The Role of Financial Literacy and Individual's Behavioural Beliefs in Predicting Retirement Savings in Malaysia

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Abstract

This paper investigates on how different level of financial literacy interacts with retirement savings in Malaysia. Alongside, the study adds mediating variable of individual behavioural beliefs, which focuses on public and private employees' intention to accumulate regular savings for an old-age provision. The significant factors have found between advanced financial literacy and retirement savings, with the mediating effect of behavioural beliefs for that association. However, basic literacy has no sufficient impact, so does the mediating effect to support the outcome variable. Several implications have emerged: government and stakeholder's involvements in intensifying financial educational programmes exclusively for advanced capital markets and strategic investment, offering more alternative retirement savings and investments portfolio with a higher potential growth of product, and by constantly promoting individual's salient beliefs notably for those with an advanced literacy and propensity to save and invest for retirement adequacy.

Keywords: *basic financial literacy, advanced financial literacy, retirement savings, behavioural beliefs, defined contribution, defined benefit*

1.0   Introduction

Retirement savings is one of the key issues that attract global attention for its ability to drive financial economic stability and social protection while pursuing retirement. Malaysia as an emerging market is always strived to improve the quality of the welfare and well-being of the people in line with the progress in various targeted areas. One of these is to provide resilient retirement protection especially to ensure that retirees will have a quality and perfect life once they terminate their service permanently.

Recent developments have shown a transition of retirement scheme from Defined Benefit (DB) government pension scheme towards Defined Contribution (DC) for private sector pension scheme (Benartzi & Thaler, 2007; Marsden, Zick, & Mayer,

2011). According to Employee Benefit Research Institute [EBRI] (2015), there is a significant increase on percentages of employees participating in DC scheme from 67% in 1975 to 93% in 2006. Malaysia has also began to consider the DC scheme as an initiative to reduce the burden of RM300 billion liability that the government has to bear (Nambiar, 2016). The DB scheme is unable to maintain its good performance over a long period of time, thus a proposal has been made to replace it with a scheme similar to DC Scheme. The world of DB is practically abolished and being taken over by DC especially in private sectors. The transition thus puts pressure, especially employee's responsibility to make additional savings in addition to the mandatory scheme for their retirement adequacy.

Previous findings have shown that the majority of Malaysians failed to save. The average of household savings rate is only 1.4% from adjusted disposable income, far behind European Union (4.7%), United States (5%), Korea (5.6%), Chile (9.8%), and neighbouring country Thailand (4.5%) (Suppakitjarak & Krishnamra, 2015; Khazanah Research Institute [KRI], 2016). Almost 90% of the rural and 86% of the urban population are burdened by debt (Shagar, 2016). Household debts in 2016 stood at 89.9% of Gross Domestic Product and among the highest in Asia (Teng, 2016). By 2045, people aged 60 and above are expected to overpower the 15-year-olds (Asher, 2012). Malaysian's life expectancy is also increased to 75 years and they have at least 15 years post-retirement life (Department of Statistics Malaysia [DOS], 2015). Unfortunately, the World Bank's targeted replacement rate of 66% - 75% or a minimum of RM228 thousand for EPF is too high compared to the actual achievement of the majority of Malaysians. Almost 68% of EPF contributors have savings of less than RM50 thousand (BERNAMA, 2016). It is even more concerning as the previous study also found that 99.9% of employees withdraw all their accumulated savings upon retirement, and 70% of them will spend the entire of amount within three to five years after retirement (Hunt, 2009).

One of the factors that have been identified as the driving force behind retirement preparations worldwide is financial literacy. Most of the literatures have suggested that there are significant relationship between financial literacy and retirement plans (Lusardi, 2001, 2003; Lusardi & Mitchell, 2007; Yoong, See, & Baronovich, 2012). Those with lowest literacy tend to face various social problems, live in poverty, face bankruptcy, be fraud victims, and fail to have financial plan and render them most vulnerable to economic hardship in retirement (Lim et al., 2013; Sabri & Juen, 2014). They also failed to have profitable savings and investment decisions (Lusardi & Mitchell, 2007), having loans with high interest rates (Rooij, Lusardi, & Alessie, 2007), and poor on assets and financial management (Maina, 2013). They act passively and refuse to take into account some money-saving concepts and fundamentals of investment, thereby negatively affecting retirement plans and other financial

decisions (Moorthy et al., 2012). As such, study should be made to ascertain the actual performance of individuals and households financial literacy in developing country such as Malaysia.

This paper examines the relationship between financial literacy and retirement savings amongst public and private sectors in Malaysia. It is an important issue that implies how literacy can help people to make informed decisions on financial circumstances and future plan. To gain better insight, this study benchmarked financial literacy basic and advanced levels and measured based on the respondent's ability to correctly answer the given questions and summed up for analysis and hypotheses confirmations. In addition, this study further examined the extent of behavioural beliefs in predicting saving intention directly or indirectly through mediation role of the association. According to Ajzen (1991), salient beliefs plays an important factor that leads to favourable or unfavourable evaluation or appraisal of the behaviour in question. Therefore, the objectives of this research are to understand the relationship of financial literacy (IV) and retirement savings (DV), and to examine the extent to which an individual's behavioural belief acts mediate the association between IV and DV respectively.

2.0   Literature Review

Financial literacy can be defined as an "ability to make informed judgements and to take effective decisions regarding the use and management of money" (Schagen & Lines, 1996, p. ii). It measures individual's capability in applying financial management and closely related to education that starts with the individual's positive intention to learn. Literacy serves as the basic skill for individuals to remain competitive in an increasingly modern technological and community environment involving the evaluation process as well as profitable decision makers (The Social Research Centre, 2008).

Schagen dan Lines (1996) stated that the three fundamental parts in financial literacy are planning, problem-solving, and decision-making. Individuals who are able to master it all are easier to understand the key concepts of money management in terms of receiving, consuming, saving, and investing. Being able to serve in organizations involving financial services, having broader general or specific skills, as well as attitudes that enable individuals to make decisions and be more responsible to the decisions that have been made could also help the individuals to have better understanding. This opinion is in line with the classical economic approach, which stated that financial literacy will act as 'check and balance' that prevents any abuse and fraud especially in buying and selling transactions. For example, individuals with information and know how to calculate interest rate, able to understand financial

agreements, aware of investments risk and sale transactions that are likely to occur even if not clearly stated, usually conduct evaluation and decision-making process according to the needs and the best choice that makes it difficult for sellers to commit fraud or gain excessive profits by fraud. Individuals who are more experienced and have the highest literacy possess higher ability to assess, manage and discuss current issues and financial environment that directly impact both the daily and the long-term benefits.

A series of research was conducted to assess the extent to which the role of financial literacy in influencing retirement planning, as well as the government's strategies in empowering financial and economic fiscal policies. Among these are Lusardi and Mitchell's (2005, 2007, 2008, 2011), by using a set of questionnaires dedicated to some developed and developing countries worldwide. Three questions were developed to assess the level of individual knowledge that was designed using a special module that was appropriate for assessing and comparing the level of literacy individually or involving the country. The findings show that the level of financial literacy in most countries is low and unsatisfactory. Despite the significant relationship between academic achievement and financial knowledge, the level of financial literacy is still low. Meanwhile, only a few households are able to answer two questions about interest rates and inflation. They comprised of groups that are expected to have an economic advantage and more comfortable standard of living in the old days. Majority of them are still unaware of the various programmes of good practice as well as the promotion of savings and investment products offered by government agencies. This weakness poses negative implications especially among vulnerable sub-groups such as the low income households, minorities, and women.

One of the empirical findings of Lusardi and Mitchell (2007) is the role of financial literacy that affects the individual's decision to have a perfect future preparation plans. Positive relationships between literacy and retirement plans encourage households to save money and accumulate wealth (Rooij et al., 2011). Those with retirement plans are psychologically encouraged to self-control either by increasing their economic capacity or making changes in their spending behaviour. Self-control allows individuals to be more disciplined and continue to focus on retirement plans that have been set earlier. The finding was in line with 2004 and 2006 bi-monthly surveys under the JumpStart, which found that the majority of the population still had literacy levels below the standard requirement (Mandell, 2008). Most individuals have failed to answer basic questions especially in personal money management, stocks, bonds, and some investment instruments (Mandell, 2008). This decision on future preparation plan is not much different from most developed and developing countries whereby this shows a low level of affection. The study of Ali, Rahman, and Bakar (2015) also found that most of respondents only had a basic literacy

level and had difficulty responding to questions regarding accumulated benefits and subsequently failing to assess the risks of credit card debt. Results are in line with some past researches such as Yoong, See, and Baronovich (2012b), Brahmana, Puah, Hla, and Lestari (2012), Sang et al. (2013), Mahdzan and Tabiani (2013), and Sabri and Juen (2014).

Brahmana et al. (2012) have found the difference of relationship between basic and advanced financial literacy and retirement plan. The study indicates that there is an association between retirement plans and advanced literacy, compared to basic level that tends to act passively and has no savings or specific future plans. According to Rooij et al. (2011), variants of the decision-making process occur between households with basic literacy, as opposed to those with advanced level who have the skills of financial instruments such as stocks, bonds, and risk diversity strategies that are more positive and involved with the stock market. A persons with higher financial literacy are more favourable towards risk perception, having more positive attitude on financial investments, and behavioural intention to invest (Lim et al., 2018). They, the advanced level, seek financial advice from professional consultants rather than relying solely on sources of family information, friends, and acquaintances. One of the issues that make the difference in selection results by basic or advanced level is due to the role of literacy that acts either by measuring the ability of knowledge in selecting, or cognitive ability to function logically. Brahmana et al. (2012) stated that basic literacy only refers to the cognitive ability rather than skill that assesses the individual's financial knowledge. Questions regarding the calculation of interest rates, inflationary effects, or the after-sale discount are also common and only test the cognitive abilities of simple mathematics, rather than the more complex advanced literacy and need to be solved through extensive knowledge.

Beside financial literacy, behavioural belief is also an important factor that encourages individuals to demonstrate certain behaviours. Various researchers have emphasized the importance of behavioural beliefs in determining the level of satisfaction and individual financial behaviours (Lindqvist, 1981; Millar & Deyonish, 2009; Davis & Hustvedt, 2012). Those with positive attitude and good financial perceptions typically have plans and controls and tend to achieve financial satisfaction. For example, individual's subjective perceptions on various issues involving personal financial management in terms of income, expenditure, savings, and investment strategies will have an impact in building financial satisfaction as well as risk tolerance to be sub-constructive behavioural beliefs through a broad financial context (Joo & Grable, 2004). Attitude is formed through an effective strategy that can encourage individual's positive perceptions of a matter (Bandura, 1999). Those who have positive attitudes will consistently act in parallel with intention and behaviour. Whereas, those with negative attitudes will be more passive, less motivated, and most probably will fail

to reach the intention and behaviour accordingly. Understanding the mediation effect of behaviour attitude between financial literacy and individual savings for retirement is an important factor due to determination or execution of behaviour is often entirely dependent on the individual's own attitude.

This research has threefold contribution. Firstly, it was made specifically to look on how financial literacy can influence individual's retirement savings solely rather than element of retirement planning which consists of four disciplines such as implementing saving, identifying sources of income, estimating expenses, and managing assets. This is important because adequate supply of money is a major component that becomes a decisive factor for a perfect retirement plan. Secondly, this study distinguishes the role of financial literacy in two levels, namely basic and advanced, which is different from the assessment method used by Lusardi and Mitchell (2005) before. The level of literacy is divided into two to see how far it can act on retirement savings, and further find out whether the level of literacy owned by most Malaysians is adequate or still need to be enhanced. Finally, this study will introduce behavioural beliefs as an independent variable and mediation role for retirement savings to make it more logical by taking consideration on human's strengths and weaknesses involving their own perception and willingness on fulfilling certain behaviours. Thus, it will be a benchmark for future studies.

3.0   Methodology

This study emphasized on purposive sampling survey technique among working individual in the public and private sectors in Malaysia, regardless of their DB or DC mandatory scheme, as well as educational background, gender, age, and employment designation. This technique is considered most practical and widely used in the field of social sciences, convenient information disclosure, broader potential respondents, user-friendly, economical, and can be generalized from sample to population (Creswell, 2014). A total of 350 self-administered questionnaires were distributed across different cities in Federal Territory of Kuala Lumpur, Selangor, Sabah, and Sarawak. The drop-off and collect method was employed, whereby the researcher or a representative hand-delivered each survey to prospective sample, and every completed response was collected directly or through a collection box as provided. Preliminary inspection on data completion (missing data), face and content validity, normality, outliers, and common method variance were conducted prior to primary statistical analysis requirements. As a result, this study recorded 200 successful completed and usable forms, indicating 57% of total response rate.

Measurement of Variables

This study employed two independent variables (IV) of Basic Financial Literacy (FLB) and Advanced Financial Literacy (FLA), a mediating variable (Med) of Behavioural Beliefs (BEH) that explaining the relationship between IV and the dependent variable (DV) of savings for retirement (SAV).

Retirement Savings (SAV)

This study chose retirement savings (SAV) as the dependent variable (DV) by developing four questions-based formative Ajzen's (2010)naloxone tended to enhance the increase in the power of the intermediate alpha EEG (9.4-10.4 Hz guideline on how to compose reliable and valid items on predicting individual's intention towards behaviour.

According to Ajzen (2010), behaviour in question should be designed to directly measure a given construct, and should be defined clearly in terms of its purpose, target, time elements, and context. Therefore, this study will assess retirement savings (SAV) based on respondent's willingness to save their salary (purpose) for a minimum 10% (target) of their monthly salary (time elements) for retirement purposes (context). Respondents are required to state their level of consent in relation to several aspects: (I) intention to save a minimum 10% of their salary, (II) any plans for retirement savings, (II) their expectation of retirement savings, (II) motivated to save in the near future, and (IV) intent to have a perfect life during their retirement days. The reliability test of SAV has recorded an acceptable Cronbach's Alpha of 0.800, which exhibited an optimum index which is normally recommended for internal consistency (Nunnally, 1978).

Financial Literacy

The first independent variable (IV) of this study is financial literacy. It consisted of 12 direct measurement questions which were adopted from Mandell (2008), Rooij et al. (2011), and Ali et al. (2014)which requires well strategized economic behaviors over one's life cycle. Furthermore, financial satisfaction can describe an individual's perception concerning his/her current financial situation. In this study, we developed and tested a conceptual model to predict the level of financial satisfaction among Malaysian working individuals. Specifically, the model explains how financial planning (FP. Items were made by using an extensive list of questions that aimed to measure different levels of financial literacy and decision-making process.

Each question was divided into two major categories and set up accordingly from a basic literacy that deals with daily transaction and simple decision-making process (numeracy, percentage, inflation, electronic transaction, money illusion, and financial intermediary), to an advanced measurements question that deals with more complex financial instruments (market shares and mutual fund characteristics, investment returns, risk diversifications, compound interest, and differences between stock and bond). Every question provided three to five answers and respondents were asked to choose only single answer that they think is most accurate. Each correct answer will score one (1) point, while incorrect answer will not contribute any score (0). Each point will be summed up within each category accordingly and will be further analysed the extent of positive or negative relationship between both basic (FLB) and advanced (FLA) financial literacy towards retirement savings (SAV).

Behavioural Beliefs (BEH)

The other independent variable is behavioural beliefs (BEH) which found to be the best predictor with a high degree of accuracy to anticipate behavioural intentions. It refers to the "degree to which a person has a favourable or unfavourable evaluation or appraisal of behaviour in question" (Ajzen, 1991, p. 188)1985, 1987.

This study divided BEH into: (I) behavioural belief that represents the possibility of behaviour will act subjectively to produce an expected result, and (II) outcome evaluation on how worthwhile an individual to consider the outcome of the behaviour. Furthermore, six measurement items were formulated based on Ajzen's (1991)1985, 1987 and Francis et al.'s (2004) theories that comprised of three items for behavioural belief (usefulness, good practice, and enjoyment) and outcome evaluations (excitement, awareness, and overall opinion). To achieve the target, this study employed seven-point bipolar adjective measurement scales with endpoints of minimum "1" to represent "completely disagree", and maximum "7" for "completely agree". In other words, BEH performed two functions, in assessing direct effect towards SAV and the role of mediation indirect effect between FLB and FLA on SAV as dependent variable. Overall, all items have shown a good reliability consistency with Cronbach's Alpha of 0.852, thus indicated higher mean of ATT scores.

Hypotheses Development

In summary, there are four hypotheses to be tested between IV (FLB, FLA, and BEH) and DV (SAV). First, the study hypothesized that individuals with an advanced literacy and familiar with stock, bonds, and forefront markets are motivated to have better old age, will have a positive behavioural beliefs and will save their income for retirement benefits. At the same time, respondents who have basic financial knowledge that related

to day-to-day activities are also have behavioural beliefs and inspired to save and positively related to retirement savings. Third, behavioural beliefs plays significant role in establishing behavioural belief and positive outcome evaluation to influent individual's retirement savings. In addition, this study posits that behavioural beliefs will mediate a relationship of financial literacy and retirement savings. Hypotheses can be broken into details and theoretical framework as follows:

H_1: There is a positive relationship between FLB and SAV (+).
H_2: There is a positive relationship between FLB and BEH (+).
H_3: There is a positive association between FLA and SAV (+).
H_4: There is a positive association between FLA and BEH (+).
H_5: BEH is significant related to SAV (+).
H_6: BEH mediate a relationship between FLB and SAV (+).
H_7: BEH mediate a relationship between FLA and SAV (+).
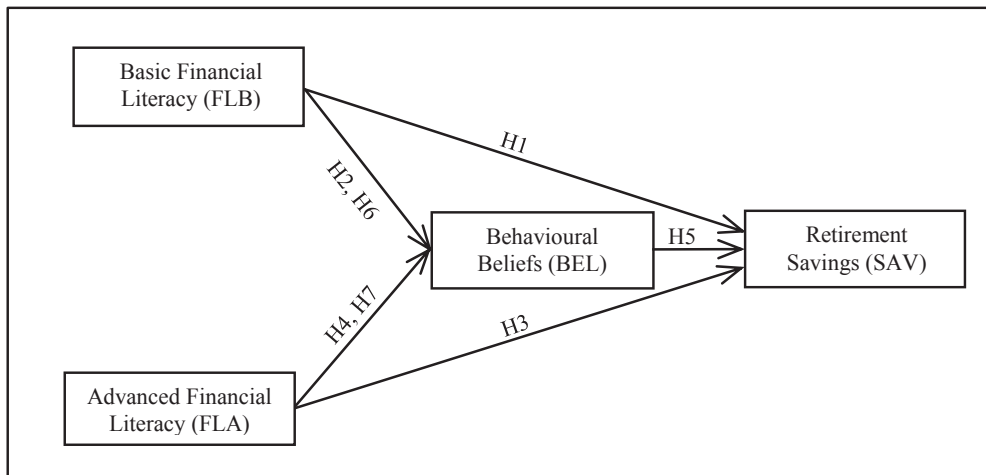

Figure 1 Theoretical framework

4.0   Findings

Based on 200 usable questionnaires, female's was slightly more than male's populations. With an age compositions ranged from 22 to 59 years (mean 36), and 68% of them were 40 years old and below. Most of them are married (69%), singles (21.5%), and others (9.5%). As for educational level, 17.5% of them were PhD/ masters' holders, 40.5% degrees, 22% diplomas or secondary school certifications, and 20% other qualification. Furthermore, majority (55.5%) were support staff, 34% executive, and 10.5% top management. Results have also shown that 59.5% of them were among who chose DC rather than DB scheme (40.5%), and clearly indicated the favourable

pattern of DC retirement selections scheme, and in line with the previous findings of Benartzi and Thaler (2007), Marsden et al. (2011), and EBRI (2015). Summary of respondents' socio-demographic profile obtained from the distributed questionnaires is as shown in Table 1.

Table 1 Summary of respondents' profile

		Total (n = 200)	Frequency (%)
Gender	Male	95	47.5
	Female	105	52.5
Age	30 years and below	70	35.0
	31 – 40 years old	66	33.0
	41 – 50 years old	42	21.0
	51 years and above	22	11.0
Marital status	Single	43	21.5
		138	69.0
	Married	19	9.5
	Others		
Educational level	PhD	6	3.0
	Master degree	29	14.5
	Bachelor degree	81	40.5
	Diploma/ secondary school	44	22.0
	Other qualification	40	20.0
Position	Top management	21	10.5
	Executive	68	34.0
	Support staff	111	55.5
Retirement scheme	Defined benefit (DB)	81	40.5
	Defined contribution (DC)	119	59.5

Measurement Model Analysis

SmartPLS was used to assess complex cause-effect relationship model between observed data and latent variables as shown in Table 2. PLS algorithm was run with standardized path weighting scheme, 300 maximum iterations, and stop criterion (10^-7^) to predict internal consistency reliability, convergent validity, and discriminant validity.

The reflective indicator and Cronbach's alpha for both BEH and SAV were robust in term of their outer loading consistency between $0.62 – 0.85$ and $0.80 – 0.85$. Despite there are no items for discarded since it had exceeded a minimum loading of 0.50 and 0.70 as recommended threshold for a valid measurement (Hulland, 1999; Nunnally, 1978). The highest load is on SAV4 with 0.85 as it deals with an intention to have an ideal life during retirement, and the lowest 0.62 was on BEH1 due to previous findings that most Malaysians are having mixed opinion and feeling unreliable on regular savings. The convergent reliability of the construct was assessed by comparing

the square root against its bivariate correlations between each constructs in Average Variance Extracted (AVE). The grand mean value of indicators squared loadings associated with the construct had indicated an average scores of 0.55 (BEH) and 0.58 (SAV), which is considered as an acceptable value of higher than 0.50 and explained more than half of the variance of its indicators (Fornell & Larcker, 1981).

Internal consistency from composite reliability (CR) recorded values of 0.88 (BEH) and 0.85 (SAV), greater than 0.70 to demonstrate an adequate consistency (Gefen, Straub, & Boudreau, 2000). Finally, the discriminant validity has been established with cross-loadings value that is less than indicator's construct outer loading, valid Fornell-Larcker criterion with a larger AVE compared to the squared correlation within the construct, and impeccable Heterotrait-monotrait (HTMT) ratio with a maximum point of 0.54 that below 0.85 critical value, and additional bootstrapping HTMT upper confidence interval with a score below of 1.00. Therefore, it justify all correlations are not perfectly measured and constructs were empirically unique and not overlapping or represented by each other.

Table 2 Assessment on measurement model

		Items	Loadings	AVE	CR	Rho_A
1.	Financial literacy (Basic)	FLB	1.000	1.000	1.000	1.000
2.	Financial literacy (Advanced)	FLA	1.000	1.000	1.000	1.000
3.	Behavioural beliefs	BEH_1	0.623	0.553	0.880	0.852
		BEH_2	0.798			
		BEH_3RC	0.809			
		BEH_4	0.724			
		BEH_5	0.776			
		BEH_6	0.716			
4.	Savings for retirements	SAV_1	0.715	0.584	0.849	0.800
		SAV_2	0.675			
		SAV_3	0.808			
		SAV_4	0.852			

Structural Model Analysis

The study utilized bootstrapping technique with 500 sub-samples, Bias-corrected Accelerated (BCa), and one-tailed sample at 0.05 significant level. Result has shown that the inner Variance Inflation Factor (VIF) values is lower than 5.0 (BEH = 1.0 and SAV = 1.0), with no multi-collinearity issues between each set of predictor variables. The coefficient of determination (R^2) that represents proportional variance of endogenous amount explained by the respective exogenous of BEH (0.07) and SAV (0.26), with values of 0.75, 0.50, or 0.25 respectively described as substantial,

moderate, and weak (Hair, Ringle, & Sarstedt, 2011)SEM is equivalent to carrying out covariance-based SEM (CB-SEM. In addition, the estimated model in Standardized Root Mean Residuals (SRMR) is 0.07 to confirm the data has fulfilled Goodness-of-fit (GoF) requirement of <0.08 (Henseler et al., 2014)but instead to three problems with Rönkkö and Evermann's study: (a.

The *t*-values are disclosed in Table 3. All associations were found significance at *a* >1.645 with the lower limit confidence interval (BootLLCI) and upper limit (BootULCI) do not straddle between zero, except for FLB-BEH with rejected *t* = 0.249, BootLLCI= −0.129, and BootULCI = 0.112. The strongest relationship is on BEH-SAV with *t* = 7.245, BootLLCI = 0.304, BootULCI = 0.501 which predominantly contributed by the highest loading in terms of individual intention to have perfect retirement (SAV4), and perception on future uncertainty (BEH3RC). Despite being a positive relationship for FLB-SAV with *t* = 1.756, BootLLCI = 0.010, and BootULCI = 0.206, yet the index was relatively low with only 6% above conditional threshold, thus poor to explain variance on individual basic financial knowledge towards household savings motivation. This was also confirmed by the weakest f^2 = 0.014. On the other hand, SAV has a strongest f^2 on BEH (0.219), followed by FLA (0.028), and FLB (0.000), with a total effect of 0.057 [(0.071*0.219) + (0.000*0.219) + (0.014) + (0.028)]. According to Cohen (1988), f^2 values of 0.02, 0.15, and 0.35 constitute realistic standards for small, medium, and large effect by using an aforementioned equation of $f^2 = (R^2_{included} − R^2_{excluded}) / (1 − R^2_{included})$. Therefore, by looking at the specific element on the strongest f^2 between SAV-BEH (22%), it is advisable for government or policy maker to concentrate more on promotional campaigns that positively influenced individual beliefs to accumulate additional retirement savings.

Next, the study proceeds with blindfolding procedure to assess predictive relevance (Q^2). Estimation from the Construct Cross-validated Redundancy have shown the Q^2 (= 1 − SSE/SSO) of endogenous latent variables are relatively above zero with the highest values of SAV4 (0.21), SAV3 (0.17), and SAV1 (0.11). It supports the model's Q^2 with a value of larger than 0 and has accurately predicted the data that are not used in the estimation of model parameters. Manual computation of q^2 effect size ($Q^2_{included} − Q^2_{excluded}) / (1 − Q^2_{included}$) further confirmed the initial value of SAV = 0.137, and BEH = 0.032. When FLB is omitted from the path and re-evaluated the model, changes for $Q^2_{excluded}$ are small with 0.132 for SAV, and no changes for BEH with 0.032. However, the q^2 values have slightly dropped to 0.126 for SAV, and 0.000 for BEH when FLA is removed from the path and the model. This indicates the role of FLA as an input to increase the q^2 effect size of BEH and SAV, following the rules of thumb that q^2 relationship can be categorized into small (0.02), medium (0.15), and large (0.35) (Henseler, Ringle, & Sinkovics, 2009).

Table 3 Hypothesis testing on direct relationship

	Relationship	Standard Beta	Standard Error	*t*-values	f^2	q^2	BootLLCI	BootULCI	Decision
#1	FLB – SAV	0.120	0.060	1.756	0.014	0.008	0.010	0.206	Supported
#2	FLB – BEH	−0.020	0.075	0.249	0.000	0.000	-0.129	0.112	Not supported
#3	FLA – SAV	0.161	0.057	2.881	0.028	0.013	0.082	0.268	Supported
#4	FLA – BEH	0.268	0.067	3.907	0.071	0.033	0.125	0.355	Supported
#5	BEH – SAV	0.428	0.058	7.245	0.219	0.101	0.304	0.501	Supported

** *p*<0.05
- R^2 (BEH: 0.067, SAV: 0.261). f^2 impact indicator are 0.02 (small), 0.15 (medium), and 0.35 (large) (Cohen, 1988)
- Q^2 (BEH: 0.032, SAV: 0.137). Q^2 of exogenous latent variables are 0.02 (small), 0.15 (medium), and 0.35 (large) (Henseler et al., 2009)

The Mediating Effect Analysis

Finally, a mediating analysis was performed for substantiating the mechanisms that underlie between exogenous and endogenous constructs in the model (Hair et al., 2017). The complimentary intervening technique with Bias-corrected Accelerated (BCa) option and two-tailed test at 0.1 significance level, have shown a positive mediating roles of BEH on FLA-SAV relationship, with 8.3% coefficient path increased from previous direct effect of $t = 2.881$, BootLLCI = 0.082, and BootULCI = 0.268, to the indirect effect of $t = 3.143$, BootLLCI = 0.046, and BootULCI = 0.163. However, there is no mediation effect for BEH on FLB-SAV, with no relationship with the indirect path of $t = 0.243$, BootLLCI = − 0.064, and BootULCI = 0.041, from previous direct BEH-SAV effect of $t = 1.756$, BootLLCI = 0.0010, and BootULCI = 0.206, as reported in the following Table 4.

Table 4 Hypothesis testing on indirect relationship

	Relationship	Standard Beta	Standard Error	t-values	BootLLCI	BootULCI	Decision
#6	FLB-BEH-SAV	−.006	0.032	0.243	−0.064	0.041	Not supported
#7	FLA-BEH-SAV	0.112	0.035	3.143	0.046	0.163	Supported

** *p*<0.1
- R^2 (BEH: 0.067, SAV: 0.261). f^2 impact indicator are 0.02 (small), 0.15 (medium), and 0.35 (large) (Cohen, 1988)
- Q^2 (BEH: 0.032, SAV: 0.137). Q^2 of exogenous latent variables are 0.02 (small), 0.15 (medium), and 0.35 (large) (Henseler et al., 2009)

5.0   Discussion and Conclusion

Despite being acknowledged as one of the decisive factor in individual's savings and retirement plans, the study found factual conclusion on financial literacy that somehow might be misled. The results have shown that the basic literacy contributes none sufficient impact to support retirement savings. Particularly, individual's mastery on routine financial transaction and simple decision-making are actually more on cognitive approach rather than knowledge ability. It was proven by the lowest index on an acceptable threshold value for relationship with retirement savings and behavioural beliefs, thus suggesting that minimal financial literacy will not motivate persons to save for retirement.

Conversely, respondents with the higher level of advanced financial literacy are having more positive financial behaviour and likely to save for future prosperity. With further consideration to proposed hypotheses, the study found that an advanced financial literacy is significantly associated with both retirement savings and behavioural beliefs. In other words, individual's proficiency and understanding on complex market instruments and investment strategies are likely to be more optimists and will accumulate wealth. They are more concerned with issue on pension inadequacy and relying more on formal financial advice rather than entrusting on family and friends. They are also likely to make profit and stay successfully in the capital market, and willing to take a risk on their decision-making process, vice versa. The result is consistent with Rooij et al. (2011); advanced financial literacy is an important determinant of stock-ownership and become a crude proxy of actual knowledge ability. With a growing human life expectancies, major transitions of a pension scheme, the lower level of household savings, and subsequent global economic hardship, it is important for Malaysia to intensifying more financial educational and awareness programmes that influencing households financial practices exclusively on advanced capital markets and strategic investments.

Apart from that, this study discovers the significant relationship between individual behavioural beliefs and the outcome variable with a highest relative error difference than the other predictive variables in contrast to the null hypothesis. Majority of them acknowledged the consequences of performing a minimum of 10% regular savings and considered it as a good practice, highly useful, and essential for the golden years. Behavioural belief with a respect of individuals understanding on subjective probability attitude towards certain attribute, and outcome evaluations on subjective valence of the result, are being the most prevailing determinants of individual intentions and attitudinal responses particularly in behavioural finance assumption. It

relates to the degree of agreeable or disagreeable on individuals evaluation to perform the behaviour in consideration (Ajzen, 1991)1985, 1987. Therefore, since individual behavioural beliefs were found positively associated with behavioural savings, then it is appropriate for the government and stakeholders to take this opportunity in offering more alternative retirement savings and investments portfolio with a high potential of growth product, as an additional of existing mandatory DB and DC pension scheme to public and private sectors in Malaysia.

Nevertheless, this study has recorded a mixed result of indirect effect from the proposed hypothetical assumptions. The study has indicated a strong mediation role of behavioural beliefs in explaining the relationship between advanced financial literacy and retirement savings. It was proven by the highest statistical significant beta weighted indicator in term of strengthening the positive correlation with a larger effect, compared to the previous direct association between the two variables. On the other hand, contrarily as expected, the study found no mediating role for individual behavioural beliefs in the relationship between basic financial literacy and retirement savings, thus further ratified the minimal impact of the predicted variable in fostering individuals intention and participation in performing behaviour on specified context. Both findings are consistent with Ajzen (1991) on how underlying foundation of individual beliefs response from direct or intervening effect in providing substantive information about a behavioural motives. This also suggests that individuals may carry many behavioural beliefs subjectively to any given order, but those with an advanced literacy will be guided by better tendency on having highest financial security, which eventually produces a positive beliefs and behavioural intention to save and invest for retirement adequacy, vice versa.

This study has manifested an imperative result in strengthening financial behaviour in global economic societies. However, it may come with several restrictions due to a single cross-sectional data type of collections, demographic biasness following most respondents were young subordinates that generally permitted by a lower income and a higher propensity to accumulate debts, and may lack of data consistency in consequences of favourable self-rated on attitudinal beliefs and individual intention, which sometimes being overestimated by respondents beyond their factual capabilities. Future study may include a longitudinal method that represents more estimation on behavioural pattern in longer periods, a larger sample size for generalizations, and include more predicted variables that give additional comprehensive explanation on financial decision-making process.

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