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Financial literacy, networking, and business performance of women micro-entrepreneurs in Malaysia

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ABSTRACT

The aim of this study is to examine the effects of financial literacy and business networking on the performance of women micro-entrepreneurs in Malaysia, with a focus on participants in the Amanah Ikhtiar Malaysia microcredit program. Financial literacy is conceptualized as financial management, saving, and debt literacy, while business networking is measured by network density, reachability, and centrality. Using survey data from 508 respondents and regression analysis, six hypotheses were tested to explore the relationships between these factors and self-reported business performance. The findings indicate that financial management literacy, saving literacy, network density, and network centrality have significant positive effects on performance, whereas debt literacy has a significant negative effect, and network reachability is not significant. These results suggest that practical financial management skills and cohesive, central networks are crucial for women's entrepreneurial success, while debt literacy does not necessarily translate into better outcomes. The study offers insights for microfinance institutions and policymakers to strengthen financial literacy training and network support to enhance business performance.

1. Introduction

Malaysia has experienced significant economic expansion in recent decades, with women-owned businesses playing an increasingly pivotal role in this growth. According to the Department of Statistics Malaysia (DOSM), there were 187,265 women-owned business establishments in 2015, accounting for about 20.3% of all establishments nationally. These women-run businesses generated RM85.0 billion in gross output (3.4% of the national output) and contributed RM39.6 billion in value added (4.0% of the national total) in that year. This reflects a sharp rise from 2010 levels; DOSM data indicate an average annual growth of around 18% in the value added by women-owned firms over the 2010–2015 period, up from approximately RM17.2 billion in 2010. Sector-wise, agriculture demonstrated the highest growth rate between 2010 and 2015 (about 43.3% per year), followed by manufacturing (33.7%) and services (16.7%) over the five-year period. In absolute terms, the services sector contributed the largest share of women entrepreneurs' value added, reaching RM30.1 billion in 2015. This trend underscores the growing footprint of women entrepreneurs across multiple sectors of the economy (Franzke et al., 2022).

The momentum of entrepreneurial growth has continued unabated. Between 2015 and 2022, Malaysia's Micro, Small, and Medium Enterprises (MSMEs) sector expanded substantially. In 2022, 1,173,601 MSMEs were operating in Malaysia, about 97.4% of all business establishments (1,204,987 firms). This marks an increase of nearly 270,000 enterprises compared to the 907,065 MSMEs recorded in 2015, equivalent to an average annual growth rate of 3.7% over the period. In tandem with this overall MSME growth, the number of women-owned businesses has also risen. The latest Economic Census shows that by 2022, women owned 219,015 business establishments, representing roughly 20% of all businesses. These women-owned firms generated RM136.9 billion in gross output in 2022, up from RM85.0 billion in 2015, and their total value-added output grew from RM39.6 billion to RM61.4 billion over the same

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period. Such statistics highlight not only the growing presence of women entrepreneurs in Malaysia's economy but also their increasing contributions to economic output and employment.

Women constitute a substantial proportion of Malaysia's population and workforce and have been increasingly recognized for their critical contributions to national development. According to the most recent data, Malaysia's female labor force participation rate reached 51.6% in 2023, a slight rise from 50.7% in 2022. The growing involvement of women in education and employment over the past few decades underscores their rising significance in Malaysia's development trajectory. Indeed, women play indispensable roles not only as economic actors but also as partners, mothers, and community builders, nurturing a progressive and resilient future generation. This trend validates earlier observations about women's essential role in facilitating the nation's industrialization and modernization efforts into the 21st century (Keling et al., 2023).

Nevertheless, despite their expanding role and importance, women entrepreneurs often encounter greater challenges compared to their male counterparts. Prior studies have noted that women in business face persistent structural and socio-cultural hurdles, including limited access to capital, skill gaps, and the burden of balancing business demands with family responsibilities (Au et al., 2021). Recognizing these challenges, the Malaysian government and various agencies have implemented numerous strategies and programs to support women's entrepreneurship and alleviate poverty through inclusive economic participation. One prominent initiative is Amanah Ikhtiar Malaysia (AIM), a microfinance program established to spur community development and transformation in rural areas. Many women in Malaysia turn to entrepreneurship to improve family well-being, increase household income, and overcome poverty.

AIM primarily targets very poor, poor, and low-income households, offering benevolent financing through its Sahabat (microcredit group) program. This initiative provides small, sui20 micro-loans designed to improve recipients' financial circumstances and overall quality of life. Over the years, AIM's microfinance efforts have measurably improved living standards nationwide. According to AIM's official reports, as of December 2023, the program had supported over 300,000 Sahabat (borrowers) across Malaysia, with more than 90% of these participants successfully emerging from conditions of poverty. AIM has thus become a leading microfinance institution in the country, actively nurturing entrepreneurship among its borrowers and fostering a supportive ecosystem conducive to the sustainable growth and profitability of Sahabat-owned businesses.

Women entrepreneurs are clearly integral to economic development, yet they face persistent difficulties in juggling the demands of business affairs. Considering this, the objective of the present study is to investigate how two key factors, financial literacy and business networking, influence the business performance of women-owned small and medium enterprises (SMEs) in Malaysia. Drawing on role conflict theory, this research seeks to shed light on the mechanisms through which financial competencies and business networks impact women entrepreneurs' success. Based on the above objectives, this study addresses the following key research questions:

Q1: Is there a relationship between financial literacy (specifically, financial management, saving literacy, and debt literacy) and the business performance of women-led small and medium enterprises in Malaysia?

Q2: Is there a relationship between business networking (in terms of network density, reachability, and centrality) and the business performance of women-led small and medium enterprises in Malaysia?

2. Literature review

2.1. Women-owned SMEs performance in Malaysia

Women entrepreneurs play a vital role in economic development, including in Malaysia, but they remain underrepresented in the SME sector. Those who do start businesses often measure success in terms of tangible growth outcomes, for instance, increases in revenue or profits, higher sales volumes, and expansion of employment. In our context, women's business performance refers to improvements in such metrics (e.g., rising net profits, sales growth, improved personal savings, and expansion of business capacity through assets or staff). These indicators capture both financial gains and the growth of the enterprise, reflecting the entrepreneur's ability to sustain and scale her business. Achieving strong performance is especially important for women-owned SMEs in developing economies like Malaysia, yet prior studies note that many of these ventures struggle or remain small-scale (Keling et al., 2023). Researchers have pointed to skill gaps and resource constraints as key barriers; in particular, deficiencies in financial literacy and limited business networks are often cited as factors impeding the success of women entrepreneurs (Au et al., 2021). The following literature review focuses on these two aspects, examining how financial literacy and business networking relate to women entrepreneurs' performance.

2.2. Financial literacy and women's business performance

Financial literacy encompasses the knowledge and skills needed to manage financial resources effectively. For entrepreneurs, this means understanding how to plan, control, and use money in business, including budgeting, bookkeeping, saving, and debt management. Prior research underscores that financial literacy is critical for the success and survival of small businesses (Andriamahery and Qamruzzaman, 2022). Unfortunately, many women entrepreneurs have low financial literacy levels, which can hinder their business performance. In a recent Malaysian study, most female micro-entrepreneurs were found to lack basic financial management practices; for example, many had not adopted proper accounting systems, kept no clear separation between business and personal accounts, failed to maintain savings, and could not accurately compute costs or pricing for their products (Singla and Mallik, 2021). Such financial illiteracy often leads to poor financial decisions. Tuffour et al. (2022) observed that some women entrepreneurs in Malaysia tend to overspend on lifestyle or mismanage cash flows, eventually resorting to high-interest personal loans that burden the business and increase the risk of failure.

Financial literacy is a multi-dimensional construct. In this study, we consider three key dimensions relevant to women-owned SMEs: financial management literacy, saving literacy, and debt literacy (Al Rahahleh, 2022). Financial management literacy refers to the ability to handle day-to-day financial tasks and make informed decisions on budgeting, bookkeeping, and cash flow management. Saving literacy entails knowledge of the importance of savings and the habit of setting aside funds, while debt literacy means understanding how loans, interest rates, and credit work, enabling prudent borrowing and debt repayment decisions. Each of these aspects can influence business outcomes, as discussed below.

2.2.1. Financial management literacy and performance

Sound financial management practices are fundamentally linked to SME performance. Entrepreneurs with higher financial management literacy are proficient in record-keeping, budgeting, and monitoring expenses versus revenues. This proficiency allows them to allocate resources efficiently and detect financial problems early. Prior studies note that financial management is often a weak point for women entrepreneurs, which can undermine their businesses. Many women-led SMEs do not keep systematic books or distinguish personal and business finances, leading to inefficiencies and leakages of business funds (Aisyah et al., 2024). Poor financial management can result in unplanned expenditures or cash shortages that stall operations. By contrast, women entrepreneurs who develop strong financial management skills are better equipped to control costs, price their products correctly, and maintain profitability. Empirical evidence from various contexts has shown that training in basic accounting and budgeting correlates with improved SME performance. For instance, a study of small manufacturers found that strengthening owners' bookkeeping literacy significantly boosted business performance metrics.

2.2.2. Saving literacy and performance

Saving literacy refers to an entrepreneur's knowledge and attitudes about setting aside financial reserves for future use or emergencies. Having a savings buffer is crucial for micro and small enterprises, which often face volatile sales and unforeseen expenses. Owners with good saving literacy understand the need to reinvest earnings or maintain a cash safety net during slow periods (Kurniasari et al., 2025). This practice can sustain business through downturns and provide capital for growth opportunities. Research suggests that women entrepreneurs who actively save and manage personal or business savings accounts tend to run more resilient ventures (Rahmawati et al., 2023).

In Malaysia, however, many women micro-entrepreneurs do not cultivate regular savings from their business income. The lack of savings can leave them vulnerable to cash flow crises or the inability to respond to increased customer demand (e.g., unable to buy more inventory). On the other hand, a woman entrepreneur with higher savings literacy is likely to ensure a portion of profits is retained, thereby improving liquidity and enabling her to easily settle business expenses or invest in new stock when needed.

2.2.3. Debt literacy and performance

Debt literacy is the understanding of how borrowing and credit work, including knowledge of interest rates, loan terms, and the risks of over-indebtedness. For small businesses, some amount of external financing or credit use may be necessary for expansion, but mismanaging debt can quickly lead to financial distress. Women entrepreneurs often have lower debt literacy than men, which can manifest in costly mistakes like taking on loans without fully grasping the repayment obligations. In Malaysia, many female entrepreneurs rely on personal loans or informal credit; if they do not understand the high interest rates or fees, these debts can erode their profits.

Tumba et al. (2022) pointed out that a tendency to support personal spending through business funds led some women to incur heavy personal loans, ultimately burdening their businesses with steep repayments and risking failure. Entrepreneurs with high debt literacy, by contrast, make more prudent financing choices; they are cautious about borrowing, seeking favorable credit terms, and use debt strategically to generate returns. Evidence from an SME study in Nigeria found that owners' debt literacy had a significant positive effect on business performance, suggesting that understanding how to manage debt and avoid overborrowing is critical for success.

Financial literacy in its various forms is expected to enhance women entrepreneurs' ability to run their businesses effectively. Women who can keep good financial records, save from their earnings, and manage loans wisely should see better business outcomes (higher profits, expanded operations, etc.) than those who lack these skills and habits (Widyastuti et al., 2023). We therefore propose the following hypotheses for the financial literacy dimensions:

H1: Financial management literacy has a positive effect on women entrepreneurs' business performance.
H2: Saving literacy has a positive effect on women entrepreneurs' business performance.
H3: Debt literacy has a positive effect on women entrepreneurs' business performance.

2.3. Business networking and women's business performance

In addition to individual financial skills, the social networks of an entrepreneur are a crucial external factor influencing enterprise performance. Business networking refers to building and maintaining relationships that can provide information, support, and resources for the business. Social network theory and entrepreneurship research have long argued that entrepreneurs' network connections to other business owners, customers, suppliers, mentors, and institutions are key enablers of success (Bhaktiar et al., 2023). Through networks, women entrepreneurs can access new markets, obtain advice, secure financing, or learn of opportunities that they might not find on their own. For women in SMEs, networks can be especially valuable in overcoming gender-specific challenges (like limited access to formal business channels) by leveraging contacts and community support. However, studies indicate that women entrepreneurs often have limited networks compared to men, due to constraints like family responsibilities, social norms, or fewer industry connections (Fakhreddin and Foroudi, 2025). In Malaysia, researchers have observed that poor networking is one of the major causes of weak performance among women-owned micro-enterprises (Falahat et al., 2021). Harisudin and Kusnandar (2025) noted that because women juggle many roles, they may invest less time in networking, which in turn deprives their businesses of valuable information and resources. Indeed, the growth of women's enterprises has been found to be closely tied to the breadth and quality of their social networks (Hsu et al., 2023). Women with richer networks tend to achieve higher business growth, whereas isolation or narrow networks can stunt a firm's progress.

When examining business networks, it is useful to consider structural characteristics of an entrepreneur's network. Three important network structural properties are density, reachability, and centrality. These measures reflect different qualitative aspects of how the network is configured and how it might benefit the entrepreneur. Network density refers to the level of interconnectedness among the contacts in the entrepreneur's network, essentially, how many of one's contacts also know or interact with each other. A dense network means a tight-knit group with many interlinkages, while a less dense (sparser) network consists of contacts who mostly do not know one another. Network reachability captures how easily and widely the entrepreneur can reach other people or nodes in the broader network, even beyond her immediate contacts. High reachability implies that through a few intermediaries, the entrepreneur can access far-flung information or resources; it relates to having short path lengths to many others in the network structure (Kurniawan et al., 2021). Finally, network centrality describes the entrepreneur's positional importance or prominence in the network. An entrepreneur with high centrality is well-connected with many direct ties or occupies a strategic position bridging different groups, whereas someone with low centrality is more peripheral. These network properties, such as density, reliability, and centrality, together indicate the potential of one's network to confer business advantages.

2.3.1. Network density and performance

Network density is the degree to which an entrepreneur's contacts are connected to each other. In a highly dense network, the entrepreneur's friends, family, business peers, and other contacts form a close community with many mutual ties. One advantage of a dense network is that it facilitates frequent communication and strong trust among members (Peng et al., 2022). High density increases the exchange of information and resources within the network, because everyone is in contact and can readily share knowledge or help (Ding and Li, 2023). For a business owner, this means a dense network may provide reliable support, for instance, a tightly knit group of fellow entrepreneurs might rapidly disseminate news about market opportunities or collectively solve common problems. Empirical studies have generally found positive effects of network density on firm outcomes. In a study of SMEs, Ding et al. (2023) showed that greater network density was associated with higher overall performance, as dense networks enabled firms to obtain diverse information more easily and coordinate actions with partners. Dense networks can also reinforce an entrepreneur's credibility, since close connections often imply stronger social capital. For women entrepreneurs who often rely on community support, having a dense network of business contacts and mentors can translate into better client referrals, shared resources, and moral support, all contributing to improved performance. We acknowledge that extremely dense networks can sometimes become insular or redundant, but at moderate levels of density clearly enhance resource flow and innovation (Dong et al., 2023).

2.3.2. Network reachability and performance

Network reachability refers to how far and easily the entrepreneur can reach other actors in the wider business network beyond her immediate circle. Even if someone is not a direct contact, they might be "reachable" through a short chain of introductions or intermediaries. An entrepreneur with high reachability can leverage her network to connect with a broad range of people she has "reach" into different clusters or communities via a few degrees of separation. This concept is related to having a network that spans structural holes or bridges disparate groups. The benefit of high reachability is access to non-redundant, novel information and opportunities that lie outside one's immediate familiar circle (Hu et al., 2023). For example, a woman entrepreneur might not personally know a supplier in a new region, but through a mutual contact or two, she can quickly get an introduction; her network is reachable enough to connect her to that distant resource. According to social network theory, reachability enhances knowledge flow and learning because information can travel along short network paths with less delay or distortion. Khraim (2024) described reachability as a key positional attribute that increases the efficiency of resource exchange: an actor with many short paths to others can gather timely insights and referrals that would be inaccessible in a more isolated position. In the entrepreneurial context, high network reachability has been linked to greater innovation and adaptability. The entrepreneur is better informed about market trends and can tap into expert advice rapidly (Pattanasak et al., 2022). For women entrepreneurs who might lack direct access to elite business circles, having a network structure that still allows them to reach those circles through intermediaries can be extremely valuable. In short, the more reachability a woman's business network has, the more it can function as an extended resource pool for her venture.

2.3.3. Network centrality and performance

Network centrality signifies how centrally positioned and influential an entrepreneur is within her network. A highly central entrepreneur maintains numerous direct connections and often serves as a hub or bridge in the network structure (Rathore and Agrawal, 2021). Being central can confer prestige and early access to information that other in the network are likely to share knowledge with or seek advice from the central actor, keeping her well-informed. Centrality also means the entrepreneur can mobilize support or coordinate actions more effectively, since she is connected to many others. The literature consistently shows that network centrality is beneficial for firm performance. Firms or individuals with higher centrality tend to perform better, as they can more easily gather diverse information and garner resources from their network. For example, Yuan et al. (2022) found that an entrepreneur's centrality, measured by the number of direct ties and brokerage position positively influenced both innovation and sales growth in small enterprises. Central actors often act as information brokers by connecting otherwise unconnected groups; they can capitalize on opportunities, a concept related to structural hole theory. In the case of women entrepreneurs, increasing one's centrality, say, by actively networking across different professional groups, can lead to greater visibility for her business and quicker access to help when needed. A central position might help a woman business owner secure partnerships or informal mentorship from experienced peers, thereby enhancing her firm's performance.

Considering the above, a strong business network characterized by high density (cohesive ties), high reachability (extensive reach through short paths), and high centrality (prominent, well-connected position) should significantly improve a woman entrepreneur's chances of business success. Networks provide access to information, opportunities, and support systems that complement the entrepreneur's own skills (Ding and Li, 2024). Empirical research in various contexts has found that these network qualities can boost small firm growth and survival. We thus formulate the following hypotheses regarding business networking:

H4: Network density is positively associated with women entrepreneurs' business performance.
H5: Network reachability is positively associated with women entrepreneurs' business performance.
H6: Network centrality is positively associated with women entrepreneurs' business performance.

3. Materials and methods

This study employed a quantitative research design to examine the relationship between financial literacy, business networking, and women entrepreneurs' business performance in Malaysia. The research specifically targeted women micro-entrepreneurs who were participants of Amanah Ikhtiar Malaysia (AIM), one of the country's largest microfinance institutions serving low-income communities. AIM was selected as the context of this study due to its significant outreach and its focus on empowering women through microcredit and entrepreneurship support.

Data were collected using a structured questionnaire administered to 508 women entrepreneurs from different states in Malaysia. The survey instrument measured three main dimensions of financial literacy—financial management, saving literacy, and debt literacy—as well as three components of business networking: network density, reachability, and centrality.

The dependent variable, women's business performance, was evaluated using ten indicators that reflected financial outcomes, operational capacity, and business growth, including increases in profit, stock, equipment, customer satisfaction, and employment. All items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The sample included respondents from various age groups, educational backgrounds, and types of businesses, with most operating in the food and beverage, retail, and service sectors. The majority were Malay, married, and had over six years of business experience. Descriptive statistics were used to present the demographic profile, followed by Pearson correlation analysis to examine relationships among variables, and multiple regression analysis to test the six hypotheses. The regression model included all six independent variables to assess their collective and individual contributions to business performance.

Reliability of the measurement scales was verified using Cronbach's alpha, with all constructs exceeding the recommended threshold of 0.70, indicating good internal consistency. The analysis was conducted using SPSS version 26, and all assumptions for regression (normality, linearity, multicollinearity, and homoscedasticity) were checked and met. The findings provide empirical insight into how specific financial and social capital attributes influence the business performance of women entrepreneurs engaged in microenterprises within Malaysia's development context.

4. Results and discussion

4.1. Demographics

The demographic profile of the respondents reveals a diverse age distribution among women entrepreneurs engaged in microenterprises in Malaysia. Most respondents fall within the 41–50 years age group (31.1%), followed by those aged 30–40 years (26.8%) and 51–60 years (23.6%), indicating that middle-aged women dominate the entrepreneurial landscape in this context. A smaller proportion of respondents is below 30 years (7.9%) or above 61 years (10.4%), suggesting lower entrepreneurial engagement among the youngest and oldest age groups. This trend reflects a common pattern in microenterprise participation, where individuals in their peak working and family-supporting years are most active in business, possibly motivated by economic necessity and family responsibilities.

In terms of educational background, the majority of respondents have completed SPM (Sijil Pelajaran Malaysia), accounting for 51.4% of the sample. A notable portion holds secondary-level qualifications such as SRP/PMR (13.2%), while higher education attainment remains low, with only 5.7% holding a bachelor's degree and 0.6% a master's or Ph.D. A significant 6.5% have no formal education, further emphasizing the need for accessible entrepreneurial training and capacity-building programs tailored to lower-educated women. These findings suggest that most women micro-entrepreneurs operate with basic educational backgrounds, which may limit their access to formal employment and reinforce the importance of entrepreneurship as an alternative livelihood strategy.

Regarding marital status and ethnicity, an overwhelming 82.5% of the respondents are married, with 13.2% being single mothers, a group often associated with economic vulnerability and reliance on self-employment. The ethnic composition is predominantly Malay (95.5%), reflecting both the demographic profile of AIM's beneficiaries and broader national trends in microfinance outreach. Most businesses are relatively well established, with 38.2% operating for more than 11 years, and 26.2% between 6–10 years, indicating a mature entrepreneurial base. In terms of business sectors, food and beverages dominate (58.3%), followed by services (18.3%) and retail (14.8%). Agriculture-based enterprises account for 8.1%, showing limited but important rural engagement. The strong presence in food-related businesses may be due to lower capital requirements and the relevance of such ventures to household economies. Overall, the demographic profile underscores the need for targeted support that considers the maturity of businesses, limited formal education, and the social roles of women entrepreneurs.

4.2. Descriptive statistics

In descriptive analysis, Table 1 presents the descriptive statistics for all study variables based on 508 valid responses with no missing data. The mean scores indicate that, on average, respondents reported relatively high levels of financial literacy and business networking dimensions. Among the financial literacy variables, saving literacy (SL) had the highest mean (M = 4.200, SD = 0.525), followed by debt literacy (DL) with a mean of 4.072, and financial management (FM) at 3.907. In terms of business networking, network density (DY) recorded the highest mean (M = 4.225, SD = 0.509), followed by centrality (CY) at 4.164 and reachability (RY) at 4.029. The dependent variable, women's business performance (WBP), had a mean score of 3.924 (SD = 0.579), indicating a generally favorable perception of business performance among the participants. The standard deviations across variables suggest moderate variability, with reachability (RY) showing the highest dispersion (SD = 0.683). Overall, the results reflect a generally high level of financial and networking competencies among women entrepreneurs, along with positive business performance outcomes.

4.3. Pearson correlations

The correlation analysis reveals significant positive relationships among all study variables. Financial management (FM) is moderately correlated with women's business performance (WBP) ($r = 0.441$, $p < .001$), suggesting that better financial management practices are associated with improved business outcomes. Saving literacy (SL) also shows a moderate positive correlation with WBP ($r = 0.459$, $p < .001$), indicating its important role in enhancing business performance. Debt literacy (DL) has a weaker but still significant correlation with WBP ($r = 0.257$, $p < .001$), suggesting a comparatively lower influence. Among the networking dimensions, density (DY) and centrality (CY) both show moderate correlations with WBP ($r = 0.416$, $p < .001$), while reachability (RY) also correlates positively ($r = 0.372$, $p < .001$). Additionally, strong intercorrelations are observed among the independent variables, especially between networking dimensions, for instance, density and centrality ($r = 0.685$), and density and reachability ($r = 0.641$), highlighting the interconnected nature of social networking constructs. All correlations are statistically significant at the 0.001 level, supporting the theoretical links between financial literacy, business networking, and women's business performance (Table 2).

Table 1: Descriptive statistics

Variables	Valid	Missing	Mean	SD	Minimum	Maximum
FM	508	0	3.907	0.643	1.167	5.000
SL	508	0	4.200	0.525	2.750	5.000
DL	508	0	4.072	0.572	2.000	5.000
DY	508	0	4.225	0.509	2.429	5.000
RY	508	0	4.029	0.683	2.000	5.000
CY	508	0	4.164	0.581	2.000	5.000
WBP	508	0	3.924	0.579	1.636	5.000

FM: Financial management; SL: Saving literacy; DL: Debt literacy; DY: Density; RY: Reachability; CY: Centrality; WBP: Women business performance

Table 2: Pearson correlations

Variable		FM	SL	DL	DY	RY	CY	WBP
FM	Pearson's r	—						
	p-value	—						
SL	Pearson's r	0.529	—					
	p-value	< .001	—					
DL	Pearson's r	0.315	0.494	—				
	p-value	< .001	< .001	—				
DY	Pearson's r	0.327	0.49	0.578	—			
	p-value	< .001	< .001	< .001	—			
RY	Pearson's r	0.283	0.375	0.441	0.641	—		
	p-value	< .001	< .001	< .001	< .001	—		
CY	Pearson's r	0.317	0.428	0.428	0.685	0.671	—	
	p-value	< .001	< .001	< .001	< .001	< .001	—	
WBP	Pearson's r	0.441	0.459	0.257	0.416	0.372	0.416	—
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	—

FM: Financial management; SL: Saving literacy; DL: Debt literacy; DY: Density; RY: Reachability; CY: Centrality; WBP: Women business performance

4.4. Model summary

The model summary compares two regression models predicting women's business performance. Model M_0 is the null model (baseline) with no predictors, showing $R = 0.000$, $R^2 = 0.000$, and an RMSE (Root Mean Square Error) of 0.579, indicating that it explains none of the variance in the outcome. In contrast, Model M_1 includes the independent variables and shows a substantial improvement, with $R = 0.574$ and $R^2 = 0.329$, meaning that approximately 32.9% of the variance in women's business performance is explained by the model. The adjusted R^2 of 0.321 confirms that this explanatory power remains robust even after accounting for the number of predictors. Moreover, the RMSE decreases to 0.477, indicating improved predictive accuracy compared to the null model. Overall, Model M_1 provides a significantly better fit and predictive capability for understanding women's business performance (Table 3).

4.5. One-way ANOVA

The one-way ANOVA results indicate that the regression model (M_1), which includes six predictors, significantly explains the variance in women's business performance (Table 4). The regression sum of squares is 56.075 with 6 degrees of freedom, and the mean square for the model is 9.346. The F-value is 41.025 with a p-value less than .001, indicating that the model is statistically significant. This means that, collectively, the independent variables (financial literacy and business networking dimensions) provide a significantly better prediction of women's business performance compared to the null model. The residual sum of squares is 114.13 with 501 degrees of freedom, and the total variance in the model is 170.205. Overall, the ANOVA confirms that the regression model explains a significant portion of the variation in the dependent variable.

4.6. Regression

The regression analysis provides insights into how various dimensions of financial literacy and business networking influence women's business performance. Among the financial literacy variables, both financial management (H1) and saving literacy (H2) have significant and positive effects, with standardized beta values of 0.243 and 0.225, respectively ($p < .001$). This suggests that women entrepreneurs who manage their finances effectively and maintain strong saving habits tend to perform better in their businesses. However, debt literacy (H3) shows a significant but negative relationship with business performance ($\beta = -0.108$, $p = 0.022$), contrary to expectations. This may indicate that while understanding debt is important, a high focus on debt-related knowledge could reflect or lead to conservative borrowing behaviors or stress related to credit, which may hinder growth or risk-taking in business.

Table 3: Model summary

Model	R	R^2	Adjusted R^2	RMSE
M_0	0.000	0.000	0.000	0.579
M_1	0.574	0.329	0.321	0.477

M_1 includes FM, SL, DL, DY, RY, CY

Table 4: One-way ANOVA

Model		Sum of squares	df	Mean square	F	P
M_1	Regression	56.075	6	9.346	41.025	< .001
	Residual	114.13	501	0.228		
	Total	170.205	507			

M_1 includes FM, SL, DL, DY, RY, CY; The intercept model is omitted, as no meaningful information can be shown

In terms of business networking, both network density (H4) and centrality (H6) have significant positive effects on business performance ($\beta = 0.143$, $p = 0.015$ and $\beta = 0.133$, $p = 0.017$, respectively), supporting the notion that well-connected and centrally positioned entrepreneurs benefit more from information, referrals, and social capital. These findings affirm the importance of strong, cohesive networks and a prominent role within them. However, reachability (H5) does not significantly predict business performance ($p = 0.103$), indicating that simply being able to reach a wider range of contacts through intermediaries does not necessarily translate into tangible performance benefits. Overall, five out of the six hypotheses are statistically supported, highlighting the critical role of financial acumen and specific aspects of networking in enhancing women's entrepreneurial outcomes (Table 5).

Table 5: Coefficients

Model		Unstandardized coefficients	Standard error	Standardized coefficients	t	P
M_0	(Intercept)	3.924	0.026		152.635	< .001
M_1	(Intercept)	0.938	0.209		4.488	< .001
H1	FM	0.219	0.039	0.243	5.581	< .001
H2	SL	0.248	0.054	0.225	4.621	< .001
H3	DL	-0.109	0.048	-0.108	-2.291	0.022
H4	DY	0.163	0.067	0.143	2.438	0.015
H5	RY	0.073	0.045	0.086	1.631	0.103
H6	CY	0.133	0.056	0.133	2.392	0.017

FM: Financial management; SL: Saving literacy; DL: Debt literacy; DY: Density; RY: Reachability; CY: Centrality; WBP: Women business performance

4.7. Discussion of the findings

The regression results indicate that women entrepreneurs' financial literacy, encompassing financial management and saving, is a significant positive predictor of business performance. This finding aligns with Human Capital Theory, which posits that investments in knowledge and skills enhance productivity and outcomes. Women with stronger financial management skills likely budget more effectively, keep accurate records, and make informed financial decisions, leading to improved profitability and growth. Prior studies in emerging economies similarly report that higher overall financial literacy correlates with greater venture success (Andriamahery and Qamruzzaman, 2022). In fact, one study found that all dimensions of financial literacy, such as cash flow management, savings, and debt management, were positively and significantly related to women entrepreneurs' business success (Tuffour et al., 2022). Our results reinforce this pattern in the Malaysian context, suggesting that when women entrepreneurs possess better knowledge of bookkeeping, budgeting, and credit management, they can optimize cash usage, avoid costly debt traps, and capitalize on investment opportunities. The study found that the impact of debt literacy is significant but negative on women's business performance. This suggests that although women entrepreneurs may possess an understanding of borrowing mechanisms, repayment structures, and credit management, higher debt literacy might also make them more cautious or risk-averse when it comes to utilizing debt for business growth (Beban, 2025). Alternatively, it may reflect challenges in effectively leveraging debt for productive investments, possibly due to limited access to favorable credit terms or financial planning support (Ackah et al., 2024). These findings highlight the need for targeted financial education programs that not only enhance general financial skills but also improve the capacity of women entrepreneurs to manage and utilize debt effectively for sustainable business development.

These findings also echo recent empirical work linking financial literacy to performance among female micro-entrepreneurs. For example, a previous study showed that proxies of financial literacy, including financial education, cash forecasting, and bookkeeping, each had significant positive effects on female entrepreneurs' firm performance. Notably, that study found that financial education contributed the most to performance variance (Singla and Mallik, 2021), underscoring the value of training and education in finance. Consistent with this, our analysis suggests that among Malaysian women entrepreneurs, those well-versed in financial management practices achieve superior outcomes. According to Human Capital Theory, financial acumen constitutes a form of human capital that enhances managerial effectiveness. The ability to plan financially and manage savings/debt may also improve entrepreneurs' confidence and strategic thinking, fostering better decisions. In short, strong financial literacy provides women business owners with the "know-how" to allocate resources efficiently and respond to market changes, which ultimately improves performance.

At the same time, these results must be interpreted considering gender roles and constraints. Role Conflict Theory reminds us that many women entrepreneurs juggle business and household responsibilities, which can limit the time and focus available to apply their financial skills. Recent survey evidence in Malaysia shows that 73% of women micro-entrepreneurs struggle to balance business with childcare and domestic duties, and 38% report that family obligations directly keep them from focusing on their businesses. This "double burden" means that even highly knowledgeable women may find it challenging to fully implement sound financial management practices. Our findings of financial literacy's importance thus confirm their critical role, but also implicitly highlight that without addressing women's time poverty and role conflicts, the payoff from financial skills may not reach its full potential. This suggests an avenue for future interventions: supporting women in translating financial knowledge into practice by alleviating external constraints, such as providing childcare support during trainings or offering flexible scheduling for financial workshops.

The analysis also demonstrates that business networking characteristics measured by network density, reachability, and centrality have a significant influence on women entrepreneurs' performance. This underscores the applicability of Social Capital Theory in the Malaysian women entrepreneurship context. Social Capital Theory contends that networks of relationships constitute a valuable resource that can facilitate information flow, trust, and access to opportunities. Our findings support the fact that entrepreneurs who are more central in their business networks and can reach a wider range of contacts tend to perform better. Being centrally positioned likely means a woman entrepreneur is well-connected with key factors such as suppliers, customers, and mentors, which can lead to timely information about market trends or new business opportunities. Prior research has similarly found that network centrality and size are positively associated with firm performance (Anshika and Singla, 2022). In our study, women with greater network reachability, the ability to access distant or diverse contacts, presumably benefit from exposure to new ideas and markets, reflecting the value of bridging social capital in fostering innovation and growth.

Network density, which reflects how interconnected an entrepreneur's contacts are, was also positively correlated with performance. A tightly knit network can provide strong support and reliable information through frequent interactions among trusted peers. This bonding social capital might help women entrepreneurs secure moral support, quick help in crises, or referrals within a close community. The positive role of density aligns with the idea that cohesive networks build trust and norms that facilitate cooperation. However, extremely dense networks can sometimes limit the influx of novel information. In our context, the significant benefits of density imply that, for women entrepreneurs operating often in community-based settings, the trust and mutual help from close networks contribute meaningfully to business stability and incremental growth. This complements the effect of reachability: a balance of close-knit support and expansive reach appears to be most beneficial.

Our results corroborate findings from other contexts that social networks substantially enhance women's entrepreneurial success. Olamide and Ogbechie (2021) reported that multiple dimensions of social capital improved female-owned SMEs' capacity to exchange information and resources, which in turn boosted performance. Similarly, a study of women entrepreneurs found a strong positive relationship between social capital and business performance, estimating that a 100% increase in social capital corresponded to a 31.5% increase in performance. This substantial impact illustrates that enterprise success is not governed by financial and human capital alone; rather, the valuable market and operational knowledge gained through networks can directly translate into improved sales and profitability. Our research extends such insights by unpacking specific network metrics such as centrality, reachability, and density in the Malaysian setting. It highlights that not just the size of a network, but how it is structured and how far it spans, matters for women entrepreneurs' outcomes. In line with Social Capital Theory, the findings confirm that women entrepreneurs' social ties function as a form of capital that provides information channels, peer learning, and even role models, thereby enhancing their businesses' performance.

It is worth noting that women in Malaysia may face cultural and practical barriers to broadening their business networks. Many rely on family and close friends but have limited access to wider professional networks, often due to societal norms or lack of time for networking events. Role Conflict Theory offers insight here: women's familial roles can constrain their networking activities, as evidenced by reports that time limitations "limit networking opportunities" for most women entrepreneurs. Therefore, while our data show networking pays off, not all women can equally invest in networking. This may explain why some entrepreneurs with lower network metrics lag in performance despite Malaysia having numerous entrepreneur associations. The issue is often accessibility and awareness. These nuances suggest that facilitating network development for women could unlock significant performance gains.

5. Conclusions

The findings carry important practical implications for improving women entrepreneurs' outcomes in Malaysia. First, the clear link between financial literacy and business success indicates a need to strengthen financial education for current and aspiring women entrepreneurs. Microfinance initiatives such as Amanah Ikhtiar Malaysia (AIM), which serves as the country's largest microfinance provider to low-income women, should complement microcredit with robust financial literacy training. AIM provides small loans to over 80% of poor households without collateral, and integrating financial management workshops into their lending programs could significantly enhance the effectiveness of those loans. Prior research has advocated for continuous training of female micro-entrepreneurs in bookkeeping, budgeting, and understanding market volatilities. Implementing such capacity-building within AIM or similar schemes would equip women to utilize loans more productively, manage cash flows, and avoid over-indebtedness. Additionally, fear of debt and lack of loan management skills are known challenges for many Malaysian women entrepreneurs. Thus, practical modules on debt literacy, such as calculating interest and planning repayments, could improve not only business performance but also the financial well-being and confidence of women borrowers.

Second, our results on networking suggest that facilitating business networks for women is vital. Entrepreneurs benefit greatly from peer support groups, business associations, and informal networks that provide market information and mentorship. However, many women, especially in rural or small-town settings, are unaware of or unable to access such networks. Government agencies and NGOs should raise awareness about existing women entrepreneur associations and help establish local networking forums. For instance, the government could partner with organizations like the Women Entrepreneur Network Association (WENA) or chambers of commerce to host regular meetups or online networking sessions for women business owners in various regions. As one study recommended, financial institutions and policymakers should create avenues through which women can interact and learn diverse business practices, leveraging the power of social capital for business growth. This could involve networking workshops attached to microfinance group meetings, business mentorship programs linking experienced women entrepreneurs with newcomers, or online platforms where women can share experiences and resources. By fostering both bonding networks, such as supportive local groups, and bridging networks, including connecting women to broader industry contacts, such initiatives can enhance the density and reachability of women's networks, translating to better performance.

Third, national SME development policies should incorporate a gender-sensitive approach that addresses the unique challenges women entrepreneurs face. Given the prevalence of role conflict and time poverty, training and networking events must be designed to be accessible, offering childcare services during events, flexible scheduling, or virtual training options. Malaysia's SME and entrepreneurship programs under agencies like SME Corp, MARA, or TEKUN could tailor schemes for women that bundle financial literacy courses, coaching, and networking support. This is in line with calls for government intervention to provide targeted funds and training for women's skill advancement and to accelerate their economic empowerment. Notably, Malaysia's National Entrepreneurship Policy emphasizes inclusivity; operationalizing this could mean allocating grants for women-centric entrepreneurship workshops and improving outreach to ensure women in underserved areas join these programs. Additionally, microfinance providers like AIM can collaborate with telecom and tech companies to introduce digital tools for networking and learning, thus overcoming geographic barriers. The practical implication is that boosting women entrepreneurs' performance is not solely about providing credit or basic business training but creating an ecosystem where financial capability and social networks are deliberately cultivated. In summary, stakeholders from microfinance institutions to government bodies should invest in "financial capital plus human capital plus social capital" approaches: credit and grants combined with financial literacy education and networking opportunities. Such a holistic strategy will better enable Malaysia's women entrepreneurs to thrive, contributing more robustly to household incomes and national SME growth.

This study makes several contributions to the academic understanding of women's entrepreneurship, particularly by integrating perspectives of human capital, social capital, and gender role conflict. First, our findings reinforce the tenets of Human Capital Theory in an entrepreneurship context. By showing that specific financial knowledge and skills significantly improve business performance, we provide empirical support that extends prior research on education and entrepreneurial success into the realm of financial literacy. While Human Capital Theory has long posited that education increases productivity, our work zeroes in on financial education as a critical subset for entrepreneurs. We thereby add nuance to the theory: not all knowledge is equal for women entrepreneurs; practical financial management know-how is especially valuable for venture success. This confirmation is in line with recent literature positioning financial literacy as a strategic capability for small firms. It also contributes a developing-country perspective, including Malaysia, to a literature often dominated by studies from advanced economies, thus broadening the theory's applicability.

Second, the study contributes to Social Capital Theory by detailing how structural aspects of networks, such as density, reachability, and centrality, relate to performance. Much of the social capital literature in entrepreneurship highlights the importance of network size or the presence of mentors. Our results deepen this by empirically demonstrating that how a network is structured also matters for women's success. This finding can extend social capital theory by incorporating network quality and position as key factors; for instance, being centrally embedded in a business network can be theorized as conferring influence and information advantages that drive performance. We also highlight the dual benefits of bonding and bridging social capital: dense networks offer trust and support, while far-reaching networks bring new knowledge. Thus, we provide a more granular confirmation of social capital's value, aligning with and extending prior findings that social networks strongly predict women entrepreneurs' performance. Our study suggests that theories of entrepreneurial social capital should consider network structure metrics as important variables, especially when examining women entrepreneurs who might build networks differently than their male counterparts.

Third, by discussing the role of Role Conflict Theory in our context, we introduce a theoretical lens that is often outside traditional performance models. We highlight that women's human and social capital must be viewed considering gender roles: the effectiveness of financial literacy or networking may be moderated by the degree of role conflict a woman experiences. This is a theoretical extension suggesting that models of women's entrepreneurial performance could incorporate role conflict or family responsibility variables as moderators. In doing so, we connect the literature on women's multiple roles with the entrepreneurship success literature. The clear evidence of time poverty among women entrepreneurs implies that future theoretical frameworks should not treat resources like financial and social capital as uniformly accessible or usable by men and women alike; rather, they should account for the gendered context. Our work, therefore, contributes to theory by bridging concepts from social or family psychology into entrepreneurial success models, paving the way for more holistic theories of female entrepreneurship.

While the study provides valuable insights, there are several limitations that open avenues for future research. First, the scope of our sample was confined to women micro-entrepreneurs in Malaysia, many of whom were involved in microfinance programs. This limits generalizability to all women-owned businesses in the country. Women running medium or large enterprises, or those outside microfinance schemes, may face different challenges and resource dynamics. Future studies could include a broader range of business sizes and sectors, for instance, comparing micro-entrepreneurs with women running larger SMEs to see if financial literacy and networking play similar roles across contexts. Additionally, our sample was cross-sectional, capturing a single time point of performance. It was due to the limited time and resources to collect the data. Longitudinal research would be useful to track how improvements in financial literacy or network expansion translate into performance gains over time, and whether there are diminishing returns or threshold effects.

Second, the study focused on a specific set of variables (financial management, saving, and debt literacy; network density, reachability, and centrality) and their direct effects on performance. There are other factors we did not include that could be important. Hence, personal attributes like entrepreneurial self-efficacy or risk tolerance might interact with debt literacy as an area ripe for exploration. Future research could also examine interaction effects: does having a strong network compensate for lower debt literacy, or vice versa? Moderation analysis could reveal if social capital strengthens the impact of financial skills on performance. Future studies are recommended to test the mediation or moderation analysis of variables such as fear or debt to investigate this relationship for better scientific understanding. Likewise, the influence of digital literacy and ICT usage has emerged as crucial in recent years; studies could incorporate digital financial literacy as an additional dimension, given the rise of online business and fintech solutions for entrepreneurs.

Third, our discussion raised the relevance of role conflict and other socio-cultural factors, but our empirical model did not explicitly measure them. This is a limitation because it means we inferred their influence rather than tested it. To build on this, future studies should consider including measures of work-family conflict, family support, or cultural norms in the model. For example, a future survey might include items on time spent on household duties, spousal support, or childcare availability, and test whether these moderate the relationship between independent variables such as financial literacy and networking, and business performance. Such work would directly validate the propositions drawn from Role Conflict Theory and provide deeper insights into how context shapes women entrepreneurs' use of financial and social capital.

In addition, there are measurements and data considerations. Our performance metric relied on self-reported business outcomes, which can introduce respondent bias. Future research could attempt to obtain more objective performance data, such as actual sales, profit records, or business survival rates, to corroborate the self-reports. We also acknowledge that network characteristics were self-reported, such as entrepreneurs estimating their network reachability, which may not capture the full complexity of their social networks. Social network analysis using detailed network mapping or third-party verification of connections could strengthen validity. Despite these limitations, our study sets a foundation for understanding how Malaysian women entrepreneurs leverage financial literacy and networks. Going forward, researchers should build on this foundation by exploring broader samples, additional variables like technology use or formal training received, and the intricate ways in which gender roles intersect with entrepreneurial resources. Such research will not only address the gaps in our study but also inform more tailored interventions to empower women entrepreneurs in Malaysia and beyond.

Finally, while the study provides valuable empirical insight into how financial and social capital attributes influence women entrepreneurs' performance in Malaysia's microenterprise sector, it is important to acknowledge certain limitations. The reliance on self-reported data may introduce social desirability and recall biases, potentially affecting the accuracy of responses, particularly on sensitive financial matters or subjective assessments of business performance. Although the questionnaire was carefully designed and pretested to minimize such biases, future research could incorporate objective performance metrics or triangulate findings using financial records or qualitative interviews to enhance robustness.

List of abbreviations

AIM	Amanah Ikhtiar Malaysia
ANOVA	Analysis of variance
CY	Centrality
DL	Debt literacy
DOSM	Department of Statistics Malaysia
DY	Density
FM	Financial management
ICT	Information and communication technology
MARA	Majlis Amanah Rakyat
MSMEs	Micro, small, and medium enterprises
PMR	Penilaian Menengah Rendah
RM	Malaysian ringgit
RY	Reachability
SD	Standard deviation
SL	Saving literacy
SMEs	Small and medium enterprises
SPM	Sijil Pelajaran Malaysia
SPSS	Statistical Package for the Social Sciences
SRP	Sijil Rendah Pelajaran
TEKUN	Tabung Ekonomi Kumpulan Usaha Niaga
UUM	Universiti Utara Malaysia
WBP	Women business performance
WENA	Women Entrepreneur Network Association

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Compliance with ethical standards

Ethical considerations

The data for this research were collected from the borrowers of Amanah Ikhtiar Malaysia (AIM) with the official permission granted with Letter No. AIM/UPI/800-04/01. All procedures performed in this study involving human participants were in accordance with the 1964 Declaration of Helsinki and its later amendments. The participants of this study were informed prior to data collection by showing the official letter granted by AIM.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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