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RURAL WOMEN-LED MICROENTERPRISES IN UZBEKISTAN: THE ROLE OF FINANCIAL LITERACY — AN EMPIRICAL ANALYSIS

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Abstract: The current study aims to explore the effects of financial literacy on the performance of enterprises owned by 173 female micro-entrepreneurs in Khorezm, Uzbekistan. The OLS regression analysis is employed to test the hypothesis of financial literacy affecting the performance of female-owned businesses in Khorezm. In particular, the study focuses on three components of financial literacy including financial education, cash forecasting, and bookkeeping practices. The results reveal that all three components significantly and positively affect business performance, with cash forecasting having the highest impact ($\beta = 0.513$, $p < 0.001$) followed by bookkeeping practices ($\beta = 0.495$, $p < 0.001$) and financial education ($\beta = 0.281$, $p < 0.01$). Financial literacy accounts for 62.3% of the variance in business performance ($R^2 = 0.623$). Entrepreneurial experience and education positively affect business performance, whereas age has a significantly negative effect.

Keywords: financial literacy, female micro-entrepreneurs, business performance, cash forecasting, bookkeeping practices, financial education, human capital, entrepreneurship, Uzbekistan, OLS regression.

Аннотация: Цель настоящего исследования заключается в изучении влияния финансовой грамотности на результаты деятельности предприятий, принадлежащих 173 женщинам-микропредпринимателям в Хорезмской области Узбекистана. Для проверки гипотезы о влиянии финансовой грамотности на результаты деятельности предприятий, принадлежащих женщинам в Хорезмской области, использован регрессионный анализ методом наименьших квадратов (OLS). В частности, исследование охватывает три компонента финансовой грамотности: финансовое образование, прогнозирование денежных потоков и ведение бухгалтерского учёта. Результаты показывают, что все три компонента оказывают статистически значимое и положительное влияние на результаты деятельности предприятий, при этом наибольшее влияние оказывает прогнозирование денежных потоков ($\beta = 0,513$, $p < 0,001$), за ним следуют практика ведения бухгалтерского учёта ($\beta = 0,495$, $p < 0,001$) и финансовое образование ($\beta = 0,281$, $p < 0,01$). Финансовая грамотность объясняет 62,3% вариации результатов деятельности предприятий ($R^2 = 0,623$). Предпринимательский опыт и образование оказывают положительное влияние на результаты деятельности предприятий, тогда как возраст оказывает статистически значимое отрицательное влияние.

Ключевые слова: финансовая грамотность, женщины-микропредприниматели, результаты деятельности предприятий, прогнозирование денежных потоков, ведение бухгалтерского учёта, финансовое образование, человеческий капитал, предпринимательство, Узбекистан, регрессионный анализ OLS.

INTRODUCTION

Empowering, motivating, and influencing employees is the ability of leadership, and it highly improves the organization's effectiveness and success. In past decades, elderly people supported gender-based discrimination because they believed that women were less qualified than men for leadership positions (Yukl, 2019). However, in modern globalizing life, men and women are equally accustomed to occupying leadership positions based on anti-discrimination levels. Recent research claims that women are more likely than men to maintain the values and skills required for successful leadership in contemporary companies. "These encourage" feminine 'values such as kindness, compassion, nurturing, and sharing". Notwithstanding, from the past views, leaders should hold the skills such as confident, task-oriented, competitive, objective, decisive, and assertive, which are more suitable for masculine attributes (Yukl, 2019).

Building on these viewpoints, it's critical to consider how women participate in entrepreneurship, especially when it comes to microbusinesses. Numerous obstacles frequently confront female micro-entrepreneurs, including restricted financial means, cultural norms, and less opportunities for professional development. At the same time, they are making a bigger and bigger contribution to community development and local economies.

Accordingly, one of the most important factors influencing company performance is financial literacy. The viability and expansion of women-led firms may be determined by their capacity to comprehend and effectively manage finances, even though leadership qualities like motivation, confidence, and decision-making are essential. The question of whether financial literacy is a necessary skill for female leaders in microbusinesses or if nurturing and interpersonal skills are enough to propel organizational success is still up for dispute among academics.

Thus, the purpose of this study is to examine how financial literacy and business performance relate to one another among female micro-entrepreneurs, with an emphasis on leadership positions. In this context, financial literacy emerges as a critical determinant of business success. The ability to understand, manage, and apply financial knowledge effectively can significantly influence the sustainability and growth of women-led enterprises. While leadership qualities such as motivation, confidence, and decision-making remain essential, there is ongoing academic debate regarding whether financial literacy is a necessary complementary skill for female entrepreneurs or whether interpersonal and relational leadership skills alone are sufficient to ensure organizational success. Therefore, this study aims to examine the relationship between financial literacy and business performance among female micro-entrepreneurs, with a specific focus on their leadership roles. The study seeks to determine how financial knowledge contributes to business outcomes and whether it strengthens the effectiveness of women's leadership in microenterprise settings.

REVIEW OF LITERATURE ON THE SUBJECT

In modern society, financial literacy is becoming an increasingly important factor for success, especially for micro-entrepreneurs from low-income countries(Ndaghu et al., 2022). Financial literacy means being able to understand and utilize financial information to make informed financial decisions. For entrepreneurs, this skill can significantly impact how they manage their businesses and the overall success of their companies. The lack of education, accessible credit, and adequate support systems among female entrepreneurs makes financial literacy essential for achieving better business outcomes(Culebro-Martínez et al., 2024). Financial literacy is crucial because it enables individuals to understand how to manage their finances effectively. It teaches entrepreneurs key ideas like interest rates, risks, returns, inflation, and how to spread out investments. When people understand these concepts, they can make better financial decisions. This knowledge helps both individuals and businesses handle money more effectively (Ndaghu et al., 2022).

Many academic works analyze the relationship between business literacy and business performance worldwide. One recent study by Ndaghu et al. (2022) explores this relationship in Nigeria, with a focus on female micro-entrepreneurs. Ndaghu et al. (2022) conducted a study examining the link between various components of financial literacy and business performance among female micro-entrepreneurs in North-Eastern Nigeria. Using data from 247 female entrepreneurs selected from six Nigerian states, the researchers employed structural equation modeling (SEM) via SmartPLS 3.2.7 to analyze the relationships. They found that cash forecasting, bookkeeping, and business performance significantly correlate with business success when the owner is a woman.

Moreover, Alshebami and Al Marri (2022) examined the effect of financial literacy on people's interest in starting a business. They used data from 623 people aged 18 to 55, living in rural areas of seven cities in Saudi Arabia. The research was based on two theories: the Theory of Planned Behavior and Social Cognitive Theory. They tested two ideas: (1) people with more financial knowledge are more likely to want to start a business, and (2) saving habits help explain this link. The results supported both ideas(Alshebami and Marri, 2022).

Kalekye and Memba (2015) investigated how basic financial skills can enhance the success of women-owned businesses. Their research showed that skills like budgeting, saving, bookkeeping, and managing cash flow have a big impact on business profits. They collected data from 76 businesses using a questionnaire and analyzed the results with statistical tools. The study also uses Dual Process Theory, which explains how people make decisions — sometimes quickly with intuition, and sometimes slowly with careful thinking.

Guo et al. (2024) investigated the impact of financial literacy on entrepreneurial engagement among rural households in Guangdong, China. They looked at responses from over 600 people between the ages of 18 and 55, applying theories about behavior and decision-making. Their analysis showed a clear pattern: the more people understood both basic and advanced financial topics, the more likely they were to engage in entrepreneurship. To make sure their results were solid, the team used several statistical tools, including Probit and OLS models. Still, the study wasn't without limits—it focused on just one region, relied on self-reported

data, and didn't fully consider local institutions, which might also shape business decisions (Guo et al., 2024).

This study looks into how financial education might influence how well a business performs. It also explores whether practices like cash forecasting and bookkeeping have a meaningful impact on business success.

To guide this investigation, the study puts forward the following hypotheses:

H1: There is a positive relationship between financial education and business performance.

H2: There is a positive relationship between cash forecasting and business performance.

H3: There is a positive relationship between bookkeeping and business performance (Figure 1).

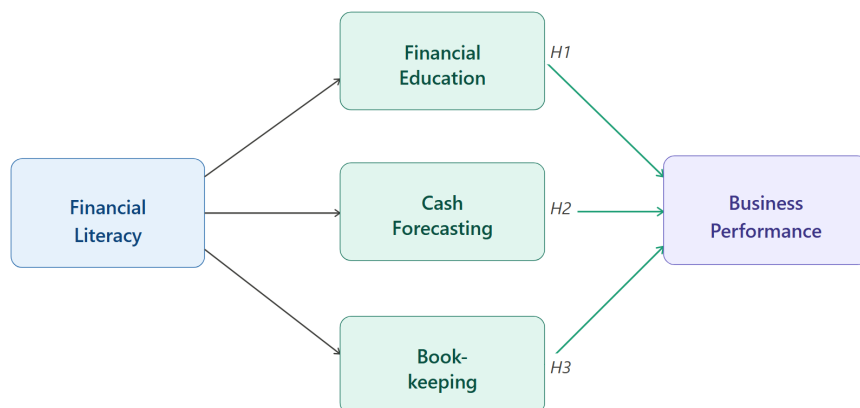


Figure 1. Conceptual Framework of the Study¹

Financial education has been identified as an essential element that contributes greatly to entrepreneurship success. According to Tumba et al. (2022), financial education plays a vital role in determining the performance of businesses owned by women in Nigeria because those entrepreneurs who go through financial education are able to effectively utilize their financial resources and avoid risks, thereby achieving sustainable growth. In addition, Wahyulina et al. (2023) found that education and financial literacy significantly influence the development of small enterprises within creative industries. Building on these findings, this study proposes:

H1: There is a positive relationship between financial education and business performance.

Through cash forecasting, entrepreneurs will be able to predict the future demands on their resources and avoid any money shortages. According to Tumba et al. (2022), cash forecasting is one of the main aspects of financial literacy that directly influences the manner in which entrepreneurs operate and expand their ventures. This view is reinforced by the Association of Chartered Certified Accountants (2023), which observed that SMEs practicing cash forecasting in their financial operations possess more resilience to income fluctuations and expenses. Consequently, we propose the following hypothesis:

H2: There is a positive relationship between cash forecasting and business performance.

Bookkeeping gives entrepreneurs access to financial information required for decision-making. According to Tumba et al. (2022), bookkeeping is an essential element of financial literacy that is positively related to SMEs' business performance because entrepreneurs who keep track of their financial activities are better placed to monitor their cash flow and determine their profitability. The assertion is further substantiated by Amatucci et al. (2011), who asserted that financial recording and tracking capabilities are among the most important competencies possessed by successful entrepreneurs. Based on this, the current research hypothesizes:

H3: There is a positive relationship between bookkeeping and business performance.

RESEARCH METHODOLOGY

The target population of this study consisted of micro-level women entrepreneurs residing in Shavat city and its surrounding villages in the Khorezm region of Uzbekistan. The sample was drawn from women entrepreneurs operating at the household and community levels, reflecting the realities of small-scale business activities in the area. The survey was conducted in July 2025 with the participation of 173 respondents, and the study received ethical approval from the Research Ethics Committee of Westminster International University in Tashkent (WIUT). A random sampling approach was employed: first, lists of women entrepreneurs were obtained from local community (mahalla) records, after which data were collected by visiting their homes individually by Shavat Khokimiyat workers. The survey instrument was administered in paper format, with

¹ Source: Author's own work.

respondents marking their answers directly on the provided questionnaire sheets. This approach allowed for greater inclusiveness, particularly for participants with limited digital access (Table 1).

Table 1. Descriptive Statistics²

Variable	Frequency(n)	Percentage(%)
Age		
18-35 Years	41	23.70%
36-52 Years	107	61.85%
53 Years – Above	25	14.45%
Total	173	100%
Marital Status		
Single	30	17.34%
Married	143	82.66%
Total	173	100%
Education		
School/College	125	72.25%
HND/B.Sc	44	25.43%
Masters and above	4	2.31%
Total	173	100%
Work experience		
0-5 Years	61	35.26%
6-10 Years	45	26.01%
11 Years and Above	67	38.73%
Total	173	100%

Only women make up our sample; 83% of them are married, and 17% are single. According to the Figure 3 (61.85%), middle-aged women predominate in the sample, with the average respondent being between the ages of 36 and 52. The majority of responders (72.25%) hold school or college diplomas. This implies that the majority of the sample consists of people with lower to mid-level education, with very few having higher degrees. Responses about technical skills or knowledge may be impacted by this. The majority of respondents (38.73%) have worked for at least 11 years, suggesting that many of them are seasoned professionals. The largest percentage (26.01%) are in the mid-career stage of 6–10 years, while a sizable portion (35.26%) are still in the early stages of their careers with 0–5 years of experience (Figure 2; 3; 4; 5).

² Source: Author's own work.

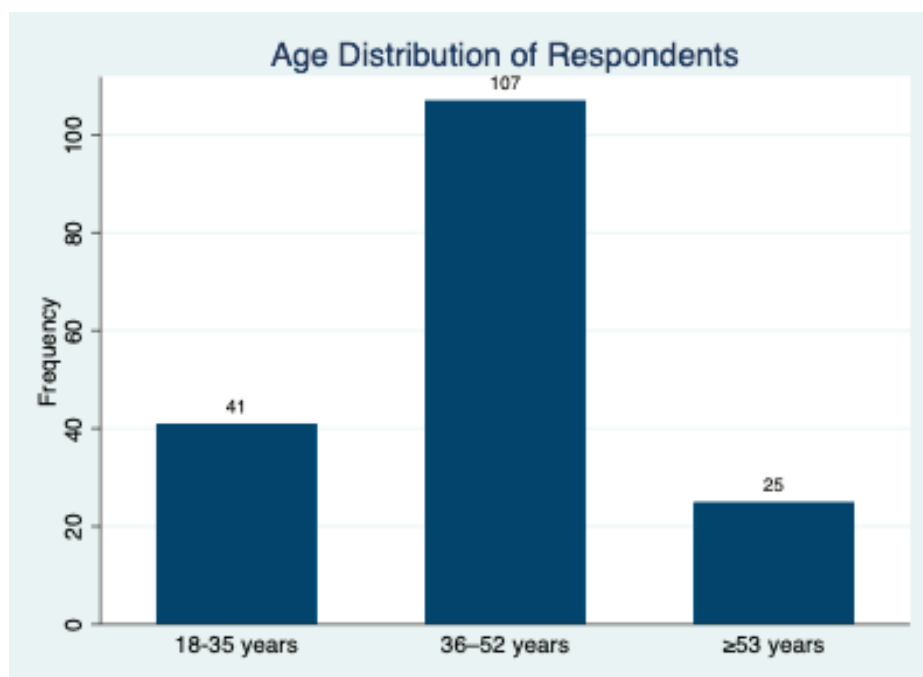


Figure 2. Age Distribution of Respondents³

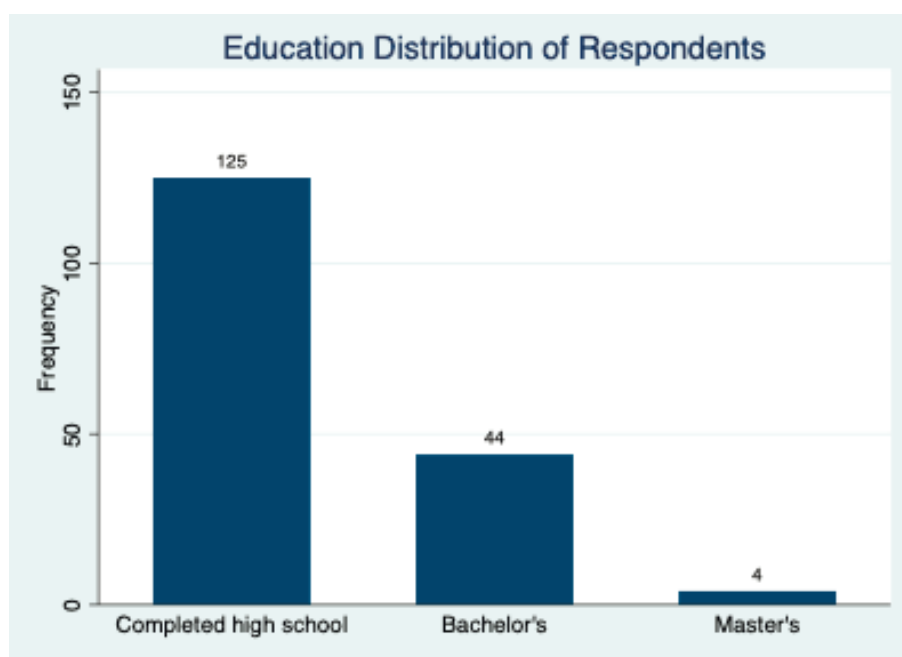
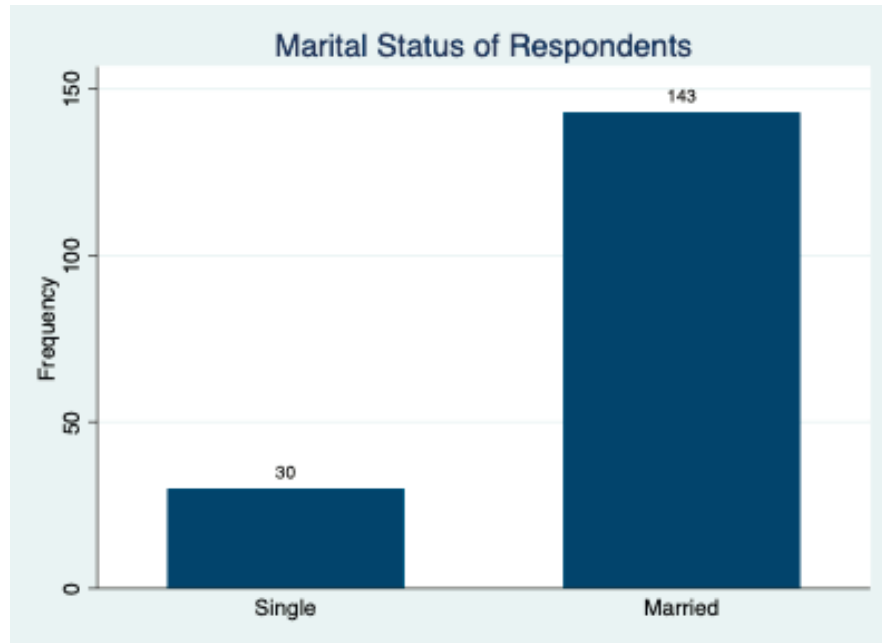
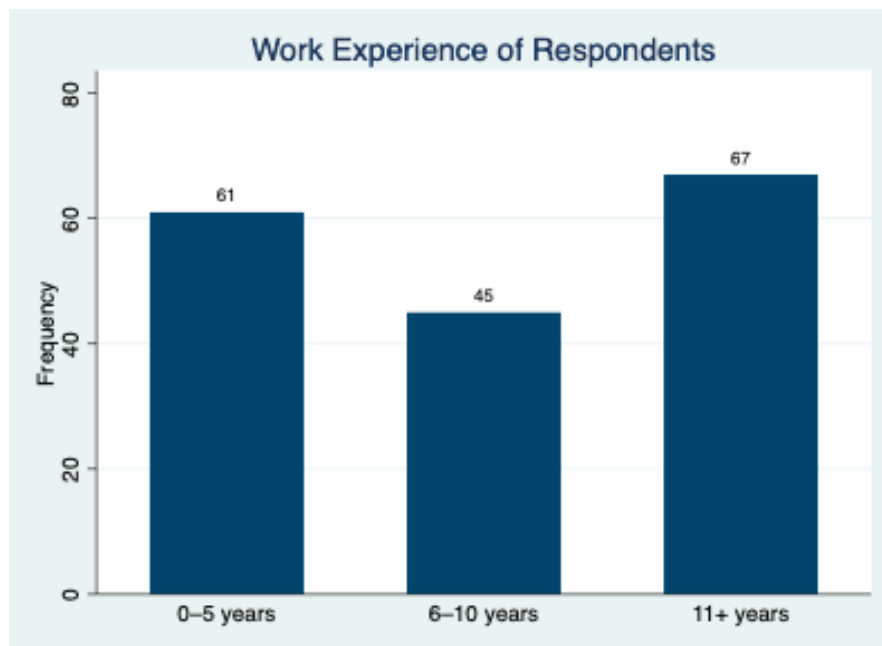


Figure 3. Education Distribution of Respondents⁴

³ Source: Author's own work.

⁴ Source: Author's own work.

Figure 4. Marital Status of Respondents⁵Figure 5. Work Experience of Respondents⁶

The study employs the following multiple regression model to examine the effects of financial literacy dimensions on business performance:

$$\text{Business Performance} = \beta_0 + \beta_1 \text{Financial Education} + \beta_2 \text{Cash Forecasting} + \beta_3 \text{Bookkeeping Practice} + \beta_4 \text{Age} + \beta_5 \text{Experience} + \beta_6 \text{Education} + \beta_7 \text{Married} + \beta_8 \text{Position} +$$

where:

Business Performance is the dependent variable representing the overall performance of the business.

• **X₁ = Financial Education**, which refers to the entrepreneur's knowledge and understanding of fundamental financial concepts, including interest rates, inflation, financial products, and financial decision-making.

⁵ Source: Author's own work.

⁶ Source: Author's own work.

- **X₂ = Cash Forecasting**, which reflects the entrepreneur's ability to estimate, monitor, and plan future cash inflows and outflows to ensure sufficient liquidity for business operations.
- **X₃ = Bookkeeping Practice**, which measures the extent to which entrepreneurs maintain accurate financial records, track transactions, and prepare financial information for business management purposes.
- **X₄ = Age**, representing the age category of the respondent.
- **X₅ = Business Experience**, indicating the number of years the entrepreneur has been involved in business activities.
- **X₆ = Education Level**, referring to the highest educational qualification attained by the respondent.
- **X₇ = Marital Status**, representing whether the respondent is married or unmarried.
- **X₈ = Position**, indicating the respondent's role within the business, such as owner, manager, or both owner and manager.

The questionnaire used in this study to measure financial literacy was designed in accordance with Amatucci et al. (2011) and Tumba et al. (2022). Each of the survey's four primary sections (A–D) was created to evaluate a particular construct that was pertinent to the investigation. A 5-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," was used to rate each item unless otherwise noted. Respondents' personal information is described in Section A. Age, marital status, educational background, organizational position, and work experience were among the demographic and background data gathered in this section. In the analysis, these variables were regarded as control variables. The study's independent variable (X), represented in Section B, is financial literacy, which was evaluated in three dimensions: Firstly, Financial Education is measured with 4 items (e.g., knowledge of the time value of money, awareness of interest and inflation rates, and familiarity with financial markets).

Secondly, Cash Forecasting is illustrated with 4 items (e.g., estimating cash flow, understanding cash needs, and consulting experts for financial decisions).

And thirdly, Bookkeeping Practice comprises 5 items (e.g., keeping financial records, evaluating investment alternatives, and understanding balance sheets and profit and loss statements).

Section C focuses on Organizational Performance (the dependent variable, Y in this study), which was measured using multiple performance indicators. It was assessed with 6 items, focusing on financial and operational outcomes such as cost reduction, business value, revenue growth, profitability compared to competitors, return per employee, and asset growth.

This methodology, grounded in well-established international standards, ensures both the reliability and the contextual relevance of our financial literacy assessment for female micro-entrepreneurs in the Khorezm region, Uzbekistan.

ANALYSIS AND RESULTS

The OLS regression model is significant ($F = 71.65$, $p < 0.001$) and has an R^2 value of 0.623, meaning that about 62.3% of the variance in business performance of the 173 female entrepreneurs sampled in Khorezm is accounted for by the model. This degree of explanatory power is quite high for cross-sectional survey data (Table 2).

Table 2 . OLS Regression Results: Determinants of Business Performance⁷

VARIABLES	Business Performance
Financial Education	0.281*** (0.0954)
Cash Forecasting	0.513*** (0.144)
Bookkeeping Practice	0.495*** (0.108)
Age	1.297** (0.556)
Education	0.967* (0.532)
Experience	0.867**

⁷ Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Source: Author's own computation using Stata 16.

	(0.433)
Married	0.409
	(0.637)
Position	-0.290
	(0.307)
Constant	-3.440*
	(2.003)
Observations	173
R-squared	0.639

Financial Education and Business Performance (H1)

There is a positive and significant relationship between financial education and business performance ($\beta = 0.281$, $p < 0.01$), thereby supporting H1. Entrepreneurs with greater financial education tend to make better decisions and manage their resources more effectively, resulting in improved business performance. This is supported by the study by Tumba et al. (2022), which found that financial education accounted for the greatest variance in business performance among female micro-entrepreneurs and concluded that it is critical for entrepreneurial success. In the case of Uzbekistan, where there is unequal access to financial education, the number of women entrepreneurs increased considerably to reach 2.1 million women entrepreneurs in 2024, despite facing barriers such as a lack of access to finance and financial education.

Cash Forecasting and Business Performance (H2)

The cash forecast turns out to be the best predictor of the performance of a business ($\beta = 0.513$, $p < 0.001$), thereby providing solid evidence for Hypothesis 2. Those entrepreneurs who systematically plan and forecast their future cash flow can better cope with the financial risks and maintain their business operations. Similar to the findings of Tumba et al. (2022), who discovered the effect of cash forecasting on the performance of female entrepreneurs, the present study calls for regular training and workshops on financial management techniques such as cash forecasting and market volatility. The magnitude of the coefficient may be attributed to the fragile financial situation of the micro-entrepreneurs in Khorezm due to their unpredictable income sources.

The results show that all three financial literacy components—financial education, cash forecasting, and bookkeeping practices—have positive and statistically significant effects on business performance.

Bookkeeping Practice and Business Performance (H3)

Bookkeeping practices have a strong and significant positive impact on business performance ($\beta = 0.495$, $p < 0.001$). Hence, H3 is supported by the results of the current study. The importance of accurate bookkeeping practices lies in the possibility to track cash flow and calculate the level of profitability, which, in turn, will help the entrepreneur make better decisions. These results corroborate the findings of Tumba et al. (2022), who found that bookkeeping enables tracking financial operations systematically and becomes an important part of financial literacy that promotes entrepreneurship success. The similarity in magnitude between the bookkeeping and cash forecasting coefficients indicates their complementary nature.

Among the control variables, age ($\beta = 1.297$, $p < 0.05$) and experience ($\beta = 0.867$, $p < 0.05$) have positive and statistically significant effects on business performance, while education ($\beta = 0.967$, $p < 0.10$) shows a positive, marginally significant effect. These findings are broadly consistent with human capital theory, which posits that accumulated knowledge, skills, and experience enhance managerial competence and productivity (Becker, 1964). The positive effect of age suggests that older female entrepreneurs in Khorezm may draw on greater accumulated business experience, established customer and supplier networks, and practical market knowledge, all of which contribute to stronger business outcomes. Marital status ($\beta = 0.409$, $p > 0.10$) and position ($\beta = -0.290$, $p > 0.10$) were not found to be statistically significant predictors of business performance (Table 3).

Table 3. Variance Inflation Factor (VIF) Test for Multicollinearity⁸

	VIF	1/VIF
Bookkeeping practices	2.511	.398
Cash Forecasting	2.222	.45
Financial Education	1.727	.579
Age	1.451	.689
Experience	1.332	.751
Married	1.098	.911
Education	1.069	.936
Mean VIF	1.63	.

CONCLUSIONS AND SUGGESTIONS

The research evaluates the relationship between financial literacy and business performance among female micro-entrepreneurs in Uzbekistan, focusing on the aspects of financial literacy such as financial education, cash forecasting, and bookkeeping practices. With the use of robust OLS regression analysis, the findings present solid empirical evidence proving that financial literacy is an important predictor of business performance.

First of all, it has been proved that all three dimensions of financial literacy examined in the paper, including financial education, cash forecasting, and bookkeeping practices, significantly and positively affect business performance. Of the three mentioned above, cash forecasting and bookkeeping practices are the most influential. This proves that practical financial skills help improve business performance among women. Thus, those female entrepreneurs who know how to make financial plans and keep records have better chances for running their own successful business.

Secondly, human capital characteristics, such as education and entrepreneurial experience, positively influence business performance. This means that both theoretical education and experience play an important role in enhancing managerial skills and making decisions. In addition, age is revealed as a variable negatively influencing business performance.

Based on the obtained results, one can conclude that financial literacy is a crucial determinant of business performance among female micro-entrepreneurs in Uzbekistan. First of all, it helps develop business skills that are necessary for improving managerial practices and making right decisions. Moreover, it helps entrepreneurs make the work process more efficient and ensures its long-term sustainability. Therefore, financial literacy policies can promote sustainable entrepreneurship and inclusive economic development in the country.

This study relies on cross-sectional OLS regression, which does not fully account for potential endogeneity arising from reverse causality between financial literacy components and business performance, as well as unobserved entrepreneurial ability. Future research could employ instrumental variable (IV) techniques or panel data methods to better establish causal relationships.

As far as policy implications are concerned, the findings prove that there is a need for promoting financial literacy among female entrepreneurs in Uzbekistan, especially in rural areas. Providing them with the necessary training, such as budgeting, cash flow management, and bookkeeping, will lead to improved performance of women's businesses.

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⁸ Note: VIF > 10 indicates problematic multicollinearity. All values are well within the acceptable range. Source: Author's own computation using Stata 16

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