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Financial Well-Being, Financial Literacy, And Environmentally Sustainable Behaviour: A PLS-SEM Approach

Kesejahteraan Kewangan, Literasi Kewangan, dan Tingkah Laku Lestari Alam Sekitar: Pendekatan PLS-SEM

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Abstract: Financial well-being is a global concern affecting human development, economic progress, social stability, and overall quality of life. Despite the groundswell of interest, research on this topic is still in its infancy, with significant gaps to be filled. These days, climate change has garnered significant global attention, with a focus on the impact financially well individual on environmentally sustainable behaviour. Using the Theory of Planned Behaviour (TPB), this study is therefore conducted to explore the influence of financial literacy on financial well-being and financial well-being on environmentally sustainable behaviour among Malaysians. The study's hypotheses were tested using the partial least squares structural equation modelling (PLS-SEM) technique, based on data from 271 respondents. The result of the study highlights the importance of financial knowledge, financial attitudes, and financial behaviour in influencing financial well-being and how financial well-being, in turn, impacts environmentally sustainable behaviour. It also sheds light on the mediating role of financial well-being in the relationship between financial literacy and environmentally sustainable behaviour. By extending the TPB-based model, the study broadens the body of research on the association between financial wellness and environmental sustainability. The study aims to assist government and non-governmental organizations in achieving the United Nations' Sustainable Development Goals (SDG) 2030, including no poverty, good health, reduced inequality, responsible consumption and production, and climate action.

Keywords: Financial Well-Being, Financial Literacy, Environmentally Sustainable Behaviour, Sustainable Development Goals, PLS-SEM;

Abstrak: Kesejahteraan kewangan ialah kebimbangan global yang menjejaskan pembangunan manusia, kemajuan ekonomi, kestabilan sosial, dan kualiti hidup secara keseluruhan. Walaupun terdapat peningkatan minat dalam bidang ini, namun penyelidikan mengenai topik ini masih di peringkat awal, dengan jurang yang ketara yang perlu diisi. Sejak akhir-akhir ini, perubahan iklim telah mendapat perhatian global yang ketara, dengan tumpuan kepada pengaruh individu yang mempunyai kesejahteraan kewangan terhadap tingkah laku lestari alam sekitar. Dengan menggunakan Teori Tingkah Laku Terancang (TPB), kajian ini dijalankan untuk meneliti pengaruh literasi kewangan terhadap kesejahteraan kewangan dan seterusnya kesejahteraan kewangan terhadap tingkah laku lestari alam sekitar dalam kalangan rakyat Malaysia. Hipotesis kajian telah diuji menggunakan teknik pemodelan persamaan struktur kuasa dua terkecil separa (PLS-SEM), berdasarkan data daripada 271 responden. Hasil kajian menekankan kepentingan pengetahuan kewangan, sikap kewangan, dan tingkah laku kewangan dalam mempengaruhi kesejahteraan kewangan dan bagaimana kesejahteraan kewangan, seterusnya, memberi kesan kepada tingkah laku lestari alam sekitar. Kajian ini juga memberi penerangan tentang peranan pengantara kesejahteraan kewangan dalam hubungan antara literasi kewangan dan tingkah laku lestari alam sekitar. Dengan memperluaskan model berasaskan TPB, kajian ini mengembangkan badan penyelidikan tentang perkaitan antara kesejahteraan kewangan dan kelestarian alam sekitar. Dapatan kajian ini bertujuan membantu kerajaan dan pertubuhan bukan kerajaan dalam mencapai Matlamat Pembangunan Lestari (SDG) Pertubuhan Bangsa-Bangsa Bersatu 2030, termasuk tiada kemiskinan, kesihatan yang baik, pengurangan ketidaksamaan, penggunaan dan pengeluaran yang bertanggungjawab, dan tindakan iklim.

Kata kunci: Kesejahteraan Kewangan, Literasi Kewangan, Tingkah Laku Lestari Alam Sekitar, Matlamat Pembangunan Lestari, PLS-SEM

Introduction

In 2015, 193 United Nation (UN) member states endorsed the 17 Sustainable Development Goals (SDGs), also known as Agenda 2030, with the goal of achieving sustainable economic, environmental, and social development by 2030 to enhance global quality of life. The SDGs were created in response to the industrial revolution's environmental issues, such as displacement, deforestation, and climate change, seeking to end poverty and injustice, save the environment, and guarantee everyone's prosperity, justice, and health.

The UN has emphasized the significance of wealth and environmental protection, urging the global community to uphold financial and environmental well-being. Despite efforts, financial well-being is still far from being achieved (Ghazali et al., 2023) and environmental issues such as contamination, climate change, and resource depletion continue to increase in recent years (Yusliza et al., 2020). Yusliza et al. (2020) added that human behaviour is among the significant factors contributing to those various issues. Hence, the study aims to investigate whether individuals with financial well-being are concerned about environmental sustainability.

Financial well-being and environmental sustainability are crucial for attaining several key SDGs 2030, including no poverty (SDG1), good health and well-being (SDG3), reduced inequality (SDG10), responsible consumption and production (SDG12), and climate action (SDG13). Individuals with financial literacy and a comprehensive approach to financial well-being are more inclined to interact in environmentally sustainable practices. The integration of financial and environmental factors signifies a broader comprehension of the interconnectedness of personal, economic, and environmental health.

Financial well-being is an indispensable planetary issue influencing human development, economic growth, social stability, and quality of life, and is essential for individual prosperity, a country's economy, and societal health (Lusardi, 2015). Beyond question, the issue has become a worldwide concern requiring global attention and action, with even greater urgency at the national level. The worldwide focus is shifting towards the impact of financial well-being on environmentally sustainable behavior due to rising international concern over climate change. Financial well-being and environment stability are interconnected in several ways, and the financial well-being of individuals, communities, and nations, thus, significantly influences sustainable economic activities, contributing to the healthy and stable environment. Therefore, the SDGs can be achieved through financial well-being and environmental sustainability.

Despite being widely investigated, research on financial well-being is still in its early phases (Kaur et al., 2021; Riitsalu et al., 2023). Similarly, there is little and scarce research on the relationship between financial stability and environmental stability (Kirikkaleli et al., 2022; Kirikkaleli & Sofuoğlu, 2023). This suggests that there is more room for exploration in comprehending the factors that drive financial well-being and how it contributes to attaining environmental sustainability.

The relationship between financial well-being and environmental sustainability and environmentally sustainable behaviour although still in the early stages, but studies have shown that financial well-being has an impact on environmental sustainability.

Studies by Kirikkaleli et al. (2022) and Kirikkaleli and Sofuoğlu (2023) in Norway and Ireland suggest that financial stability can significantly reduce carbon emissions by Including risks associated with climate change in its framework for monitoring financial stability. Therefore, this study is motivated by a lack of theoretical and empirical understanding of financial well-being and environmental sustainability.

Financial decisions, such as purchasing habits, significantly impact the environment by contributing to greenhouse gas emissions and other pollution by influencing the types of products individuals buy and consume resources. Hence, financial literacy empowers individuals to make informed and sound decisions about their purchases and resources, promoting sustainable living practices.

In this regard, this current study offers an original perspective on the relationships between financial literacy, financial well-being, and environmentally sustainable behaviour. The study's novelty lies in its lack of exploration of relationships between environmental sustainability and Malaysian context, as existing literature on this topic is largely influenced by developed countries' perspectives, and no empirical evidence from Malaysia has been provided on the theoretical framework presented. This study fills a gap in the existing literature on sustainability in Malaysia.

Literature Review

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB), an enhancement of the Theory of Reasoned Action (TRA), developed by Ajzen (1991), is widely used by researchers to explain factors that influence an individual's behaviour. Ajzen (1991) suggests that modifying and expanding the TPB model, including or excluding external constructs, could enhance its predictive power by better explaining individual behaviour. Following Ajzen's recommendation, a number of researchers enhanced the original model by adding more external variables to forecast behaviour. In a similar context of this study, Ajzen's TPB is a popular theory for studying financial literacy (Sinnewe & Nicholson, 2023), environmental studies (Kumar et al., 2022), and financial well-being (Munisamy et al., 2022). However, those studies utilizing TPB framework resulted in inconclusive research findings due to different research setting, prompting this study to address the gaps.

Environmentally Sustainable Behaviour

Sustainability is defined by the United Nations (2024) as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*." Environmental sustainability involves meeting the resource demands of present and future generations without compromising the ability of future generations to meet their own needs, while simultaneously preserving biodiversity and ecological processes (Ziaul & Shuwei, 2023). Over time, it maintains ecological balance and biodiversity by engaging with the environment responsibly, preventing the depletion or degradation of natural resources. Hence, environmentally sustainable individuals demonstrate responsibility towards the environment, including climate change awareness, resource conservation, waste reduction, and conscious reuse of waste.

The environmental abuse poses a significant financial challenge at various levels. For instance, natural disasters brought on by climate change can inflict not just emotional and psychological distress but also financial difficulty (Asbi et al., 2020). Financial wellness can enhance climate change-responsiveness, as individuals committed to positive financial outcomes are recognized for their potential to achieve sustainable practices and environmental care. This study suggests that Malaysians' financial stability may lead to environmentally sustainable behaviours.

Financial Literacy

Financial literacy, a concept that has been debated across various sectors for years, has yet to receive a definitive definition within academia. The reason being is that financial literacy is a multifaceted concept hence no universally agreed-upon definition. Thus, resulting in scholarly disagreements and interpretations that are contingent on the study context. Some authors emphasize knowledge and understanding (Huston, 2010; Lusardi & Mitchell, 2011), while others view the concept's relevance as a blend of awareness, knowledge, skills, attitudes, and behaviour patterns (Dewi et al., 2020; Haupt, 2021; Lusardi, 2015) related to managing personal finance. The Organization for Economic Cooperation and Development (OECD, 2013) provides a comprehensive and accounts for the variations in interpretation among scholar of financial literacy as "a combination of awareness, knowledge, skill, attitude, and behaviour necessary to make sound financial decisions and ultimately attaining individual financial well-being." This definition is comprehensive and accounts for the variations in interpretation among scholar. By the OECD standard, financial literacy equips individuals to effectively manage daily expenses, maintain an emergency fund, plan for their children's education, and prepare for retirement. Against this backdrop, the OECD approach to financial literacy, which includes the integration of financial awareness, financial knowledge, financial skill, financial attitude, and financial behaviour in promoting financial well-being, was adopted by this study.

All of the aforementioned studies lend credence to the idea that financial literacy consists of financial behavior, financial attitude, financial knowledge, and financial awareness. Each element plays a critical role in forming financial literacy, which enhances people's ability to make sound financial decisions and maintain their overall financial well-being (Lusardi, 2015; Lusardi & Messy, 2023).

Financial Awareness

Financial awareness is part of financial literacy (Almenberg & Säve-Söderbergh, 2023; Klapper & Lusardi, 2023; Lone & Bhat, 2024). Financial awareness is the comprehensive understanding of financial concepts, practices, and products essential for effective personal financial management to achieve financial goals (Chowdhry & Dholakia, 2020; Nga et al., 2010; Remund, 2010). These include budgeting, saving, investing, planning, credit management, debt management, and overall financial literacy. Financially aware individuals make informed decisions, boosting their confidence and self-efficacy, which leads to greater satisfaction and overall financial well-being (Van Rooij et al., 2012). On the other hand, individuals lacking financial awareness have limited knowledge about financial products and services, which ultimately impacts their financial decision-making (Guiso & Jappelli, 2005). Hence, individuals lacking or with limited financial awareness leading to a lower level of financial well-being (Lone & Bhat, 2024). Hence, based on these argument, this study hypothesizes that:

H1: There is a significant and positive relationship between financial awareness and financial well-being.

Financial Knowledge

Financial knowledge is a crucial factor in assessing one's financial well-being. Financial knowledge involves mastering fundamental economic concepts and financial concepts, as well as effectively managing and allocating financial resources (Liu et al., 2023). Financial knowledge, acquired through education or experience (Huston, 2010), enhances financial well-being by aiding in effective financial management, preventing excessive debt, and increasing future savings and investments (Lusardi & Mitchelli, 2007; Van Rooij et al., 2012), thus preventing financial difficulties and promoting financial well-being (Lusardi & Tufano, 2015). Conversely, those who lack financial literacy are more likely to to accumulate significant debt and to have large mortgages. Consequently, compared to those with lesser knowledge, those with greater financial literacy are more likely to achieve financial well-being. Studies by Iramani and Lutfi (2023) and Selvia et al. (2021) have shown that financial knowledge significantly predicts financial well-being. Therefore, this study postulates that:

H2: There is a significant and positive relationship between financial knowledge and financial well-being.

Financial Attitude

Financial attitude is determinant of financial literacy (Yahaya et al., 2019). Financial attitude refers to a person's personal approach to financial matters (Rai et al., 2019), beliefs and feelings about money management (Falahati & Hj. Paim, 2012), and their thoughts, opinions, and judgments on financial matters, which significantly influence their financial decision-making process (Arifin, 2018). Those definitions emphasize the state of mind, feelings, opinions, and judgement in understanding and addressing financial issues. Strong financial attitudes are crucial for achieving future financial profit (Bhargava et al., 2022). A positive financial attitude can be assessed by evaluating one's attitude towards managing cash flow, investments, or planning. Studies by Akben-Selcuk (2015) and Sabri and Aw (2020) found that individuals with a positive financial attitude effectively plan monthly bills, stay within budget, manage future savings, and exercise caution with expenditures. Consequently, a person's financial attitude influences their capacity for prudent money management, which in turn influences their financial well-being (Lavonda et al., 2021; Rafien et al., 2022);

hence, this study posits that:

H3: There is a significant and positive relationship between financial attitude and financial well-being.

Financial Behaviour

The OECD (2013) emphasizes the significance of financial behaviour as a fundamental aspect of financial literacy. Financial behaviour refers to specific actions, reactions, or performances that are conducted in a specific manner regarding money management (Parrotta & Johnson,1998; Sabri et al., 2022). Positive financial behaviour, like budgeting and stability, improves financial well-being, while negative behaviour like reliance on credit and loans weaken it (Atkinson & Messy, 2012). Financial behaviour has a direct bearing on financial well-being (Brüggen et al., 2017). In a manner that fosters financial well-being, prudent financial practices such as saving, budgeting, staying away from risky choices, keeping spending under control, and refraining from compulsive buying (Sabri et al., 2021; Xiao et al., 2009). Therefore, this study proposes that:

H4: There is a significant and positive relationship between financial behaviour and financial well-being.

Financial Well-Being

Financial well-being is a subjective concept with no globally agreed-upon definition or measurement, leading to various definitions by scholars and practitioners based on their research settings. Some scholars define financial well-being as the feeling of financial security and the ability to maintain a desired living standard (Brüggen et al., 2017) and others define it as both short and long term, allowing individuals to make choices that allow them to enjoy their life (Hasler et al., 2023). While the Consumer Financial Protection Bureau (CFPB) defines financial well-being as a state where individuals can meet their financial obligations, feel secure in their financial future, and make choices that allow them to enjoy life. The definitions emphasize financial responsibility, stability, freedom of choice, and life enjoyment in relation to financial well-being, referring to having sufficient money to meet one's needs.

Recent studies have focused on examining whether individuals with sound financial standing can contribute to environmentally sustainable behaviour (Yusliza et al., 2020). Studies reveal that financial antecedents, including awareness, knowledge, attributes, and behaviour, significantly influence environmentally sustainable behaviour among individuals across various financial domains (Katini & Amalanathan, 2022). Furthermore, research has shown that people who receive financial incentives, specifically, cash incentives, are more successful in encouraging certain pro-environmental behaviours, like recycling and travel (Maki et al., 2016). Hence, this study lends credence to the idea that people's environmentally sustainable behavior can be greatly influenced by their financial wellness, as suggested by the previously mentioned studies. The following hypothesis is put forth:

H5: There is a significant and positive relationship between financial well-being and environmentally sustainable behaviour.

Previous studies have explored the role of financial well-being as a mediator between various financial components and behavioural factors (Dahlen et al., 2024; Estela-Delgado et al., 2023, Munisamy et al., 2022), they have successfully proven the mediating effect of financial well-being. To the best of the researchers' knowledge, however, the role that financial well-being plays as a mediator between elements of financial literacy and environmentally sustainable behaviour has not yet been investigated. Therefore, this study is the first of its kind in the field. Drawing from these arguments, the study posits the following hypotheses:

H6: Financial well-being mediates the relationship between financial awareness and environmentally sustainable behaviour.

H7: Financial well-being mediates the relationship between financial knowledge and environmentally sustainable behaviour.

H8: Financial well-being mediates the relationship between financial attitude and environmentally sustainable behaviour.

H9: Financial well-being mediates the relationship between financial behaviour and environmentally sustainable behaviour.

Research Framework

Figure 1. Research framework

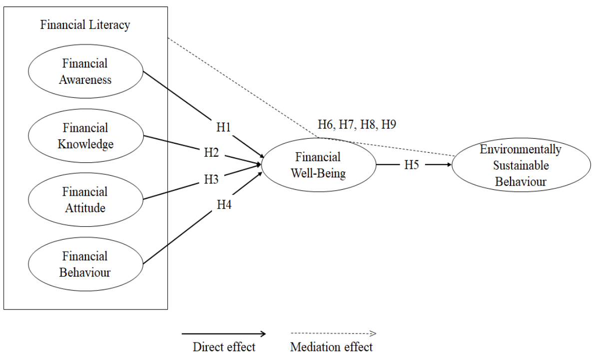


Figure 1 shows the research framework and the five hypotheses that are put forth in this study.

Methodology

Sampling and Data Collection Procedure

This study is a quantitative study that employs an online questionnaire survey to gather data. The questionnaire was formulated on Google Forms and the uniform resource locator (URL) link was shared across a number of social media sites, primarily Facebook and WhatsApp. The data collection process was conducted during the four weeks of December 2023 to January 2024 across all five major regions in Malaysia. A total of 271 responses were received, which was deemed sufficient for further analysis. The data were examined using IBM SPSS version 24 to describe the data and Smart PLS4.0 structural equation modelling for testing hypotheses.

Instrumentation

The survey questionnaire consisted of two parts. The first part, which aimed to understand respondents' demographic characteristics such as gender and age, and the second part, which sought to understand the factors influencing their perceptions of financial literacy, financial well-being, and environment sustainability. The measurement items were derived from previous established studies, with some revisions. The measurement items for financial awareness, financial knowledge, financial attitude, financial behaviour, and environmentally sustainable behaviour were adapted from Katini and Amalanathan (2022) and the items related to financial well-being were sourced from Renaldo et al. (2020). All items were measured using a five-point Likert scale, where 1 represented strong disagreement and 5 represented strong agreement. The statements for each construct and item, along with their respective sources, are detailed in Table A1 in the Appendix.

Partial Least Squares Structural Equation Modelling

Partial least squares structural equation modelling (PLS-SEM) was used to analyse the data and test the study's hypotheses. PLS-SEM is a statistical model consisting of two components: the measurement model, which verifies the relationship between latent and observable variables; and the structural model, which assesses the significance and relevance of path coefficients, followed by the model's explanatory and predictive power (Hair et al., 2014).

Results and Discussions

Respondents' Profile

Table 1 displays the demographic data of the study's 271 respondents, revealing that 57.6% were male and 42.4% were female. The majority of respondents were Malay (77.5%), followed by Chinese (12.5%) and Indian (10.0%). Those between the ages of 18 and 24 made up the largest age group of respondents (45.0%), followed by those between the ages of 25 and 36 (16.2%) and those 49 and older (14.4%). 50.6% of the sample either had completed or were pursuing a bachelor's degree, and a sizable portion (60.9%) was single. The majority of respondents (56.5%) were employed, with 48.3% earning less than RM2,500, and the majority (48.3%) were from the central region.

The study delineated respondents' regions by specifying the states included in each of the five designated areas. The Central Region encompasses Selangor and Wilayah Persekutuan (Kuala Lumpur, Putrajaya, and Labuan), while the Northern Region includes Kedah, Penang, Perak, and Perlis. The Southern Region comprises Johor, Melaka, and Negeri Sembilan. The East Coast consists of Kelantan, Pahang, and Terengganu, whereas the East Malaysia is represented by Sabah and Sarawak. This clear classification enables respondents to easily identify and select their respective regions based on their state of residence.

Table 1. Respondents' Profile

Description		N	%
Gender	Male	156	57.6
	Female	115	42.4
Ethnic	Malay	210	77.5
	Chinese	34	12.5
	Indian	27	10.0
Age	18 – 24	122	45.0
	25 – 30	44	16.2
	31 – 36	17	6.3
	37 – 42	14	5.2
	43 – 48	35	12.9
	49 and above	39	14.4
Marital Status	Single	165	60.9
	Married	106	39.1
Educational Level	Diploma	67	24.7
	Bachelor	137	50.6
	Master/PhD	32	11.8
	Other	35	13.0
Occupation	Employed	153	56.5
	Unemployed	9	3.3
	Students	109	40.2
Income	RM2,000 and below	129	47.6
	RM2,001 – RM4,000	54	19.9
	RM4,001 – RM6,000	31	11.4
	RM6,001 – RM8,000	23	8.5
	RM8,001 – RM10,000	13	4.8
	RM10,001 and above	21	7.7
Region of Residence	Central Region	131	48.3
	Northern Region	30	11.0
	Southern Region	75	27.8
	East Coast	27	10.0
	East Malaysia	8	2.9

Assessment of Measurement Model

According to Hair et al. (2022), the model must meet the requirements of convergent validity, discriminant validity, and reliability test and failure to evaluate the constructs validity and reliability can significantly impact the validity of the study results. As shown in Table 2, the indicators' reliability surpassed the recommended threshold, with outer loadings exceeding 0.7 (Hair et al., 2010), Cronbach's alpha scores larger than 0.7 (Nunnally & Bernstein, 1994), and Composite Reliability (CR) values above 0.6 for every construct (Hair et al., 2014). Also, all of the constructs have met the convergent validity thresholds, with all indicators showing factor loadings greater than 0.5 (Byrne, 2016; Hair et al., 2010) and Average Variance Extracted (AVE) values greater than 0.5 (Hair et al., 2022).

Table 2. Constructs' validity and reliability results

Construct & Item	Outer Loading	Cronbach's Alpha	CR	AVE
Financial Awareness		0.903	0.932	0.775
FAw1	0.857			
FAw2	0.878			
FAw3	0.902			
FAw4	0.884			
Financial Knowledge		0.898	0.929	0.765
FK1	0.887			
FK2	0.904			
FK3	0.873			
FK4	0.834			
Financial Attitude		0.916	0.931	0.627
FAtt1	0.739			
FAtt2	0.829			
FAtt3	0.732			
FAtt4	0.806			
FAtt5	0.816			
FAtt6	0.836			
FAtt7	0.794			
FAtt8	0.778			
Financial Behaviour		0.915	0.937	0.747
FB1	0.866			
FB2	0.847			
FB3	0.831			
FB4	0.888			
FB5	0.889			
Financial Well-Being		0.907	0.931	0.730
FWB1	0.855			
FWB2	0.856			
FWB3	0.856			
FWB4	0.857			
FWB5	0.848			
Environmentally Sustainable Behaviour		0.919	0.937	0.713
ESB1	0.842			
ESB2	0.838			
ESB3	0.834			
ESB4	0.847			
ESB5	0.850			
ESB6	0.854			

Subsequently, the discriminant validity test was conducted using the Fornell-Larcker and heterotrait–monotrait (HTMT) ratio to confirm that the measurement variables are not related to each other or have a weak association. The root square of AVE and inter-construct correlations were compared, with each variable's AVE greater than its squared correlation with any other variable for discriminant validity valuation (Fornell & Larcker, 1981). The study's Fornell-Larcker criterion, as shown in Table 3, indicates that the AVE has a stronger correlation with any other construct. In addition, the HTMT results, with all cases having a value less than 0.9 (Henseler et al., 2015). Both indicating favourable discriminant validity. Overall, the study successfully passed the measurement model assessments.

Table 3. Discriminant validity: Farnell-Larcker and HTMT

Construct	1	2	3	4	5	6
Fornell-Larcker						
1. ESB	0.844					
2. FAtt	0.762	0.792				
3. FAw	0.695	0.771	0.880			
4. FB	0.726	0.789	0.646	0.864		
5. FK	0.640	0.710	0.709	0.601	0.875	
6. FWB	0.623	0.672	0.597	0.609	0.684	0.854
HTMT						
1. ESB						
2. FAtt	0.823					
3. FAw	0.763	0.847				
4. FB	0.796	0.861	0.711			
5. FK	0.701	0.764	0.788	0.662		
6. FWB	0.677	0.705	0.656	0.665	0.747	

Assessment of Structural Model

Following completion of the measurement model evaluation and verification that the values met all requirements, the study proceeded to use the bootstrapping procedure to test the relationships that were hypothesized in the structural model assessments. The procedure was run with the recommended settings, including 5,000 subsamples, a 0.05 significance level, and the confidence interval approach for accelerated and bias-corrected analysis (Hair et al., 2022). Figure 2 provides a comprehensive report of the structural model results, while Table 4 details the proposed model's path coefficient, standard error, and t-statistics.

Table 4. Summary of hypotheses testing

Hypothesis and Path		Std. Beta	Std. Error	t-value	p-value	f^2	Decision
H1	FAw → FWB	0.021	0.075	0.281	0.779	0.000	Not Supported
H2	FK → FWB	0.396	0.069	5.725	0.000	0.149	Supported
H3	FAtt → FWB	0.246	0.086	2.870	0.004	0.032	Supported
H4	FB → FWB	0.163	0.079	2.051	0.040	0.022	Supported
H5	FWB → ESB	0.623	0.047	13.257	0.000	0.633	Supported
H6	FAw →FWB → ESB	0.013	0.047	0.278	0.781		Not Supported
H7	FK →FWB → ESB	0.247	0.048	5.175	0.000		Supported
H8	FAtt →FWB → ESB	0.153	0.054	2.815	0.005		Supported
H9	FB →FWB → ESB	0.102	0.051	1.982	0.048		Supported

Table 4 demonstrates that all hypotheses, except for H1 and H6, were supported in their predicted directions, thus validating the proposed study model. Financial awareness was found to be insignificant to financial well-being ($\beta = 0.021$, $p > 0.05$), hence H1 was not supported. This suggests that mere awareness of financial concepts does not necessarily translate into improved financial well-being. This finding aligns with previous research indicating that awareness alone is insufficient without practical application and deeper understanding (Lusardi & Mitchell, 2014). Financial well-being requires more than just awareness of financial concepts; it requires the knowledge and skills to apply them in daily life. Awareness alone may not be enough to improve financial health, as knowledge and behavioral changes are also necessary for a significant impact.

Financial knowledge was found to be positively and significantly related to financial well-being ($\beta = 0.369$, $p < 0.05$), which supports H2. This supports the notion that a well-informed individual is better equipped to make sound financial decisions, leading to improved financial stability and well-being. The result is in line with the findings of previous studies (Iramani & Lutfi, 2023; Selvia et al., 2021). Financial well-being is greatly increased by grasping financial concepts and being able to put them into practice. This suggests the potential impact of educational initiatives aimed at enhancing financial literacy on people's financial well-being.

As hypothesized, H3 was supported when it found a significant positive correlation between financial attitude and financial well-being ($\beta = 0.246$, $p < 0.05$), confirming previous research by Lavonda et al. (2021) and Rafien et al., (2022). Individuals who exhibit a proactive and positive approach towards managing their finances tend to experience higher financial well-being, highlighting the importance of mindset and attitudes towards finances in maintaining financial health. Thus, developing positive financial attitudes through counseling and education can therefore play a crucial role in enhancing financial well-being.

H4 was validated by the substantial positive correlation it discovered between financial behaviour and financial well-being ($\beta = 0.163$, $p < 0.05$). This indicates that individuals who engage in prudent financial practices, such as budgeting and saving, experience better financial health. The importance of financial behavior in achieving financial well-being is well-documented in literature, highlighting the need for behavioral interventions to promote responsible financial habits (Sabri et al., 2021; Xiao et al., 2009).

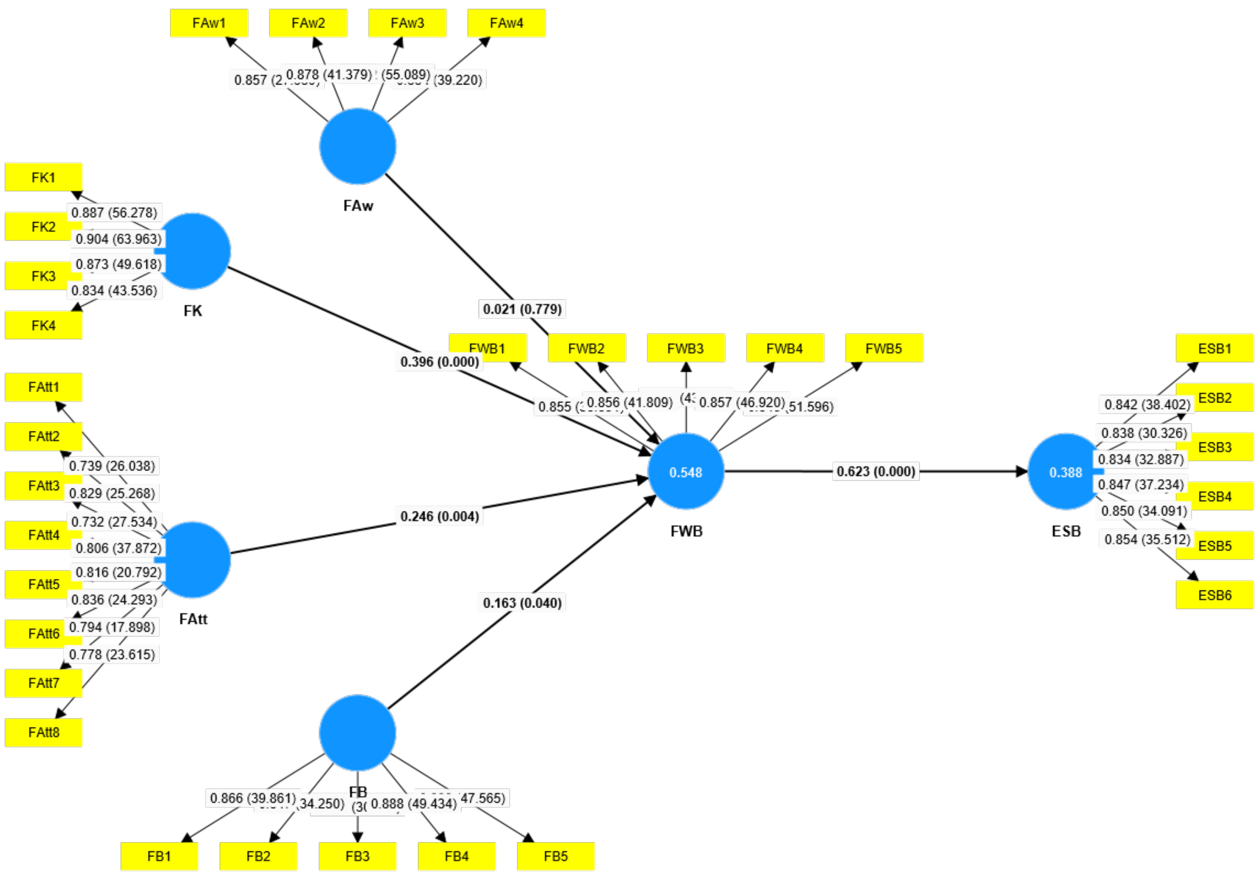
The significant impact of financial well-being on environmentally sustainable behavior ($\beta = 0.623$, $p < 0.05$) reveals an important intersection between economic stability and environmental consciousness, supporting H5. Individuals with higher financial well-being are more likely to engage in environmentally sustainable practices, suggesting that financial stability provides the necessary resources and mindset to prioritize sustainability. This finding is consistent with the theory that economic security allows individuals to consider long-term environmental impacts and engage in sustainable behaviors (Gonzalez et al., 2020). The finding is in line with the studies by Katini and Amalanathan (2022); Maki et al. (2016), and Yusliza et al. (2020). The study reveals that financial resilience significantly influences environmentally sustainable behaviour, as higher financial well-being leads to more environmentally conscious choices.

A set of four hypotheses (H6, H7, H8, and H9) was put forth to investigate the potential mediating role of financial well-being between environmentally sustainable behaviour and financial awareness, financial knowledge, financial attitude, and financial behaviour. Financial well-being does not act as a mediator between financial awareness and environmentally sustainable behaviour ($\beta = 0.013$, $p > 0.05$), thus rejected H6. However, financial well-being acts as a mediator between financial knowledge ($\beta = 0.247$, $p < .05$), financial attitudes ($\beta = 0.153$, $p < 0.05$), and financial behaviours ($\beta = 0.102$, $p < 0.05$) related to environmentally sustainable behaviour, therefore supporting H7, H8, and H9. The outcome aligned with earlier research (Dahlen et al., 2024; Estela-Delgado et al., 2023, Munisamy et al., 2022), which suggests that financial well-being functions as a mediator effectively, albeit within a distinct research setting. The study indicates that financial awareness alone is not sufficient for environmentally sustainable behavior, suggesting that other factors or direct influences are more crucial in linking financial awareness to sustainable practices. Also the study demonstrates that financial well-being plays a crucial role in influencing the relationship between financial knowledge, attitudes, behaviors, and environmentally sustainable actions. This means that enhancing financial knowledge, attitudes, and behaviors can improve financial well-being, leading to environmentally sustainable behavior. Overall, the findings demonstrate how financial and environmental health are intertwined and point to a possible path toward improved environmental outcomes through increased financial literacy and sound financial practices.

The f^2 is classified into small ($f^2 > 0.02$), medium ($f^2 > 0.15$), and high ($f^2 > 0.35$) suggested by Cohen (2013). Table 4 reveals that financial awareness, financial knowledge, financial attitude, and financial behaviour have a smaller effect on financial well-being and financial well-being have a larger effect on environmentally sustainable behaviour (0.633).

R^2 is a predictive accuracy measure that evaluates the combined effect of exogenous and endogenous variables, aiming to maximize variance explanation (Cheah et al., 2018). Falk and Miller (1992) suggest that the R^2 value should be greater than 0.10 when interpreting it. Figure 2 shows that the R^2 for financial well-being and environmental sustainability is 0.388 and 0.548 respectively, indicating that the research model's explanatory power is satisfied.

Figure 2. Research model



Conclusion

This study offers valuable insights into the interconnectedness of financial well-being and environmentally sustainable behaviour among individuals in Malaysia. By integrating theories of financial literacy and environmental sustainability, the research demonstrates that financial well-being significantly influences environmentally sustainable behaviour. The study highlights the interconnectedness of financial literacy, well-being, and sustainable behaviors with several SDGs. Promoting positive financial attitudes and behaviors can significantly contribute to poverty reduction, economic growth, health, education, sustainable communities, responsible consumption, and climate action, fostering sustainable development.

Specifically, despite its importance, financial awareness neither directly affects financial well-being nor acts as a mediator between it and environmentally sustainable behaviour. This implies that in order to promote both financial health and environmental sustainability, financial education programs should put equal emphasis on developing tangible knowledge, positive attitudes, and useful financial skills in addition to increasing awareness. Nonetheless, the study's results affirm the importance of promoting financial literacy as a means to enhance financial well-being and, consequently, foster environmentally sustainable practices. Financial knowledge emerged as a crucial factor, highlighting the need for educational interventions to improve financial literacy among the population. Additionally, the positive relationship between financial attitudes and financial behaviours and environmental sustainability suggests that fostering a positive financial mindset and encouraging responsible financial actions can lead to greater environmental consciousness.

Understanding the relationship between financial literacy, well-being, and sustainable environmental behavior can help educators, policymakers, and community leaders develop integrated strategies. For instance to promote sustainable environmental behavior and enhance financial literacy, comprehensive financial education programs should be implemented in schools, workplaces, and community centers. Policies supporting financial stability, such as affordable services, consumer protection laws, and incentives for saving and investing, should be developed. Furthermore, incentives for purchasing environmentally sustainable products and investing in green technologies can encourage sustainable choices. Also, community engagement efforts should encourage financially well individuals to act as role models, promoting financial literacy and environmental behavior. Overall, Malaysia can achieve its SDGs by integrating financial well-being with environmental sustainability. Addressing knowledge gaps, promoting positive financial attitudes, and leveraging financial well-being as a driver for sustainable development can contribute to inclusive economic growth and long-term prosperity.

However, the study also acknowledges limitations, such as the cross-sectional nature of the data and the potential for self-report bias. Future research should consider longitudinal studies to better understand the causal relationships between financial well-being and environmentally sustainable behaviour. Furthermore, expanding the research to different cultural contexts can provide a more comprehensive understanding of these dynamics.

In conclusion, enhancing financial well-being through improved financial literacy, which enhance financial knowledge, strong financial attitude, and positive financial behaviours is not only beneficial for individuals' economic stability but also contributes to broader environmental sustainability goals. Policymakers and educators should prioritize financial education and support systems that promote financial well-being as a strategy to achieve sustainable development objectives. The study enhances literature on financial literacy, well-being, and environmentally sustainable behaviour, providing theoretical and practical implications, while identifying limitations and recommending future research.

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Appendix

Table A1. Statements for Each Construct and Item and Their Sources

Constructs	Items	Statements	Sources
Financial Awareness	FAw1	It is important to invest regularly to achieve financial targets in the long term.	Katini and Amalanathan (2022)
	FAw2	I am aware of provisions like home loans, car loans, and education loans provided by banks.	
	FAw3	I am aware of various insurance/ takaful such as health, life, motor vehicle, etc.	
	FAw4	I am aware of provisions such as the employee provident fund (EPF).	
Financial Knowledge	FK1	I have knowledge about financial risks.	Katini and Amalanathan (2022)
	FK2	I know about the benefits associated with financial products or services (e.g., profit return).	
	FK3	I know the costs (e.g., interest, charge) associated with financial products or services (e.g., investment).	
	FK4	I know to handle financial matters.	
Financial Attitude	FAtt1	I have a good attitude towards saving money.	Katini and Amalanathan (2022)
	FAtt2	It is important to spend money responsibly.	
	FAtt3	I am always interested in financial news.	
	FAtt4	I have a good attitude towards financial matters.	
	FAtt5	It is important to control monthly expenses.	
	FAtt6	It is important to establish financial targets for the future.	
	FAtt7	It is important to save money monthly.	
	FAtt8	It is important to invest regularly to achieve financial targets in the long term.	

Financial Behaviour	FB1	I try to save some of the money I get each month for future use.	Katini and Amalanathan (2022)
	FB2	I analyse my financial condition before a major purchase.	
	FB3	I always try to spend by sticking to my budget.	
	FB4	I try to save regularly to achieve financial goals in the long term.	
	FB5	I try saving more when I have more money.	
Financial Well-Being	FWB1	I have a healthy financial condition.	Renaldo et al. (2020)
	FWB2	I am comfortable dealing with the financial situation.	
	FWB3	I am confident in controlling personal finances.	
	FWB4	I am satisfied with my overall financial situation.	
	FWB5	I have enough money in my emergency fund.	
Environmentally Sustainable Behaviour	ESB1	I am able to protect the environment and nature.	Katini and Amalanathan (2022)
	ESB2	I am able to contribute to climate change promotion.	
	ESB3	I always use water consciously.	
	ESB4	My family uses more natural resources that do not threaten the health and well-being of people in future.	
	ESB5	I am able to change my lifestyle and reduce wastes (throwing less food or not wasting materials).	
	ESB6	I am able to reuse things as much as I can.	