective has a positive relationship with savings habits.

Q_3 denotes the developing intention to save and the strength of an individual's commitment to reserving a portion of their income for retirement. Q_4 indicates the direct and unintentional outcome between the socio-economic and demographic variables on savings, which signifies unplanned savings.

Self-efficacy plays a crucial role in effective money management by fostering the belief that individuals can successfully save and manage their finances. When people have confidence in their abilities, they

are more likely to maintain their savings, overcome financial challenges, set and achieve financial goals, and plan their finances with greater efficacy. This increased confidence contributes to improved savings behaviours and overall financial management. Hence, the fourth hypothesis is as follows:

H₄: Self-efficacy has a positive relationship with savings habits.

Disciplined savings habits are likely to lead to significant growth in retirement savings over time. Consistently setting money aside and avoiding unnecessary spending are crucial for building a robust financial foundation for retirement, ultimately contributing to long-term financial security and stability. Hence, the fifth hypothesis is as follows:

H₅: Saving habits have a positive relationship with retirement savings.

Furthermore, Q₅ predicts a relationship between savings habits and retirement well-being, while Q₆ indicates a direct relationship between socio-demographic elements and retirement well-being.

Regularly and efficiently saving money greatly improves quality of life in retirement. Cultivating solid savings habits leads to greater financial security, the ability to maintain a desired lifestyle, reduced financial stress, and overall higher satisfaction during retirement. Consistent savings practices throughout one's career can help ensure a more stable and fulfilling retirement experience. Hence, the sixth hypothesis is as follows:

H₆: Savings habits have a positive relationship with retirement well-being.

3.2. Instrument design and sampling technique

This study applies a quantitative approach using primary data collected through an online survey created with Google Forms. The survey utilised questions with a 5-point Likert scale, where 1 = Strongly Agree and 5 = Strongly Disagree, to gather respondents' opinions.

This study measured savings habits, tendencies to save, and retirement well-being among the residents of Sarawak, a state in Malaysia, using a simple random sampling technique. It is important to study the savings habits of individuals from Sarawak in the context of retirement savings and retirement well-being. This is because Sarawak (apart from Kedah, Kelantan, Perlis, Sabah and Terengganu) has experienced the highest increases in poverty rates in Malaysia by virtue of the inequality and imbalanced development of the nation in terms of wealth, income, education, and infrastructure (Department of Statistics Malaysia, 2022).

3.3. Measurement of variables

Table 1 presents a list of measurement variables relevant to the questions in the questionnaire, focusing on working adults.

3.4. Partial least squares structural equation modeling (PLS-SEM)

The PLS-SEM was employed in this study to predict outcomes related to retirement savings and well-being. The conceptual framework, shown in Figure 2, illustrates the interrelationships between self-efficacy, financial literacy, financial risk tolerance, and future time perspective with savings habits, retirement savings and retirement well-being.

The list of constructs and indicators is tabulated in Table 2.

4. Findings

4.1. Survey results

Out of 700 targeted respondents, we received 400 responses, representing a 57% response rate. The sample size of 400 complies with the recommendation of Tabachnick and Fidell (2007), who state that a study's sample size should be greater than 300, as this number is considered comfortable and

Table 1. List of measurement variables relevant to the questionnaire.

Variable description	Variable Name	Question asked in the survey	Source
Age	Continuous variable	How old are you? 1. 21–30 2. 31–40 3. 41–50 4. 51–60 5. 61–65 6. 66 & above	Shanmugam and Abidin (2013), Rider (2014), Mahdzan and Tabiani (2013)
Gender	Dummy variable	1. Male 2. Female	
Marital status	Dummy variable	1. Married 2. Separated 3. Divorced 4. Widowed 5. Never married	
Ethnicity	Dummy variable	1. Malay 2. Chinese 3. Native 4. Indian 5. Other	
Type of place	Dummy variable	1. Kuching 2. Samarahan 3. Serian 4. Sri Aman 5. Betong 6. Sarikei 7. Mukah 8. Sibul 9. Kapit 10. Bintulu 11. Miri 12. Limbang	Mikolajczak and Golas (2014) <i>N Note:</i> 1. Village 2. Town (with population up to 100 thousand inhabitants) 3. City (with population over 100 thousand inhabitants)
Education Level	Continuous variable	1. Primary school 2. Secondary school 3. Degree 4. Postgraduate	Mahdzan and Tabiani (2013), Shanmugam and Abidin (2013), Mikolajczak and Golas (2014)
Occupational status	Dummy variables	1. Private sector 2. Public sector 3. Self-employed 4. Retired 5. Unemployed	Mahdzan and Tabiani (2013)
Monthly gross salary	Continuous variable	1. Below RM1500 2. RM1500–RM2000 3. RM2001–RM2500 4. RM2501–RM3000 5. RM3001–RM3500 6. RM3501–RM4000 7. RM4001–RM4500 8. RM4501–RM5000 9. RM5001–RM5500 10. Above RM5500	Hira et al. (2013), Gutter and Copur (2011)
Expectations of the economy	Dummy variable	Over the next 5 years, how do you expect Sarawak economy would be as it has over the past 5 years? 1. Better 2. Worse 3. About the same	Mahdzan and Tabiani (2013)
Expectations of interest	Dummy variable	5 years from now, how would you rate the interest rates? 1. Higher 2. Lower 3. About the same	–
Expectations of income	Dummy variable	Over the next year, how do you expect your income to be? 1. Up more 2. Up less 3. About the same	–
Financial planning horizon	Dummy variable	In planning saving and spending, which of these time periods is most important to you? 1. Next few months	–

(continued)

Table 1. Continued.

Variable description	Variable Name	Question asked in the survey	Source
Risk tolerance level	Dummy variable	2. Next year 3. Next few years 4. Next 5–10 years 5. Longer than 10 years Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or invest? 1. Take substantial financial risks expecting to earn substantial returns 2. Take above average financial risks expecting to earn above average returns 3. Take average financial risks expecting to earn average returns 4. Not willing to take any financial risks	–
Self-efficacy	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 6 items	1. Stick to spending plan 2. Progress towards my financial goals 3. Use credit for unexpected expenses 4. Have a hard time solving financial challenge 5. Worry about money in retirement	Goi et al. (2019), Lown (2011), Gutter and Copur (2011)
Financial literacy	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 6 items	1. Know about financial planning and retirement 2. Know more than most people about retirement planning 3. Confident in retirement planning 4. Know where to obtain information 5. Know how Social Security works 6. Know how private investment plans work	Shanmugam and Abidin (2013), Lawson and Hershey (2005)
Saving habits	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 6 items	1. Follow a monthly budget 2. Prepare a list ahead of time before shopping 3. Purchase items which are reasonable price 4. Do not spend on items not required 5. Bring small cash to prevent impulsive spending 6. Never bring credit/debit card out	Stawski et al. (2007), Goi et al. (2019)
Future time perspective	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 6 items	1. Save for a rainy day 2. Will live years into the future 3. Distant future is too uncertain 4. Future seems vague and uncertain 5. Live on day-to-day basis 6. Live in the moment, not knowing what tomorrow will bring	Lawson and Hershey (2005)
Financial risk tolerance	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 5 items	1. Willing to risk financial losses 2. Prefer investments with higher returns, though riskier	Lawson and Hershey (2005)

(continued)

Table 1. Continued.

Variable description	Variable Name	Question asked in the survey	Source
Retirement saving	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 5 items	3. Growth potential of retirement investment more important than the level of risk investment	Lawson and Hershey (2005)
		4. Willing to make risky investment to ensure financial stability in retirement	
		5. Never choose the safest investment plan when planning for retirement	
		1. Make meaningful contributions	
		2. Save a great deal	
Retirement well-being	Five-point Likert scale 1 = Strongly Agree & 5 = Strongly Disagree 11 items Item 1–7 (overall life satisfaction) Item 8–11 (financial/ retirement well-being)	3. Accumulate substantial savings	Campara et al. (2017), Rider (2014), Hira et al. (2013) Gutter and Copur (2011)
		4. Make a conscious effort	
		5. Have saved accordingly	
		1. Have everything you need	
		2. Satisfied with the things you have	
		3. Feel happy with the way you are	
		4. Satisfied with your life	
		5. A happy person	
		6. Feel fulfilled by the life you lead	
		7. Feel comfortable with the amount you owe	
		8. Constantly worried about paying your debts	
		9. Have had discussions with other people (parents, friends, spouse, and others) about your debts	

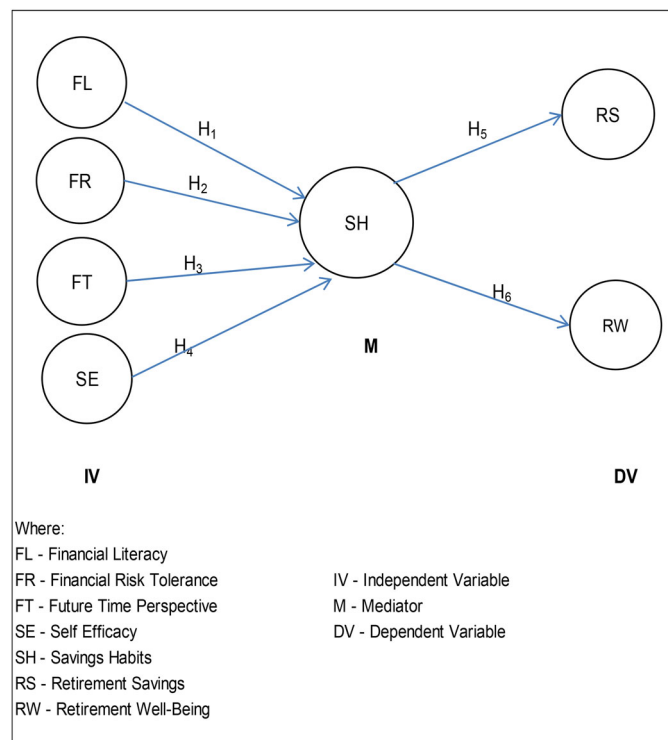
**Figure 2.** PLS-SEM path model.

Table 2. List of constructs and indicators.

No	Construct	Indicator	Statement
1	Self-efficacy (SE)	SE1	It is hard to stick to my spending plan when unexpected expenses arise.
		SE2	It is challenging to make progress toward my financial goals.
		SE3	When unexpected expenses occur, I usually have to use credit.
		SE4	When faced with a financial challenge, I have a hard time figuring out a solution.
2	Financial literacy (FL)	SE5	I worry about running out of money when I retire.
		FL1	I am very knowledgeable about financial planning for retirement.
		FL2	I know more than most people about retirement planning.
		FL3	I am very confident in my ability to do retirement planning.
		FL4	When I have a need for financial services, I know exactly where to obtain information on what to do.
		FL5	I am knowledgeable about how Social Security, i.e. EPF & SOCSO, works.
3	Savings habits (SH)	FL6	I know how private investment plans work.
		SH1	I always follow a monthly budget.
		SH2	I prepare a list of required items ahead of time before shopping.
		SH3	I ensure that I purchase items at a reasonable price.
		SH4	I do not spend on items I do not require.
		SH5	I always bring a small amount of cash to prevent impulsive spending.
4	Future time perspective (FT)	SH6	I never bring credit/debit cards out.
		FT1	I follow the advice to save for a rainy day.
		FT2	I enjoy thinking about how I will live years into the future.
		FT3	The distant future is too uncertain to plan for.
		FT4	The future seems very vague and uncertain to me.
		FT5	I am pretty much live on a day-to-day basis.
5	Financial risk tolerance (FR)	FT6	I enjoy living for the moment, not knowing what tomorrow will bring.
		FR1	I am willing to risk financial losses.
		FR2	I prefer investments that have higher returns, even though they are riskier.
		FR3	The overall growth potential of a retirement investment is more important than the level of risk of the investment.
		FR4	I am very willing to make risky investments to ensure financial stability in retirement.
		FR5	As a rule, I would never choose the safest investment when planning for retirement.
6	Retirement savings (RS)	RS1	I make meaningful contributions to a voluntary retirement savings plan.
		RS2	Compared to my peers, I have saved a great deal for retirement.
		RS3	I have accumulated substantial savings for retirement.
		RS4	I make a conscious effort to save for retirement.
		RS5	Based on how I plan to live my life in retirement, I have saved accordingly.
7	Retirement well-being (RW)	RW1	I have everything I need.
		RW2	I am satisfied with the things I have.
		RW3	I feel happy with the way I am.
		RW4	I am satisfied with my life.
		RW5	I am a happy person.
		RW6	I feel fulfilled by the life I have.
		RW7	I feel uncomfortable with the amount I owe.
		RW8	I am constantly worried about paying my debts.
		RW9	I have had discussions with other people (parents, friends, spouse, and others) about my debts.

presentable. Our sample size also adheres to Roscoe's (1975) guidelines, as cited in Sekaran and Bougie (2009), which indicate that a sample size greater than 30 and less than 500 is generally appropriate for most research investigations. The demographic data is presented in Table 3.

4.2. Assessment of model

Based on the formative measurement model in Figure 3, 6 direct hypotheses are developed between the constructs. To examine the significance level, t-statistics for all paths are generated via SmartPLS. Following the assessment of the path coefficient (Table 4), 5 relationships, namely (i) Financial Literacy -> Saving Habits, (ii) Saving Habits -> Retirement Saving, (iii) Saving Habits -> Retirement Well-Being, (iv) Financial Risk Tolerance -> Saving Habits, and (v) Future Time Perspective -> Saving Habits are found to have a t-value ≥ 1.96 (two-tailed test) at the 0.05 level of significance. One (1) relationship, Self-Efficacy -> Saving Habits, has a t-value ≤ 1.96 (two-tailed test) at the 0.05 level of significance. More specifically, the predictors of Financial Literacy ($\beta = 0.231, p < 0.01$), Financial Risk Tolerance ($\beta = 0.217, p < 0.01$), and Future Time Perspective ($\beta = 0.493, p < 0.01$) are positively related

Table 3. Respondents demographic.

	Frequency (N)	Percent (%)
Gender		
Male	190	47.5
Female	210	52.5
Race		
Malay	70	17.5
Chinese	170	42.5
Native	146	36.5
Indian	4	1
Other	10	2.5
Age		
21–30	142	35.5
31–40	112	28
41–50	100	25
51 and above	46	11.5
Marital status		
Single	200	50
Married	186	46.5
Divorced	9	2.25
Widowed	5	1.25
Location		
Kuching	78	19.5
Samarahan	20	5
Serian	12	3
Sri Aman	34	8.5
Betong	21	5.25
Sarikei	41	10.25
Mukah	20	5
Sibu	54	13.5
Kapit	21	5.25
Bintulu	55	13.75
Miri	32	8
Limbang	12	3
Education		
No formal	0	0
Secondary	36	9
STPM/Pre-University	15	3.75
Diploma/Vocational	126	31.5
Degree	181	45.25
Postgraduate	42	10.5
Monthly income (Ringgit Malaysia)		
1500 and below	25	6.25
Between 1500–2499	129	32.25
Between 2500–3499	63	15.75
Between 3500–4499	46	11.5
Between 4500–5499	28	7
RM5500 and above	109	27.25
Employment		
Private sector	267	66.75
Public sector	42	10.5
Self-employed	81	20.25
Unemployed	1	0.25
Retired	5	1.25
Student	1	0.25
Other	3	0.75
Length of service (years)		
Less than 5	44	11
Between 5–10	152	38
Between 11–15	77	19.25
Between 16–20	53	13.25
21–25	35	8.75
Between 26–30	28	7
More than 30	11	2.75
Total	400	100

to Savings Habits, which explains 52.3% of the variance in savings habits. Thus, H_1 , H_5 , and H_6 are supported.

The R^2 values are 0.523 for H_1 , 0.441 for H_5 and 0.337 for H_6 , which are all greater than the value of 0.260. Therefore, according to Cohen (1988) and Hair et al. (2017), the model is substantial. The subsequent results of the effects of Savings Habits on Retirement Savings and of Savings Habits on

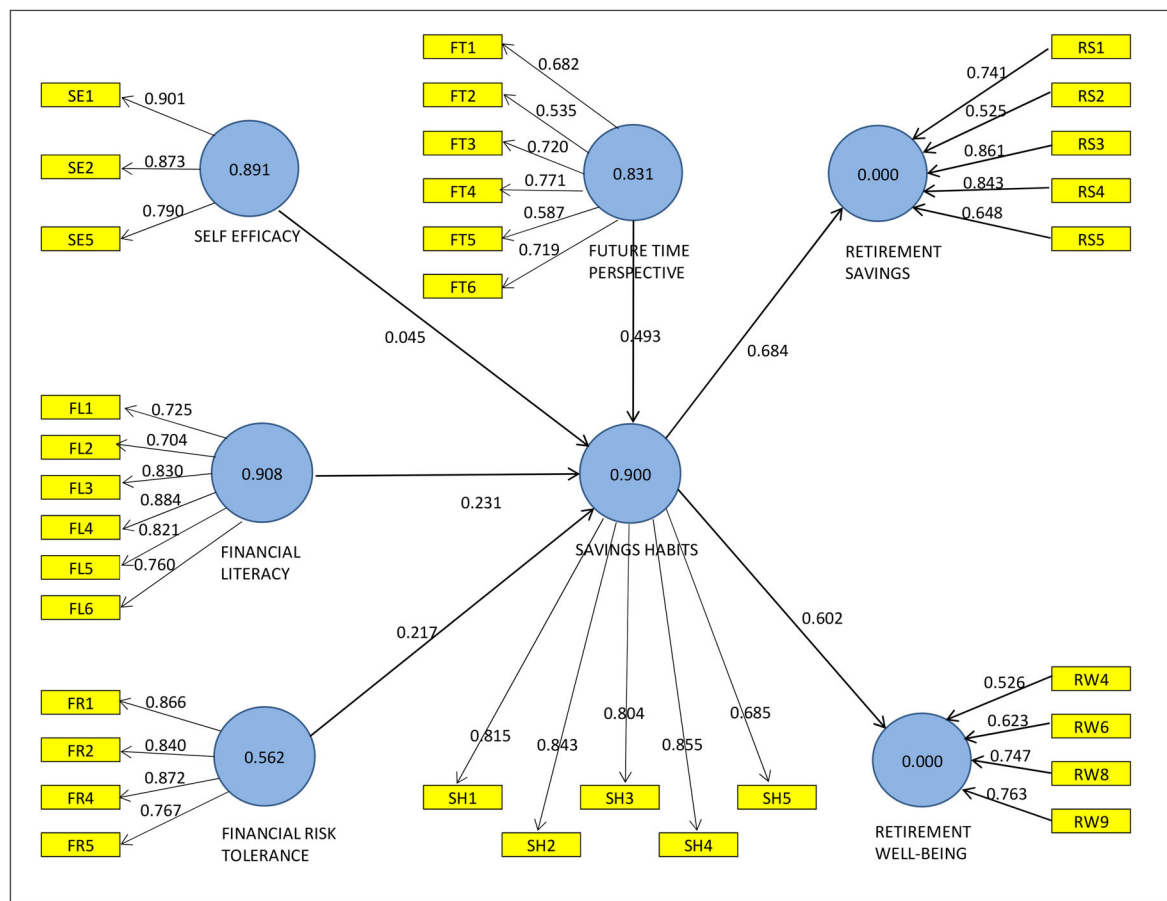


Figure 3. Formative measurement model.

Table 4. Hypothesis testing.

Hypothesis	Relationship	Std Beta	Std Error	t-value	Decision	R ²	f ²	Q ²	q ²
H ₁	FL → SH	0.231	0.042	5.541	Supported	0.523	0.109	0.328	0.048
H ₂	FR → SH	0.217	0.048	4.524	Supported		0.061		0.025
H ₃	FT → SH	0.493	0.058	8.505	Supported		0.240		0.107
H ₄	SE → SH	0.045	0.068	0.658	Not supported		0.002		0.000
H ₅	SH → RS	0.684	0.033	19.880	Supported	0.441	0.790	0.242	0.242
H ₆	SH → RW	0.602	0.034	17.303	Supported	0.337	0.508	0.144	0.144

Note. ** $p < 0.01$, * $p < 0.05$.

Retirement Well-Being indicate that Savings Habits ($\beta = 0.684$, $p < 0.01$) and ($\beta = 0.602$, $p < 0.01$), respectively, are positively related to Retirement Savings and Retirement Well-Being. Hence, this explains 41.1% and 33.7% of the variances in both Retirement Savings and Retirement Well-Being. Consequently, these results support H₂ and H₃; however, H₄ is not supported because the t-value was less than 1.96.

4.3. Factor loadings (indicator reliability/outer loading)

Examining the factor loadings related to indicator reliability (or outer loadings), we find that loadings greater than 0.708 suggest that the latent variables can explain at least 50% of the indicator's variance. Loadings of 0.4, 0.5, 0.6 and 0.7 are also acceptable if the average variance extracted is greater than 0.5 and 0.6, respectively (Byrne, 2016; Hulland, 1999).

Some researchers state that loading values of 0.7 or higher (Hair et al., 2010) or 0.708 and above (Hair et al., 2017) indicate that a latent variable explains at least 50% of the indicator's variance. In this study, all loading values are within the indicator's variance, which is greater than 0.5 or 0.708 (Table 5). Items RW1, RW2, RW5, RW7, SE3, SE4, and SH6 were deleted, due to loadings falling below the threshold

Table 5. Measurement model/factor loadings.

Construct	Items	Loadings	AVE	CR
Financial literacy	FL1	0.725	0.624	0.908
	FL2	0.704		
	FL3	0.830		
	FL4	0.884		
	FL5	0.821		
	FL6	0.760		
Financial risk tolerance	FR1	0.866	0.701	0.903
	FR2	0.840		
	FR3	−0.654		
	FR4	0.872		
	FR5	0.767		
Future time perspective	FT1	0.682	0.454	0.831
	FT2	0.535		
	FT3	0.720		
	FT4	0.771		
	FT5	0.587		
	FT6	0.719		
Retirement savings	RS1	0.741	0.539	0.850
	RS2	0.525		
	RS3	0.861		
	RS4	0.843		
	RS5	0.648		
Retirement well-being	RW1	−0.198	0.457	0.805
	RW2	−0.120		
	RW3	0.000		
	RW4	0.526		
	RW5	−0.196		
	RW6	0.623		
	RW7	−0.153		
	RW8	0.747		
	RW9	0.763		
Savings habits	SH1	0.815	0.645	0.900
	SH2	0.843		
	SH3	0.804		
	SH4	0.855		
	SH5	0.685		
	SH6	0.029		
Self-efficacy	SE1	0.901	0.733	0.891
	SE2	0.873		
	SE3	0.230		
	SE4	0.321		
	SE5	0.790		

of 0.708. However, some items with loadings below 0.708 were retained because they provided significant contributions to the study.

4.4. Average variance extracted (AVE)

The average variance extracted (AVE) ranges from 0 to 1 and represents the ratio of total variance that is due to the latent variable. An AVE value of 0.5 or greater indicates satisfactory convergent validity, which means that the latent construct accounts for 50% or more of the variance within the observed variables, on average. However, the AVE for the constructs of the Future Time Perspective and Retirement Well-Being are 0.454 and 0.457, respectively, which are less than the value of 0.5. Hence, the measurement error is greater than the variance captured by the construct and the validity of the individual indicator. The AVE is a more conservative measure, as compared to the composite reliabilities.

The results reveal that the convergent validity of the construct is adequate and acceptable, as only 28% (Note that the 28% is derived from the 2/7 constructs in that their AVE is less than 0.5 (i.e. $2/7 \times 100\% = 28.5$ or close to 28%)) of the variance is due to the error (i.e. future time perspective, retirement well-being). The AVE values are 0.454 and 0.457. This is consistent with some research findings, which suggest that even if more than 50% of the variance is attributed to the error, the convergent validity of the construct can still be considered adequate and acceptable (Malhotra & Dash, 2011).

Table 6. Discriminant validity using Fornell and Larcker criterion.

	Financial literacy	Financial risk tolerance	Future time perspective	Retirement savings	Retirement well-being	Savings habit	Self-efficacy
FL	0.790						
FR	0.094	0.837					
FT	0.055	0.463	0.674				
RS	0.339	0.298	0.594	0.734			
RW	0.143	0.441	0.628	0.589	0.676		
SH	0.254	0.384	0.663	0.659	0.580	0.803	
SE	0.072	0.432	0.668	0.581	0.581	0.476	0.856

4.5. Discriminant validity

The discriminant validity of the model was also assessed. The indicators should load more strongly on their own constructs than on other constructs within the model. Additionally, the average variance shared between the construct and its measures should be greater than the variance shared between the construct and the other constructs (Henseler et al., 2015). Table 6 illustrates that all constructs meet the criteria for sufficient and satisfactory discriminant validity, with the square root of the AVE (shown on the diagonal) being larger than the correlations (off-diagonal) for all reflective constructs (Roldan & Sanchez-Franco, 2012).

Discriminant validity measures the degree to whereby items representing a particular construct are differentiated from other constructs in the study. Discriminant validity is measured using three (3) methods: 1) the Fornell and Larcker criterion, 2) heterotrait-monotrait ratio of correlations (HTMT) technique, and 3) cross loadings (Hair et al., 2011; Henseler et al., 2009; 2015). To achieve acceptable discriminant validity, based on the Fornell and Larcker criterion, indicators should load more strongly on their own constructs. The AVE values for a construct and its measures should be greater than the squared correlations with the other latent constructs (Roldan & Sanchez-Franco, 2012).

During this process, we carefully evaluated the consistency of the PLS model, considering whether to eliminate or delete indicators with low reliability (Henseler et al., 2009). Subsequently, this will substantially increase the AVE and composite reliability (Henseler et al., 2009). Thus, in the second loading process, all indicators were retained, as their loading values were favourable and acceptable within the indicator's variance.

5. Discussions

5.1. Relationship between financial literacy and savings habits

The first objective of this study is to examine the relationship between society's financial literacy (FL) and savings habits (SH). To achieve the primary objective, H_1 was tested, which predicts a positive relationship between FL and SH, using PLS-SEM. The results confirm a significant relationship between the 2 constructs (i.e. FL and SH), indicating that H_1 is supported. The significant positive relationship between FL and SH implies that, as long as the society or the individual is financially literate, their SH will increase, as they are more prone to understand that savings is important to them.

A higher level of the individual FL results in a higher level of SH and vice-versa. The results for H_1 , with a beta coefficient score of 0.231 and a t-value of 5.541, is greater than 1.96 (two-tailed test) at the 0.05 or 5% level of significance. This reveals that FL contributes to the SH among the society in Sarawak.

The significant positive relationship finding between FL and SH is in line with, and supports, the findings in Huston (2010), Agarwal et al. (2011), and Widjaja et al. (2020). These studies reveal that financial literacy is a measurement of how well individuals understand and utilise their personal finances. It also refers to their ability to avoid making welfare-reducing decisions, such as failing to refinance mortgages effectively.

5.2. Relationship between financial risk tolerance and savings habits

To examine the relationship between financial risk tolerance (FR) and saving habits (SH) of individuals who fall under the first objective of this study, we propose H_2 , which predicts a positive relationship

between FR and SH. We tested H_2 using PLS-SEM. As predicted, we found a significant relationship between these 2 constructs (i.e. FR and SH), demonstrating that H_2 is supported.

Our findings reveal that a higher level of FR results in a higher level of SH in society, and vice versa. The results for H_2 show a beta coefficient score of 0.218 and a t-value of 4.524. This value is greater than 1.96 (two-tailed test) at the 0.05 or 5% level of significance, indicating that FR contributes to SH among the society in Sarawak.

The significant positive relationship between FR and SH supports the studies by Yao et al. (2011). These studies reveal that individuals with poor financial literacy have a different understanding of FR compared to those with adequate financial literacy. Additionally, Huhmann and McQuitty (2009) disclosed that financial literacy complicates understanding financial concepts, and that FR and financial risk scores are associated with one another.

Overall, the significant relationship between FR and SH demonstrates how an individual's risk tolerance affects their ability to make sound financial decisions, allowing them to choose the most beneficial options (Singh et al., 2022).

5.3. Relationship between future time perspective and savings habits

To examine the relationship between the future time perspective (FT) and the saving habits (SH) of individuals who fall under the first objective of this study, we tested H_3 , which predicts a positive relationship between FT and SH. This was done in line with PLS-SEM. As predicted, there was a significant relationship between these 2 constructs (i.e. FT and SH). Therefore, H_3 is supported.

Based on these findings, a higher level of FT results in a higher level of SH among society, and vice versa. The results for H_3 show a beta coefficient score of 0.493 and t-value of 8.505, which is greater than 1.96 (two-tailed test) at the 0.05 or 5% level of significance. This reveals that FT contributes to the SH among the population in Sarawak.

The significant positive relationship between FT and SH is supported by studies such as Jacobs-Lawson and Hershey (2005), Hershfield et al. (2011), and Setiawan et al. (2022). These studies indicate that individuals' past, present, and future selves affect their savings habits.

5.4. Relationship between self-efficacy and saving habits

To meet the primary objective of this study, H_4 , which predicts a positive relationship between self-efficacy (SE) and saving habits (SH), was tested using PLS-SEM. However, the results indicate no significant relationship between these 2 constructs (i.e. SE and SH). Therefore, H_4 is not supported. More specifically, the results at H_4 showed a beta coefficient score of 0.045 and a t-value of 0.658, which is less than 1.96 (two-tailed test) at the 0.05 or 5% level of significance. This suggests that SE does not contribute to the SH among the population in Sarawak.

Despite these findings, most studies have revealed that SE can improve SH, as individuals with higher self-efficacy are better able to prepare emergency funds and manage their personal finances for the future. Research by Putri and Hamidi (2019) and Asriyani and Johan (2023) and Isa and Daukin (2023) supports this view. Thus, the insignificant negative relationship between SE and SH in this study suggests that further research is needed, given that most studies found a significant relationship between SE and SH.

5.5. Relationship between savings habits and retirement savings

The second objective of this study is to examine the relationship between saving habits (SH) and retirement savings (RS) in society. To achieve this objective, H_5 , which predicts a positive relationship between SH and RS, was tested in line with PLS-SEM. As predicted, there was a significant relationship between these 2 constructs (i.e. SH and RS), demonstrating that H_5 is supported. The significant positive relationship between SH and RS indicates that, as long as populations or individuals cultivate and instil SH, their RS will also increase, as they recognise the importance of saving for retirement and old age.

The results suggest that a higher level of SH leads to a higher level of RS among the population, and vice versa. More specifically, the results for H_5 show a beta coefficient score of 0.664 and t-value of

19.880, which is greater than 1.96 (two-tailed test) at 0.05 or a 5% level of significance, revealing that SH contributes to RS among the society in Sarawak.

The finding of a significant positive relationship between SH and RS is in line with and supported by Fisher and Anong (2012) and Bongini and Cucinelli (2019). They revealed that savings habits are associated with the possibility of savings for retirement and that, by having savings for emergencies will boost their chance of having regular savings as well. In short, the money management positively influences their intention to invest in a retirement fund.

5.6. Relationship between savings habits and retirement well-being

The third objective of this research investigation is to examine the relationship between the savings habits (SH) and retirement well-being (RW) of a population. To achieve this objective, H_6 , which predicts a positive relationship between SH and RW, was tested using PLS-SEM. As predicted, a significant relationship was found between the 2 constructs (i.e. SH and RW), confirming that H_6 is supported. The significant positive relationship between SH and RW indicates that, when populations or individuals cultivate and instil SH, their RW also improves, as they understand the importance of savings for retirement and their overall well-being.

These findings suggest that a higher level of SH leads to a higher level of RW within the population, and vice versa. More specifically, the results for H_6 show a beta coefficient score of 0.580 and a t-value of 17.303, which is greater than 1.96 (two-tailed test) at the 0.05 or 5% level of significance, revealing that SH contributes to RW among the population in Sarawak.

The significant positive relationship between SH and RW is supported by Quick and Moen (1998), Wang (2007), and Barrett and Kecmanovic (2012), who found that individuals who are well-prepared and have planned ahead by practising savings habits are more likely to enjoy greater well-being in retirement. The significantly positive results also align with the previous literature that has identified a connection between perceived financial capability and financial well-being, with confidence being strongly associated with both subjective financial well-being and positive financial behaviours (Atlas et al., 2019; Fan & Henager, 2022). Furthermore, retirement well-being is closely linked to the steady stream of retirement savings, contributing to overall happiness in later life.

6. Conclusions and further research recommendations

While traditional methods of measuring spending behaviour (e.g. surveys), offer valuable insights into savings habits, they are inherently susceptible to behavioural biases that can compromise the accuracy of the data obtained. A significant limitation arises from the presence of cognitive biases, such as memory recall bias and social desirability bias, which can disrupt respondents' self-reported spending data. For example, individuals may struggle to accurately recall all their expenditures over a given period of time, leading to underreporting or misrepresentation of spending habits. Additionally, respondents may feel pressure to conform to societal norms, leading to the underreporting of discretionary spending or the overestimation of savings. These biases can result in skewed data that may not accurately reflect individuals' true spending behaviour, thereby impeding the reliability and validity of the measurements derived.

Quantifying saving and spending habits can be challenging as they can vary widely between individuals and cultures. Both saving and spending habits are components of overall financial budgeting behaviour. Individuals who are disciplined savers may also be cautious spenders, and vice versa. This overlap in behaviour can make it challenging to study these behaviours independently. By acknowledging and addressing these gaps, we anticipate that future research should consider adopting and building upon our findings, continuing to pave the way for more robust and comprehensive research in this field of study.

This research focuses on excluding demographic variables from the analysis due to their perceived lack of direct relevance to primary research questions and hypotheses. This decision aims to maintain clarity and analytical focus. By omitting demographics, the study seeks to prioritise simplicity and statistical power, avoiding the complexities introduced by interactions and subgroup analyses. However, it

acknowledges that demographic variables (e.g. age, gender, race or ethnicity, socio-economic status) can influence study outcomes and introduce bias, if not accounted for. This exclusion is recognised as a limitation that may impact the generalisability and reveal hidden relationships in the data, which should be addressed in future research.

Disclosure statement

No potential conflict of interest was reported by the author(s).

About the authors



Suzie Adeed, Ph.D., has a comprehensive background in economics particularly in behavioural economics, finance, savings principles, complemented by a focus on well-being and habits. Her contributions as a peer reviewer have included identifying novel methodologies and providing constructive feedback that enhances the rigour and impact of academic research. Her research has been published in reputable journals, reflecting her commitment to advancing knowledge in her field. In her role in human resources management, she applies her interdisciplinary expertise to foster collaboration and drive project success. Her professional development in peer reviewing underscores her dedication to staying at the forefront of academic discourse and contributing meaningfully to scholarly publications.

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