

Financial Literacy, Inclusion, and Behavior: Impacts on Economic Sustainability of Indonesian Migrant Workers in Sabah

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ABSTRACT

Indonesian Migrant Workers (IMWs) contribute significantly to the national economy through remittances; however, limited financial capability often constrains their long-term economic sustainability. This study aims to examine the effects of Financial literacy, inclusion, and behavior: financial literacy and financial inclusion on Impacts on economic sustainability of economic sustainability, with financial Indonesian migrant workers in Sabah. behavior acting as a mediating variable among IMWs in Sabah, Malaysia. A quantitative survey approach was employed using proportionate cluster random sampling. Data were collected from 398 respondents and analyzed using SPSS and Structural Equation Modeling (SEM) with AMOS. The results reveal that financial literacy significantly influences economic sustainability ($b = 0.116$; $p = 0.037$), while financial inclusion shows a stronger direct effect ($b = 0.552$; $p < 0.001$). Financial behavior also significantly affects economic sustainability ($b = 0.333$; $p < 0.001$). Furthermore, financial behavior significantly mediates the relationships between financial literacy and economic sustainability ($b = 0.062$; Sobel = 2.466) and between financial inclusion and economic sustainability ($b = 0.167$; Sobel = 3.470). These findings highlight the importance of strengthening financial capability and inclusive access to financial services to enhance the long-term economic resilience of IMWs.

Keywords: Economic Sustainability; Financial Behavior; Financial Inclusion; Financial Literacy; Migrant Workers

JEL Classification: G50, G53, O15, J61

INTRODUCTION

Indonesian Migrant Workers (IMWs) play a significant role in supporting both the Indonesian economy and household welfare through remittances sent to their families. Remittances contribute not only to household consumption but also to poverty reduction, financial resilience, and economic development in migrant-origin communities (Demirgüç-Kunt et al., 2022; Saha & Qin, 2023). In many developing countries, including Indonesia, migrant workers rely heavily on cross-border financial transactions, digital payments, and informal financial arrangements to manage their income and support dependents. However, despite the increasing volume of remittances and financial service access, many migrant workers continue to face financial vulnerability due to limited financial capability and inadequate long-term financial planning (Teoh et al., 2026).

Financial literacy has increasingly been recognized as an essential determinant of individual financial well-being and sustainable economic outcomes. Financial literacy refers to the knowledge, confidence, and ability to make effective financial decisions regarding saving, budgeting, borrowing, investing, and risk management (Atkinson & Messy, 2021; Khan et al., 2022). Previous studies demonstrate that individuals with higher financial literacy tend to exhibit better financial behavior, stronger financial resilience, and improved economic well-being (Ananda et al., 2024; Bai, 2023). Among vulnerable populations, including migrant workers, financial literacy becomes even more important because they frequently encounter unstable income, limited social protection, and restricted access to formal financial education (Xue et al., 2019). Low levels of financial literacy may lead to excessive consumption, poor budgeting practices, and dependence on informal financial systems, ultimately weakening long-term economic sustainability.

In addition to financial literacy, financial inclusion also plays a crucial role in improving economic well-being. Financial inclusion refers to the accessibility and effective use of formal financial services such as savings accounts, digital payments, credit, and insurance (Allen et al., 2022; World Bank, 2022). Recent technological developments, particularly fintech and digital payment systems, have accelerated financial inclusion among low-income and migrant populations by enabling more affordable and efficient financial transactions (Gafoor & Amilan, 2024; Hou et al., 2021). Studies indicate that greater financial inclusion enhances household welfare, poverty alleviation, and economic resilience by improving access to financial resources and reducing financial exclusion (Abokyi & Bettin, 2025; Aji & Adawiyah, 2022; Koomson et al., 2026). Nevertheless, access to financial services alone may not guarantee positive financial outcomes if individuals lack sufficient financial literacy and responsible financial behavior (Ghosh, 2025; Kandpal, 2024).

Financial behavior represents the practical implementation of financial knowledge and access in daily financial decision-making. Responsible financial behavior includes budgeting, saving regularly, controlling spending, and making prudent borrowing and investment decisions (Owusu et al., 2024). Prior studies have shown that financial behavior mediates the relationship between financial literacy and financial well-being, suggesting that knowledge alone is insufficient unless translated into appropriate financial actions (Sirait et al., 2025; Teoh et al., 2026). For migrant workers, financial behavior is often influenced by family obligations, remittance commitments, and unstable employment conditions, which may encourage short-term consumption rather than long-term financial planning (Lestari et al., 2023). Therefore, strengthening positive financial

behavior is essential to enhance financial resilience and sustainable livelihoods among migrant workers.

Economic sustainability refers to the ability of individuals or households to maintain long-term financial stability, resilience, and well-being while effectively managing economic risks and resources (United Nations Development Programme [UNDP], 2022). In the context of migrant workers, economic sustainability can be reflected in income stability, savings accumulation, productive investments, and the ability to withstand economic shocks. Recent studies emphasize that financial literacy, financial inclusion, and financial behavior are important determinants of sustainable economic outcomes (Dash & Mohanta, 2024). However, empirical studies examining the interrelationships among these variables in the context of Indonesian migrant workers remain limited, particularly for IMWs working in Sabah, Malaysia. Most previous studies focus separately on financial literacy or financial inclusion without examining the mediating role of financial behavior in shaping economic sustainability outcomes.

This research examines how financial knowledge and access to financial services affect the economic well-being of Indonesian migrant workers in Sabah, Malaysia, and how their financial behavior contributes to this. By combining ideas about financial ability and behavior, this study helps us understand how migrant workers can achieve sustainable economic outcomes and offers policymakers guidance for improving programs that help migrants manage their finances more effectively.

LITERATURE REVIEW

Theory of Planned Behavior (TPB)

The TPB, developed by Ajzen (1991), provides a strong theoretical foundation for understanding and predicting individual financial behavior. According to this theory, human behavior is determined by three key components: attitude toward the behavior, subjective norms, and perceived behavioral control. These components shape an individual's intention, which in turn influences actual behavior.

In the context of financial management, TPB suggests that a person's financial decisions, such as saving, spending, borrowing, or investing, are influenced by their attitudes toward financial practices, perceived social pressures, and perceived ability to manage finances effectively. Financial literacy enhances both attitude and perceived behavioral control by providing knowledge and confidence in financial decision-making. Similarly, financial inclusion supports behavioral intention by enabling access to financial services that make positive financial behavior more achievable. Therefore, TPB serves as a theoretical foundation to explain how financial literacy and financial inclusion influence financial behavior, which ultimately affects economic sustainability.

Sustainable Livelihoods Framework (SLF)

The SLF was introduced by the Department for International Development [DFID] (1999) to explain how individuals or communities sustain their livelihoods through the optimal use of available assets and capabilities. The framework emphasizes five key forms of capital: human, financial, social, physical, and natural. Sustainable livelihoods are achieved when individuals can utilize these capitals efficiently to cope with shocks, adapt to changes, and maintain or enhance their income and well-being over time.

In this study, the economic sustainability of migrant workers is conceptualized based on the SLF perspective. Financial literacy and financial inclusion represent important aspects of human and financial capital that empower migrant workers to manage their

income, reduce vulnerability, and build long-term financial stability. Meanwhile, financial behavior acts as an enabling mechanism that transforms these capitals into sustainable economic outcomes. Thus, SLF provides the theoretical rationale for linking financial literacy, inclusion, and behavior with economic sustainability among Indonesian migrant workers in Sabah.

Financial Literacy

Financial literacy is a multidimensional concept that goes beyond basic financial knowledge to encompass the skills, confidence, and abilities needed to make effective financial decisions in real-life situations. According to [Klapper and Lusardi \(2020\)](#), it involves understanding key financial concepts such as interest rates, inflation, and risk diversification, which are crucial for informed decision-making. More recent perspectives also emphasize the importance of financial attitudes and self-efficacy in shaping how individuals apply their knowledge in practice. For migrant workers, financial literacy is particularly important due to the complexities of managing cross-border finances, including remittances and currency exchange. Low financial literacy often leads to poor financial decisions, while higher literacy encourages budgeting, saving, and investing. Furthermore, [Kyeyune and Ntayi \(2025\)](#) highlight the role of financial literacy in reducing financial vulnerability and strengthening resilience, making it a strategic capability for achieving long-term economic sustainability.

Financial Inclusion

Financial inclusion refers to the availability, accessibility, and effective use of affordable financial services that meet the needs of individuals and businesses. The [World Bank \(2022\)](#) defines it as access to useful and affordable financial products, such as payments, savings, credit, and insurance, delivered responsibly and sustainably. Beyond mere access, recent literature highlights the importance of active usage and service quality. [Demirgüç-Kunt et al. \(2022\)](#) emphasize that true financial inclusion occurs when individuals not only access financial institutions but also use these services to enhance their financial well-being. This is particularly relevant for migrant workers, who often face barriers such as legal status, documentation requirements, and geographic limitations. The rise of digital financial services, including mobile banking and fintech, has expanded inclusion by enabling low-cost remittances and secure transactions. However, without sufficient financial literacy, access alone may not yield optimal outcomes, underscoring the importance of financial inclusion as a key driver of sustainable financial behavior and economic stability.

Financial Behavior

Financial behavior refers to the actual actions and decisions individuals take in managing their financial resources, including spending, saving, borrowing, and investing. [Xue et al. \(2019\)](#) define financial behavior as a function of financial knowledge, attitudes, and external influences, reflecting how individuals translate financial capability into practice. From a behavioral perspective, financial actions are shaped not only by rational considerations but also by psychological and social factors, including self-control, risk tolerance, peer influence, and cultural norms. The TPB ([Ajzen, 1991](#)) explains that behavior is driven by intention, which is influenced by attitudes, subjective norms, and perceived control. For migrant workers, financial behavior is often shaped by socioeconomic pressures such as remittance obligations and income instability. Consequently, promoting responsible financial practices like saving and budgeting is crucial. Empirical evidence shows that sound financial behavior enhances financial well-being and supports long-term economic sustainability outcomes.

Economic Sustainability

Economic sustainability refers to the ability of an individual or household to maintain financial stability and well-being over time while effectively managing resources and minimizing exposure to economic risk. According to [Munisamy \(2022\)](#), this involves preserving and enhancing capital to ensure long-term well-being without compromising future opportunities. In personal finance, economic sustainability encompasses income stability, saving and investment capacity, financial resilience, and long-term security. It reflects not only current financial conditions but also the ability to withstand shocks, adapt to change, and achieve future goals. For migrant workers, this depends on how effectively income and remittances are managed, shifting from short-term consumption to productive savings and investment. This perspective aligns with the SLF ([DFID, 1999](#)), which emphasizes the transformation of financial capital into sustainable resilience. Furthermore, economic sustainability is shaped by financial capacity, institutional access, and behavior, making it a comprehensive indicator of long-term financial well-being and stability.

Hypotheses Development

Financial Literacy and Economic Sustainability

Financial literacy is widely recognized as an important determinant of individual economic sustainability because it improves the ability to manage financial resources effectively and make informed financial decisions. Individuals with higher financial literacy tend to possess better knowledge regarding budgeting, saving, investment, debt management, and financial risk mitigation, which contribute to long-term financial stability and resilience ([Atkinson & Messy, 2021](#); [Lusardi et al, 2021](#)). Previous empirical studies have consistently demonstrated that financial literacy positively influences financial well-being and economic resilience by encouraging individuals to engage in prudent financial practices and future-oriented financial planning ([Kuutol, 2025](#)).

In the context of migrant workers, financial literacy becomes increasingly important due to unstable income conditions, remittance obligations, and limited access to financial education and protection systems. Migrant workers with adequate financial literacy are more capable of allocating income productively, building savings, and preparing for economic uncertainty, thereby improving their long-term economic sustainability ([Teoh et al., 2026](#)). Furthermore, the SLF explains that financial knowledge represents a form of human capital that enhances individuals' capacity to utilize financial resources efficiently and strengthen livelihood resilience. Therefore, based on both theoretical arguments and empirical evidence, this study proposes the following hypothesis:

H1: Financial literacy has a positive and significant effect on economic sustainability.

Financial Inclusion and Economic Sustainability

Financial inclusion is considered an important factor in promoting economic sustainability because it enables individuals to access and utilize formal financial services effectively. Access to banking services, savings accounts, digital payments, credit facilities, and insurance allows individuals to manage financial resources more efficiently, reduce financial vulnerability, and improve long-term economic resilience ([Aji & Adawiyah, 2022](#); [Demirgüç-Kunt et al., 2022](#); [World Bank, 2022](#)). Previous studies have shown that financial inclusion contributes significantly to household welfare, poverty reduction, and financial stability by facilitating the accumulation of savings, productive investments, and better financial planning ([Koomson et al., 2026](#); [Saha & Qin, 2023](#)).

In the context of migrant workers, financial inclusion is particularly important because migrant populations often face barriers in accessing formal financial systems, including

limited documentation, geographical constraints, and high remittance transaction costs. Greater access to inclusive financial services, especially digital banking and fintech-based remittance systems, can improve the ability of migrant workers to manage income securely and support sustainable economic outcomes (Abokyi & Bettin, 2025; Gafoor & Amilan, 2024). Furthermore, the SLF emphasizes that access to financial capital and institutional support strengthens livelihood strategies and enhances long-term economic resilience. Therefore, based on theoretical perspectives and previous empirical findings, this study proposes the following hypothesis:

H2: Financial inclusion has a positive and significant effect on economic sustainability.

Financial Behavior and Economic Sustainability

Financial behavior is an important determinant of economic sustainability because it reflects how individuals manage their financial resources through activities such as budgeting, saving, spending control, borrowing, and investment decisions. Positive financial behavior enables individuals to allocate income efficiently, prepare for unexpected financial risks, and achieve long-term financial stability (Mutambara & Kader, 2025). Previous empirical studies have demonstrated that responsible financial behavior significantly improves financial well-being, financial resilience, and household economic sustainability (Owusu et al., 2024). Individuals who regularly save, manage debt prudently, and practice disciplined financial planning are more likely to maintain stable economic conditions and withstand financial shocks.

In the context of migrant workers, financial behavior becomes particularly important because migrant workers often face irregular income patterns, remittance obligations, and financial pressures from family responsibilities. Positive financial behavior helps migrant workers utilize their income more productively and avoid excessive consumption that may threaten long-term financial security (Teoh et al., 2026). Furthermore, the TPB explains that individuals with stronger financial intentions and perceived behavioral control are more likely to engage in responsible financial actions that support sustainable economic outcomes. Therefore, based on theoretical arguments and previous empirical evidence, this study proposes the following hypothesis:

H3: Financial behavior has a positive and significant effect on economic sustainability.

Financial Literacy and Financial Behavior

Financial literacy is widely acknowledged as a key factor influencing individual financial behavior because it enhances people's understanding and ability to manage financial resources effectively. Individuals with higher financial literacy tend to possess better knowledge regarding budgeting, savings, investment, debt management, and financial planning, which encourages them to adopt more responsible financial practices (Atkinson & Messy, 2021; Lusardi et al., 2021). Previous empirical studies have consistently shown that financial literacy positively affects financial behavior by promoting disciplined saving habits, prudent spending, and effective financial decision-making (Bai, 2023; Wuisang et al., 2023). Financially literate individuals are also more likely to evaluate financial risks carefully and engage in long-term financial planning that supports financial stability.

In the context of migrant workers, financial literacy becomes particularly important because they frequently encounter unstable income, remittance obligations, and limited access to formal financial education. Adequate financial knowledge can help migrant workers avoid excessive consumption and improve their ability to manage income productively (Teoh et al., 2026; Xue et al., 2019). Furthermore, the TPB explains that

knowledge contributes to the formation of positive attitudes and perceived behavioral control, which subsequently influence behavioral intentions and actual financial practices. Therefore, based on previous theoretical and empirical findings, this study proposes the following hypothesis:

H4: Financial literacy has a positive and significant effect on financial behavior.

Financial Inclusion and Financial Behavior

Financial inclusion is considered an important factor influencing financial behavior because access to formal financial services enables individuals to manage their finances more effectively and adopt responsible financial practices. Individuals who have access to banking services, digital payment systems, savings accounts, and credit facilities are more likely to engage in positive financial behaviors such as saving regularly, budgeting, and conducting financial transactions through formal institutions (Aji & Adawiyah, 2022; Demirgüç-Kunt et al., 2022; World Bank, 2022). Previous studies have shown that financial inclusion significantly improves financial decision-making and encourages healthier financial management behavior by increasing individuals' interaction with formal financial systems (Allen et al., 2022; Kandpal, 2024).

In the context of migrant workers, financial inclusion is particularly important because access to affordable remittance services, digital banking, and savings facilities helps workers manage income more securely and efficiently. Financial inclusion also reduces dependence on informal financial channels that may expose migrant workers to financial risks (Dash & Mohanta, 2024; Gafoor & Amilan, 2024). From the perspective of the TPB, access to financial services enhances perceived behavioral control, which subsequently strengthens individuals' intentions to engage in responsible financial practices. Therefore, based on theoretical arguments and previous empirical findings, this study proposes the following hypothesis:

H5: Financial inclusion has a positive and significant effect on financial behavior.

Mediating Role of Financial Behavior

Financial behavior is considered an important mediating mechanism linking financial literacy and financial inclusion to economic sustainability because financial knowledge and financial access alone may not directly improve long-term financial well-being unless they are translated into responsible financial practices. Individuals with higher financial literacy generally possess a better understanding of budgeting, saving, investing, and financial planning, which encourages positive financial behavior such as disciplined saving, prudent spending, and effective debt management (Shi et al., 2025). Likewise, greater financial inclusion provides individuals with access to formal financial services that facilitate better financial management and support healthier financial behavior patterns (Allen et al., 2022; Demirgüç-Kunt et al., 2022). Previous empirical studies have demonstrated that financial behavior significantly mediates the relationship between financial capability and economic well-being because responsible financial practices strengthen financial resilience and long-term economic sustainability (Owusu et al., 2024; Teoh et al., 2026).

In the context of migrant workers, financial behavior becomes crucial because workers must manage remittances, unstable income, and household financial obligations effectively to maintain economic security. The TPB further explains that financial knowledge and financial access shape attitudes and perceived behavioral control, which subsequently influence financial behavior and economic outcomes. Therefore, based on

theoretical perspectives and empirical findings, this study proposes the following hypotheses:

H6: Financial behavior mediates the effect of financial literacy on economic sustainability.
H7: Financial behavior mediates the effect of financial inclusion on economic sustainability.

Conceptual Framework

The study framework model is depicted in Figure 1.

Figure 1. Research Framework

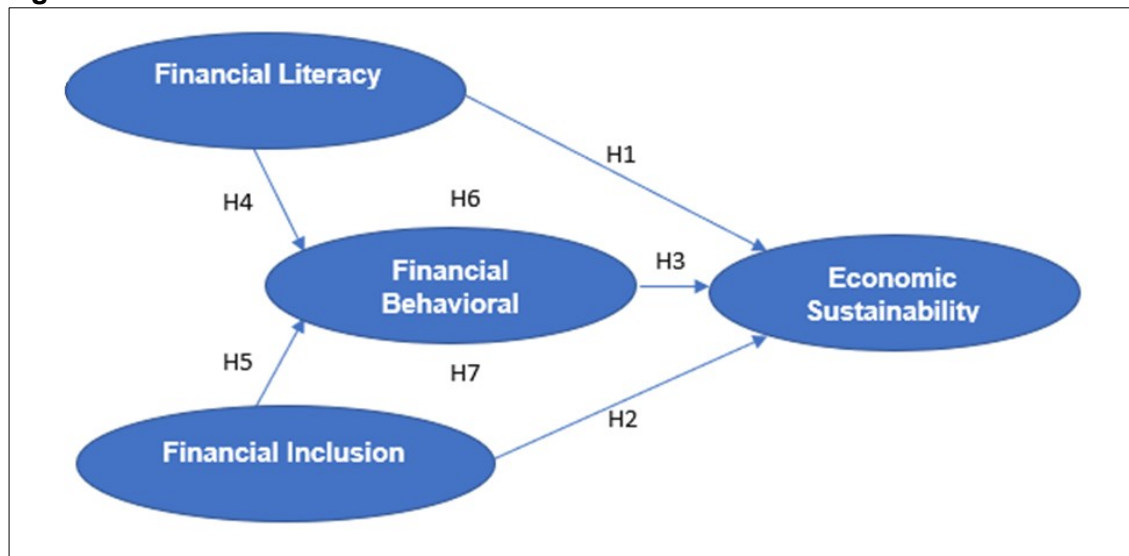


Figure 1 illustrates the conceptual framework of the study, which examines the relationships among financial literacy, financial inclusion, financial behavior, and economic sustainability among IMWs in Sabah, Malaysia. This model is grounded in the TPB and the SLF, which emphasize that financial knowledge, access to financial resources, and responsible financial practices are essential factors in achieving long-term economic resilience and sustainability. Through this framework, the study seeks to explain how financial capability and financial access contribute to sustainable economic outcomes both directly and indirectly through financial behavior.

RESEARCH METHOD

Research Design

This study employed a quantitative research design using a cross-sectional survey approach to examine the relationships among financial literacy, financial inclusion, financial behavior, and economic sustainability among IMWs in Sabah, Malaysia. The study was designed to test both direct and indirect relationships among the proposed variables using SEM. The conceptual framework was developed based on the TPB and the SLF, which provide theoretical support for understanding how financial capability and financial access contribute to sustainable economic outcomes.

Population and Sampling

The population of this study consisted of Indonesian Migrant Workers residing and working in various regions of Sabah, Malaysia. Due to the broad geographical distribution of the population, Proportional Cluster Random Sampling was employed to ensure adequate representation from different regional clusters. Sabah was divided into seven

regional clusters, namely Kota Kinabalu, Sandakan, Tawau, Lahad Datu, Keningau, Kudat, and Beaufort. The sample size was determined based on the requirements of SEM analysis, which recommends an adequate number of observations to ensure reliable parameter estimation and model stability. A total of 398 respondents participated in the study.

To support the implementation of proportional cluster random sampling, respondents were distributed across seven regional clusters in Sabah, Malaysia, as presented in [Table 1](#).

Table 1. Distribution of Respondents by Regional Cluster

Regional Cluster	Frequency	Percentage (%)
Kota Kinabalu	68	17.1
Sandakan	57	14.3
Tawau	74	18.6
Lahad Datu	51	12.8
Keningau	46	11.6
Kudat	49	12.3
Beaufort	53	13.3
Total	398	100

Instruments and Measures

Data were collected using a structured questionnaire adapted from established instruments in previous studies. All measurement items were assessed using a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Financial literacy was measured through indicators related to financial knowledge, understanding of savings and investment, debt management, budgeting capability, and financial planning. Financial inclusion was assessed through indicators reflecting access to and utilization of formal financial services, including banking services, digital financial platforms, savings products, credit facilities, and remittance services. Financial behavior was measured through indicators associated with budgeting practices, saving behavior, expenditure control, debt management, and long-term financial planning. Economic sustainability was measured using indicators related to financial stability, savings capacity, financial resilience, income management, and the ability to achieve long-term financial well-being.

Data Analysis

Data analysis was conducted using IBM SPSS and AMOS software. The analysis proceeded in several stages. First, descriptive statistics were used to summarize respondents’ demographic characteristics. Second, Confirmatory Factor Analysis (CFA) was performed to assess the validity and reliability of the measurement model. Convergent validity was evaluated using standardized factor loadings and Average Variance Extracted (AVE), while reliability was assessed using Composite Reliability (CR). Third, the overall model fit was examined using multiple goodness-of-fit indices, including Chi-square/df (CMIN/DF), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Finally, SEM was employed to test the proposed hypotheses and evaluate both direct and indirect relationships among the study variables. The mediating effect of financial behavior was assessed using the Sobel test to determine the significance of indirect effects.

RESULTS

Respondents' Demographic Profile

The respondents in this study were IMWs residing and working in various regions of Sabah, Malaysia, under the jurisdiction of the Consulate General of the Republic of Indonesia (KJRI) in Kota Kinabalu. A total of 398 respondents participated in the survey. The demographic characteristics of the respondents are summarized as follows:

Table 2. Respondent Profile

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	231	58
	Female	167	42
Age	20–30 years	124	31.2
	31–40 years	173	43.5
	Above 40 years	101	25.3
Education Level	Elementary School	52	13.1
	Junior High School	89	22.4
	Senior High School	198	49.7
	Diploma/Bachelor's Degree	59	14.8
Marital Status	Married	286	71.9
	Single	94	23.6
	Others	18	4.5
Length of Employment in Sabah	< 5 years	118	29.6
	5–10 years	176	44.2
	> 10 years	104	26.2

Table 2 shows the demographic characteristics of the 398 IMWs who participated in this study. The majority of respondents were male (58.0%), while female respondents accounted for 42.0%. In terms of age, most respondents were between 31 and 40 years old (43.5%), followed by those aged 20–30 years (31.2%) and those above 40 years (25.3%). Regarding educational attainment, nearly half of the respondents had completed senior high school education (49.7%), followed by junior high school graduates (22.4%), diploma or bachelor's degree holders (14.8%), and elementary school graduates (13.1%). These findings indicate that the respondents were predominantly of productive working age and possessed educational backgrounds that may support their ability to understand and utilize financial information.

In **Table 2**, the marital status distribution indicates that most respondents were married (71.9%), while 23.6% were single and 4.5% reported other marital statuses. With respect to employment duration in Sabah, 44.2% of respondents had worked in Sabah for 5–10 years, followed by 29.6% who had worked for less than five years and 26.2% who had worked for more than ten years. The relatively high proportion of married workers and respondents with substantial work experience suggests that the sample largely consisted of individuals with long-term economic responsibilities and considerable exposure to financial decision-making in the migrant worker context.

Measurement Model

The measurement model was evaluated prior to testing the structural relationships to ensure the validity and reliability of the latent constructs. Financial Literacy (FL), Financial Inclusion (FI), Financial Behavior (FB), and Economic Sustainability (ES) were measured using multiple indicators adapted from relevant literature and subsequently assessed through CFA using AMOS. The CFA procedure was conducted to validate the measurement model by examining indicator validity, construct reliability, and overall

model fit, thereby confirming that the observed indicators adequately represented their respective latent variables before proceeding to structural model analysis.

Table 3. Confirmatory Factor Analysis Results

Variable	Indicator Loading Factor	CR	AVE	Remarks
Financial Literacy	0.651–0.842	0.887	0.612	Valid & Reliable
Financial Inclusion	0.673–0.861	0.901	0.645	Valid & Reliable
Financial Behavior	0.688–0.874	0.913	0.676	Valid & Reliable
Economic Sustainability	0.702–0.889	0.921	0.701	Valid & Reliable

Table 3 demonstrates that all indicators achieved standardized loading factors above 0.50, indicating satisfactory convergent validity. Composite Reliability (CR) values for all constructs exceeded 0.70, while AVE values were above 0.50. These findings confirm that all constructs met the validity and reliability requirements and were appropriate for further structural analysis.

Model Fit Evaluation

Table 4. Goodness-of-Fit Indices

Goodness-of-Fit Index	Cut-off Value	Result	Model Evaluation
Chi-square/df (CMIN/DF)	≤ 3.00	1.874	Good Fit
GFI	≥ 0.90	0.921	Good Fit
AGFI	≥ 0.90	0.903	Good Fit
CFI	≥ 0.90	0.957	Good Fit
TLI	≥ 0.90	0.948	Good Fit
RMSEA	≤ 0.08	0.047	Good Fit

Table 4 indicates that the structural model achieved acceptable goodness-of-fit criteria. The CMIN/DF value of 1.874 was below the recommended threshold of 3.00, while GFI, AGFI, CFI, and TLI values exceeded 0.90. In addition, the RMSEA value of 0.047 was below 0.08, confirming that the model demonstrated a satisfactory fit with the empirical data.

Structural Model

The evaluation of the structural model was conducted using SEM with AMOS to assess the direct causal relationships among the constructs: FL, FI, FB, and ES. The analysis included testing the model's goodness-of-fit indices, path coefficients, and hypothesis testing.

Direct Effect Hypotheses

The results of the direct effect hypothesis testing are summarized in Table 5.

Table 5. Direct Effect Hypothesis Testing Results

	Hypothesis	Estimate	S.E.	C.R.	p-value	Result
H1	Financial Literacy → Economic Sustainability	0.116	0.056	2.087	0.037	Supported
H2	Financial Inclusion → Economic Sustainability	0.552	0.104	5.304	0.000	Supported
H3	Financial Behavior → Economic Sustainability	0.333	0.062	5.402	0.000	Supported
H4	Financial Literacy → Financial Behavior	0.186	0.067	2.784	0.005	Supported
H5	Financial Inclusion → Financial Behavior	0.500	0.110	4.565	0.000	Supported

Table 5 shows that all hypothesized direct relationships were statistically significant. Financial literacy had a positive and significant effect on economic sustainability ($\beta = 0.116$, $p = 0.037$), supporting H1. Financial inclusion demonstrated a stronger positive effect on economic sustainability ($\beta = 0.552$, $p < 0.001$), supporting H2. Financial behavior also positively influenced economic sustainability ($\beta = 0.333$, $p < 0.001$), supporting H3. In addition, financial literacy had a significant positive effect on financial behavior ($\beta = 0.186$, $p = 0.005$), supporting H4, whereas financial inclusion had a significant positive effect on financial behavior ($\beta = 0.500$, $p < 0.001$), supporting H5. These results indicate that all proposed direct relationships in the structural model were supported.

The results of the mediation analysis are presented in Table 6.

Table 6. Mediation Effect Results

Hypothesis		Estimate	a	b	SEa	SEb	Sobel Test	Result
H6	Financial Literacy → Financial Behavior → Economic Sustainability	0.062	0.186	0.333	0.067	0.062	2.466	Supported
H7	Financial Inclusion → Financial Behavior → Economic Sustainability	0.167	0.500	0.333	0.110	0.062	3.470	Supported

Table 6 presents the results of the mediation analysis. The indirect effect of financial literacy on economic sustainability through financial behavior was significant ($\beta = 0.062$; Sobel test = 2.466), supporting H6. Similarly, financial behavior significantly mediated the relationship between financial inclusion and economic sustainability, with an indirect effect of 0.167 and a Sobel test value of 3.470, supporting H7. The results indicate that financial behavior serves as a significant mediating variable in the relationships between financial literacy and economic sustainability, as well as between financial inclusion and economic sustainability.

DISCUSSION

The Effect of Financial Literacy on Economic Sustainability

The results indicate that financial literacy has a positive and significant effect on economic sustainability ($\beta = 0.116$; $p = 0.037$); therefore, H1 is supported. This finding suggests that migrant workers with better financial knowledge and understanding are more capable of maintaining long-term financial stability and resilience. Financial literacy enables individuals to make informed decisions regarding budgeting, saving, borrowing, and investment activities, which ultimately contribute to sustainable economic outcomes. This result is consistent with previous studies by Ananda et al. (2024), Atkinson & Messy (2021), and Bai (2023), which found that higher financial literacy significantly improves financial well-being and economic resilience.

Among migrant workers, financial literacy becomes particularly important because they often face unstable income conditions, limited financial protection, and complex remittance management systems. From the perspective of the SLF, financial literacy can be viewed as an important human capital asset that strengthens individuals' ability to manage financial resources effectively and improve long-term livelihood sustainability. Migrant workers who possess adequate financial knowledge are better positioned to transform their financial capital into productive economic resources that support

household resilience and future welfare. Theoretically, this finding supports the financial capability perspective, which emphasizes that financial knowledge is a key determinant of long-term economic sustainability. In practical terms, the finding highlights the importance of strengthening financial education programs for Indonesian migrant workers before and during overseas employment.

The Effect of Financial Inclusion on Economic Sustainability

The findings reveal that financial inclusion has a positive and significant effect on economic sustainability ($\beta = 0.552$; $p < 0.001$); thus, H2 is supported. This result indicates that access to formal financial services, such as banking, digital payments, savings, and credit facilities, substantially improves the economic resilience of migrant workers. Financial inclusion enables individuals to manage their income more efficiently, reduce transaction costs, and build financial security through formal financial systems. This finding aligns with studies conducted by [Abokyi & Bettin \(2025\)](#), [Demirgüç-Kunt et al. \(2022\)](#), and [Saha & Qin \(2023\)](#), which demonstrate that financial inclusion contributes significantly to household welfare and poverty reduction. Furthermore, the rapid development of fintech and digital financial services has expanded access to financial products among low-income and migrant populations.

In relation to the SLF, financial inclusion represents an institutional support mechanism that enhances access to financial capital, allowing migrant workers to strengthen their livelihood strategies and reduce economic vulnerability. Access to formal financial services helps migrant workers allocate remittances more productively, improve savings capacity, and increase financial resilience against unexpected economic shocks. Theoretically, this finding reinforces the argument that inclusive financial systems serve as an essential foundation for sustainable economic development. From a practical perspective, policymakers and financial institutions should continue expanding affordable and accessible financial services tailored to the needs of migrant workers, particularly in cross-border financial transactions and remittance services.

The Effect of Financial Behavior on Economic Sustainability

The study also found that financial behavior has a positive and significant effect on economic sustainability ($\beta = 0.333$; $p < 0.001$); therefore, H3 is supported. This finding indicates that responsible financial practices, such as budgeting, saving regularly, controlling expenditures, and managing debt prudently, are important determinants of long-term financial stability among migrant workers. Positive financial behavior allows individuals to allocate income more effectively and prepare for future uncertainties. This result is consistent with the findings of [Chhatwani & Mishra \(2021\)](#), [Owusu et al. \(2024\)](#), and [Teoh et al. \(2026\)](#), which emphasize that financial behavior plays a central role in improving financial well-being and economic resilience.

In the context of migrant workers, financial behavior is influenced by family obligations, remittance responsibilities, and income instability, which may encourage short-term consumption patterns. This finding is also consistent with the TPB, which explains that individual behavior is shaped by attitudes, subjective norms, and perceived behavioral control. Migrant workers who possess positive attitudes toward financial planning and perceive greater control over their financial resources are more likely to engage in responsible financial behavior that supports sustainable economic outcomes. Therefore, encouraging responsible financial behavior is essential for enhancing sustainable economic outcomes among migrant workers.

The Effect of Financial Literacy on Financial Behavior

The results demonstrate that financial literacy significantly influences financial behavior ($\beta = 0.186$; $p = 0.005$); thus, H4 is supported. This finding suggests that migrant workers with higher levels of financial knowledge are more likely to engage in responsible financial practices. Financial literacy improves individuals' understanding of financial planning, risk management, and savings decisions, which subsequently shape positive financial behavior. This result is in line with studies by [Khan et al. \(2022\)](#), [Sabri et al. \(2023\)](#), and [Xue et al. \(2019\)](#), which found that financially literate individuals tend to demonstrate better money management and financial discipline.

In the migrant worker context, adequate financial literacy may help workers avoid excessive consumption and dependence on informal financial mechanisms. From the TPB perspective, financial literacy contributes to the formation of favorable financial attitudes and stronger perceived behavioral control, which subsequently influence individuals' intentions to perform responsible financial behaviors. Migrant workers with greater financial knowledge are more confident in making financial decisions and managing economic risks effectively. Theoretically, this finding confirms that financial literacy serves as an antecedent of financial behavior within the financial capability framework. Consequently, improving financial literacy is expected to produce long-term behavioral changes that support financial resilience and economic sustainability.

The Effect of Financial Inclusion on Financial Behavior

The findings further indicate that financial inclusion has a positive and significant effect on financial behavior ($\beta = 0.500$; $p < 0.001$); therefore, H5 is supported. This result implies that greater access to formal financial services encourages migrant workers to adopt more responsible financial practices, including saving, financial planning, and controlled spending behavior. Access to banking and digital financial services provides individuals with more efficient tools for managing their financial activities. This finding is consistent with [Aji & Adawiyah \(2022\)](#), [Allen et al. \(2022\)](#), [Gafoor & Amilan \(2024\)](#), and [Kandpal \(2024\)](#), who found that financial inclusion promotes better financial decision-making and financial well-being.

From the TPB perspective, easier access to financial services increases individuals' perceived behavioral control, thereby encouraging stronger intentions to engage in positive financial behavior. Financial inclusion also creates an enabling environment that supports disciplined saving and more structured financial management practices among migrant workers. Theoretically, this result strengthens the argument that financial inclusion not only improves access to financial services but also shapes behavioral outcomes through greater interaction with formal financial institutions. Therefore, increasing financial accessibility among migrant workers can contribute to the development of healthier financial behavior patterns.

The Mediating Role of Financial Behavior

The mediation analysis shows that financial behavior significantly mediates the relationships between financial literacy and economic sustainability, and between financial inclusion and economic sustainability. The indirect effect of financial inclusion through financial behavior ($\beta = 0.167$; Sobel = 3.470) was stronger than the indirect effect of financial literacy through financial behavior ($\beta = 0.062$; Sobel = 2.466). Therefore, H6 and H7 are supported. These findings indicate that financial literacy and financial inclusion contribute to economic sustainability not only directly but also indirectly through improved financial behavior. This result supports prior studies by [Chhatwani & Mishra \(2021\)](#), [Owusu et al. \(2024\)](#), [Sabri et al. \(2023\)](#), and [Teoh et al. \(2026\)](#), which found that

financial behavior acts as an important mechanism linking financial capability to economic well-being. The findings also support the integration of the TPB and the SLF.

TPB explains that financial literacy and financial inclusion shape attitudes and perceived behavioral control, which subsequently influence responsible financial behavior. Meanwhile, SLF emphasizes that the effective utilization of financial knowledge and access to financial resources strengthen livelihood strategies and long-term economic resilience. The results imply that enhancing financial literacy and financial inclusion alone may not be sufficient unless accompanied by behavioral changes that encourage responsible financial management practices.

Practical Implications

This study provides several practical implications for policymakers, financial institutions, and organizations concerned with migrant worker welfare. First, financial education programs for Indonesian migrant workers should be strengthened through continuous training on budgeting, savings management, debt control, and investment planning before and during overseas employment. Second, financial institutions and governments should expand inclusive financial services tailored to migrant workers, particularly affordable digital banking, remittance systems, and savings products that are easily accessible across borders. Third, behavior-based financial empowerment programs should be developed to encourage long-term financial planning and responsible spending habits among migrant workers. Finally, collaboration between governments, labor agencies, and financial service providers is necessary to create sustainable financial ecosystems that support the economic resilience and long-term well-being of Indonesian migrant workers and their families.

CONCLUSION

This study aimed to examine the effects of financial literacy and financial inclusion on economic sustainability among IMWs in Sabah, Malaysia, with financial behavior serving as a mediating variable. The findings reveal that financial literacy, financial inclusion, and financial behavior each have a positive and significant direct effect on economic sustainability. Among these factors, financial inclusion emerged as the strongest predictor of economic sustainability, indicating that access to formal financial services plays a critical role in improving the long-term financial resilience and well-being of migrant workers. The results also demonstrate that financial literacy and financial inclusion significantly influence financial behavior. These findings confirm the importance of both financial capability and financial access in supporting sustainable economic outcomes.

The mediation analysis further shows that financial behavior significantly mediates the relationships between financial literacy and economic sustainability, as well as between financial inclusion and economic sustainability. This finding suggests that financial knowledge and access to financial services contribute more effectively to economic sustainability when they are translated into responsible financial practices, such as budgeting, saving, and prudent financial management. Financial behavior, therefore, serves as an important mechanism through which financial capability and financial access enhance long-term financial well-being. The results provide empirical support for the integration of the TPB and the SLF in explaining economic sustainability among migrant workers.

The findings offer important implications for policymakers, financial institutions, and organizations involved in migrant worker welfare. Governments and labor agencies

should strengthen financial education programs that focus on budgeting, savings management, investment planning, and long-term financial security. Financial institutions should expand accessible and affordable financial services, particularly digital banking, remittance facilities, and cross-border financial products tailored to migrant workers' needs. In addition, behavior-based financial empowerment initiatives should be promoted to encourage responsible financial decision-making and long-term financial resilience. Collaborative efforts among governments, financial institutions, and migrant worker support organizations are essential to build sustainable financial ecosystems that enhance the economic sustainability and welfare of migrant workers and their families.

LIMITATION

This study has several limitations that should be considered when interpreting the findings. First, the data were collected using self-reported questionnaires, which may be subject to response bias and social desirability bias. Respondents may have overestimated or underestimated their financial literacy, financial behavior, or economic conditions, potentially affecting the accuracy of the results.

Second, all variables were measured using a single survey instrument administered at one point in time. Although validity and reliability assessments indicated satisfactory measurement quality, the possibility of common method bias cannot be completely ruled out. Future studies may benefit from incorporating multiple data sources or objective financial indicators to reduce this potential limitation.

Third, the cross-sectional design of the study limits the ability to establish causal relationships among financial literacy, financial inclusion, financial behavior, and economic sustainability. The findings reflect associations observed at a specific point in time and do not capture potential changes in financial behavior or economic conditions over time. Longitudinal studies are therefore recommended to examine how financial capability and financial behavior evolve and influence economic sustainability in the long term.

Finally, this study focused exclusively on Indonesian Migrant Workers residing in Sabah, Malaysia. Consequently, the generalizability of the findings to migrant workers in other countries or different socio-economic contexts may be limited. Future research is encouraged to include broader geographical coverage and comparative analyses across migrant worker populations to enhance the external validity of the findings.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. This study was conducted

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