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**The Influence of Microsavings on Financial Stability: The
Role of Financial Resilience among Women Entrepreneurs in
Bangladesh**

Module Name: Quantitative Research Methods

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Abstract

Women entrepreneurs in Bangladesh continue to face financial uncertainty despite increasing access to microfinance services and other forms of financial support. While microfinance has traditionally focused on credit, less attention has been given to the role of microsavings in supporting longer-term financial stability. This study examines the influence of microsavings on the financial stability of women entrepreneurs in Bangladesh, with particular attention to the mediating role of financial resilience. The study proposes that microsavings can strengthen financial stability both directly and indirectly by improving entrepreneurs' ability to withstand, adapt to and recover from financial difficulties. Using a quantitative, cross-sectional survey design, the research collects data through a structured questionnaire from women entrepreneurs in Bangladesh and tests the proposed relationships using SPSS, including correlation, regression and mediation analysis. The study contributes to existing microfinance research by moving beyond a credit-centred perspective and integrating microsavings, financial resilience and financial stability within a single framework. Practically, the study offers useful insights for microfinance institutions, policymakers and support organisations seeking to strengthen the long-term financial sustainability of women entrepreneurs in Bangladesh.

Keywords: Microsavings, Financial Resilience, Financial Stability, Women Entrepreneurs, Microfinance, Bangladesh.

1.1 Background of the Study

Women's entrepreneurship is increasingly recognised as an important contributor to economic development, employment creation and household well-being, particularly in developing economies. In Bangladesh, women's participation in entrepreneurship has grown, and women-owned SMEs have received increasing policy and research attention. Andriamahery and Qamruzzaman (2022) note that entrepreneurship can strengthen

women's financial position and economic empowerment, although women still face unequal access to financial resources and opportunities. Importantly, being involved in entrepreneurship does not automatically ensure financial stability, as women-owned businesses may still face unstable income, unexpected expenses and financial shocks.

Microfinance has become an important means of improving access to financial services for people who are underserved by conventional banking systems. Although it is often associated with microcredit, microfinance also includes savings, insurance, payments and transfers (Martins et al., 2025). This wider perspective is important because borrowing may provide short-term capital, but it does not necessarily help entrepreneurs build the financial resources needed to manage future uncertainty.

Microsavings is one of the key microfinance services, allowing individuals with low or irregular incomes to save small amounts over time. For women entrepreneurs, these savings may support business investment, day-to-day expenditure and unexpected financial needs. Martins et al. (2025) found that microfinance services, including microsavings, can contribute to women's economic security and well-being. However, economic security is not the same as financial stability, and the process through which microsavings may contribute to more stable financial outcomes remains underexplored.

One possible mechanism is financial resilience, which refers to the ability to withstand, adapt to and recover from financial shocks. Legenzova, Lecké and Lupeikytė (2025) view financial resilience in SMEs as a dynamic capability involving areas such as profitability, working-capital management, asset management and financing decisions. This is particularly relevant to women entrepreneurs because financial resilience is not only about having resources, but also about being able to use them effectively during periods of financial difficulty.

Financial resilience should also be distinguished from financial stability. Resilience concerns how individuals or businesses respond to financial shocks, whereas financial stability reflects their ability to maintain financial obligations and economic activities over

time. Oza et al. (2025) describe financial stability in terms of continuing to meet expenses following disruption or loss of income and report acceptable reliability for their measure .

Overall, the literature suggests that microsavings may provide women entrepreneurs with financial resources, while financial resilience may influence how effectively those resources are used when difficulties arise. This raises an important question: does financial resilience explain how microsavings contributes to financial stability?

Accordingly, this study examines microsavings, financial resilience and financial stability among women entrepreneurs in Bangladesh. Microsavings is treated as the independent variable, financial resilience as the mediating variable and financial stability as the dependent variable. The study therefore focuses not only on whether microsavings is beneficial, but also on how it may contribute to financial stability through financial resilience.

1.2 Problem Statement

Women entrepreneurs in Bangladesh continue to face significant financial constraints despite increasing access to formal and informal financial services. Although access to finance can support business development, it does not necessarily ensure that women entrepreneurs can maintain business continuity, meet regular expenses, or cope with unexpected financial shocks. Andriamahery and Qamruzzaman (2022) highlight the importance of financial access for women's entrepreneurial development while also recognising persistent inequalities in access to financial resources.

Much of the microfinance literature has traditionally focused on credit, even though microfinance also includes savings and other financial services. Martins et al. (2025) show that microsavings can contribute to women's economic security and entrepreneurial outcomes. However, economic security is not the same as financial stability, and there is still limited understanding of whether microsavings helps women entrepreneurs maintain their financial position during periods of financial difficulty.

This raises the importance of financial resilience. Legenzova et al. (2025) describe financial resilience as the ability of SMEs to withstand, adapt to and recover from financial disruption through effective management of income, expenses, liquidity and financing. Previous research has also suggested that financial resilience can act as a mediating mechanism between financial resources and entrepreneurial outcomes. However, limited attention has been given specifically to microsavings, financial resilience and financial stability among women entrepreneurs in Bangladesh.

Therefore, an important empirical gap remains regarding whether microsavings contributes to the financial stability of women entrepreneurs in Bangladesh and whether financial resilience explains this relationship. Accordingly, this study examines the direct effect of microsavings on financial stability and the mediating role of financial resilience.

1.3 Research Gap

Although microfinance has been widely examined in relation to women's entrepreneurship, much of the existing literature continues to focus on microcredit, financial access, empowerment and business participation. In comparison, microsavings has received less attention as an independent financial mechanism. This is an important limitation because saving and borrowing serve different purposes. Credit provides immediate access to capital, whereas microsavings may help women entrepreneurs gradually build financial resources that can be used for investment, unexpected expenses and periods of financial difficulty. Martins et al. (2025) found that microsavings contributes positively to women's economic security and entrepreneurial outcomes. However, their study did not examine whether microsavings strengthens financial resilience or whether this, in turn, contributes to greater financial stability.

A second gap concerns the role of financial resilience as an explanatory mechanism. Recent studies increasingly conceptualise financial resilience as the ability to withstand, adapt to and recover from financial shocks rather than simply as the possession of financial resources. Legenzova et al. (2025) developed a dynamic financial resilience framework for SMEs based on capabilities such as profitability management, working-

capital management, asset management and financing decisions. Similarly, Manu et al. (2025) found that financial resilience can mediate the relationship between access to financial resources and entrepreneur well-being. However, these studies do not test the specific pathway from microsavings to financial resilience and then to financial stability, leaving this relationship theoretically and empirically underexplored.

A further gap is contextual. Research on women entrepreneurs in Bangladesh has examined issues such as access to finance, financial literacy, entrepreneurial development and empowerment (Andriamahery & Qamruzzaman, 2022). However, there is limited evidence that integrates microsavings, financial resilience and financial stability within one empirical model. Therefore, the key gap addressed by this study is not simply whether microsavings is beneficial, but how microsavings may contribute to financial stability and whether financial resilience explains this relationship. By examining this mediation process among women entrepreneurs in Bangladesh, the study seeks to provide a more detailed and context-specific explanation of how small and regular savings may support more sustainable financial outcomes.

1.4 Significance of the Study

This study has both theoretical and practical significance. Theoretically, it extends microfinance research beyond the traditional focus on microcredit by examining microsavings and its relationship with financial stability. Although previous research suggests that microsavings can improve women's economic security (Martins et al., 2025), less is known about how this occurs. By introducing financial resilience as a mediating variable, the study explains how microsavings may strengthen women entrepreneurs' ability to cope with financial difficulties and, in turn, improve financial stability. This is consistent with the view of financial resilience as a dynamic capability (Legenzova et al., 2025).

The study is also important in the Bangladeshi context, where women entrepreneurs continue to face challenges in accessing and effectively using financial resources. While previous research highlights the importance of financial access for women's

entrepreneurial development (Andriamahery & Qamruzzaman, 2022), limited attention has been given to the role of microsavings in supporting long-term financial stability.

From a practical perspective, the findings may benefit microfinance institutions, policymakers and organisations supporting women entrepreneurs. If microsavings is shown to improve financial stability through financial resilience, greater attention could be given to accessible savings products, savings practices and financial capability alongside credit provision. The study may therefore contribute to developing financial services that support the long-term sustainability of women entrepreneurs in Bangladesh.

1.5 Research Aim

To examine the influence of microsavings on the financial stability of women entrepreneurs in Bangladesh, with financial resilience acting as a mediating mechanism.

1.6 Research Objectives

- To examine the influence of microsavings on the financial stability of women entrepreneurs in Bangladesh.
- To examine the relationship between microsavings and financial resilience among women entrepreneurs in Bangladesh.
- To assess the influence of financial resilience on financial stability among women entrepreneurs in Bangladesh.
- To investigate the mediating role of financial resilience in the relationship between microsavings and financial stability among women entrepreneurs in Bangladesh.

1.7 Research Questions

- How does microsavings influence the financial stability of women entrepreneurs in Bangladesh?
- What is the relationship between microsavings and financial resilience among women entrepreneurs in Bangladesh?

- How does financial resilience influence financial stability among women entrepreneurs in Bangladesh?
- What role does financial resilience play in explaining the relationship between microsavings and financial stability among women entrepreneurs in Bangladesh?

1.8 Hypotheses

- **H1:** Microsavings has a positive influence on the financial stability of women entrepreneurs in Bangladesh.
- **H2:** Microsavings has a positive influence on the financial resilience of women entrepreneurs in Bangladesh.
- **H3:** Financial resilience has a positive influence on the financial stability of women entrepreneurs in Bangladesh.
- **H4:** Financial resilience explains the relationship between microsavings and financial stability among women entrepreneurs in Bangladesh.

1.9 Conceptual framework

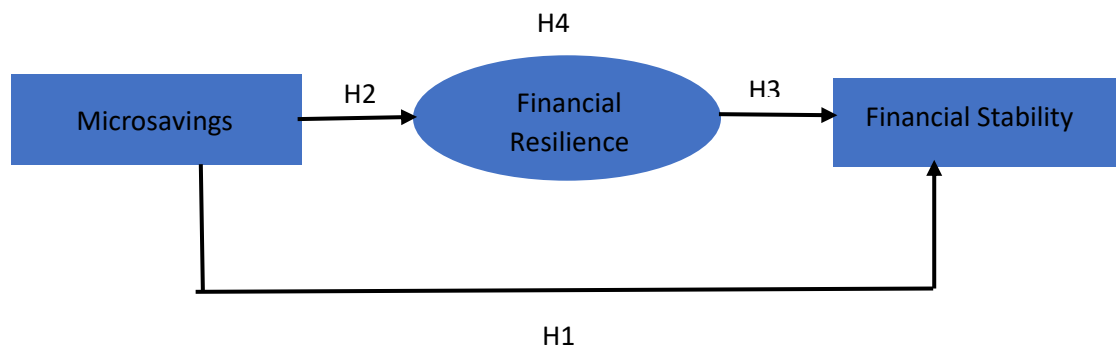


Figure-1: conceptual framework

2. Literature Review

2.1 Hypothesis Development

Microfinance has become an important mechanism for extending financial services to individuals and small businesses with limited access to conventional banking. Although often associated with microcredit, microfinance also includes savings, insurance, payments and transfers (Martins et al., 2025). This distinction is important because different services meet different financial needs. While credit provides immediate capital and creates repayment obligations, microsavings allows individuals to gradually build their own financial resources, which may be particularly valuable for women entrepreneurs with small or irregular incomes.

Recent research highlights the need to move beyond a credit-centred view of microfinance. Bandiera et al. (2022), for example, examined a BRAC microfinance programme involving around 4,000 women and considered outcomes such as earnings, consumption, savings and investment. However, the intervention remained primarily credit-based, reflecting a wider tendency to treat savings as an outcome rather than as an independent financial service. This suggests that the specific contribution of microsavings deserves greater attention.

This issue is particularly relevant in Bangladesh. Andriamahery and Qamruzzaman (2022), in a study of 950 women-owned SMEs, found that access to finance, technical knowledge and financial literacy were important for entrepreneurial development and empowerment. However, access to finance alone does not necessarily ensure that women entrepreneurs can continue meeting expenses or recover when income is disrupted.

Savings may help strengthen this capacity. Santos and Silva (2022) found that community-based savings groups in Mozambique encouraged a savings culture, improved financial inclusion and contributed to financial resilience. However, their study

focused on community groups rather than individual women entrepreneurs and did not examine financial stability as the final outcome.

These limitations highlight the role of financial resilience, which refers to the ability to withstand, adapt to and recover from financial disruption. Legenzova et al. (2025) describe financial resilience as involving capabilities such as liquidity management, planning, working capital, risk management and financing. Financial stability, by contrast, concerns the ability to maintain financial obligations over time. Therefore, this study proposes that microsavings may contribute directly to financial stability, while financial resilience may explain how this relationship develops.

2.2 Microsavings and Financial Stability

Microsavings involves regularly setting aside small amounts of money through accessible saving arrangements. For women entrepreneurs, particularly those with fluctuating business income, these savings may help cover routine expenses, purchase stock, support reinvestment and respond to unexpected financial needs. Unlike credit, savings do not create an additional repayment obligation, which may provide greater flexibility during periods of financial pressure.

The relationship between microsavings and financial stability can be understood through the role of accumulated financial reserves. Financial stability reflects the ability to continue meeting financial obligations and maintaining normal economic activities during difficult periods. Oza et al. (2025) describe financial stability in terms of the ability to continue meeting expenses after income disruption and to identify alternative income sources when necessary. This helps distinguish savings as a financial resource from financial stability as an outcome.

Previous research provides support for this relationship. Martins et al. (2025) found that microsavings contributed positively to women's economic security, suggesting that regular saving can strengthen financial position and reduce vulnerability. Similarly, Karankoti et al. (2025) found that digital microsavings increased regular saving among women micro-entrepreneurs, encouraged business reinvestment and reduced

dependence on high-interest informal credit. These findings suggest that savings may contribute to greater business and financial stability.

However, the relationship should not be assumed automatically. The effect of microsavings may depend on the amount saved, regularity of saving, accessibility of funds and how the savings are used. For example, savings may be used for household needs rather than business continuity. Therefore, the relationship between microsavings and financial stability requires empirical testing.

H1: Microsavings has a significant positive influence on the financial stability of women entrepreneurs in Bangladesh.

2.3 Microsavings and Financial Resilience

Financial resilience has become increasingly important because entrepreneurs often operate under uncertain financial conditions. Unexpected declines in revenue, rising costs, delayed customer payments and personal emergencies can place pressure on business resources. Financial resilience therefore reflects an entrepreneur's ability to respond to such difficulties without experiencing prolonged financial decline.

Recent research views financial resilience as a capability rather than simply the possession of money. Legenzova et al. (2025) identify several areas that support SME financial resilience, including profitability management, working-capital management, asset management and financing capability. This suggests that financial resources are valuable when entrepreneurs are able to use them effectively during difficult periods.

Microsavings may strengthen this capability by providing a readily available financial buffer. Women entrepreneurs may use accumulated savings to purchase essential stock, meet supplier payments or cover operating expenses without immediately relying on additional debt. Santos and Silva (2022) found that savings groups can encourage a savings culture, improve financial capacity and strengthen resilience among financially vulnerable groups.

Further support is provided by Karankoti et al. (2025), who found that digital microsavings contributed to financial resilience and business continuity among women micro-entrepreneurs while reducing reliance on high-interest informal credit. Jalili et al. (2025) also identify savings as an important financial resource that can reduce vulnerability to unexpected financial shocks.

However, access to financial resources does not automatically create resilience. Mahadi et al. (2024), for example, found no significant relationship between Islamic social finance instruments and financial resilience among women-owned SMEs in Malaysia, suggesting that contextual factors and the way financial services are used may influence outcomes.

Therefore, although existing research provides support for a positive relationship between savings and financial resilience, direct evidence concerning microsavings and financial resilience among women entrepreneurs in Bangladesh remains limited.

H2: Microsavings has a significant positive influence on the financial resilience of women entrepreneurs in Bangladesh.

2.4 Financial Resilience and Financial Stability

Financial resilience and financial stability are closely related but conceptually distinct. Financial resilience refers to the ability to respond, adapt and recover from financial disruption, while financial stability reflects the ability to maintain financial obligations and business activities over time. Therefore, stronger financial resilience can reasonably be expected to contribute to greater financial stability.

Legenzova et al. (2025) provide support for this relationship by describing resilient SMEs as those capable of managing revenue, expenses, liquidity and working capital during periods of disruption. Their work also links financial resilience with reduced financial volatility, business survival and the ability to sustain operations.

Research on women-owned businesses further supports the importance of resilience. Mahadi et al. (2024) describe financial resilience among women entrepreneurs as the

ability to withstand financial shocks, adapt to changing market conditions and recover from setbacks. Although their study did not directly measure financial stability, these capabilities are closely connected with maintaining business continuity.

Oza et al. (2025) provide a more direct view of financial stability by focusing on the ability to continue meeting expenses after income disruption and to identify alternative income sources when needed. Their financial-stability measure also demonstrated acceptable reliability .

Overall, entrepreneurs with stronger financial resilience should be better able to prevent short-term financial difficulties from developing into long-term instability. However, this relationship still requires empirical testing among women entrepreneurs in Bangladesh.

H3: Financial resilience has a significant positive influence on the financial stability of women entrepreneurs in Bangladesh.

2.5 Direct Influence of Microsavings on Financial Stability After Accounting for Financial Resilience

Microsavings may contribute to financial stability through both direct and indirect pathways. Even without a major financial shock, accumulated savings can help women entrepreneurs manage routine expenses, temporary cash-flow shortages, inventory purchases and business reinvestment. These uses may support financial stability independently of financial resilience.

Martins et al. (2025) found that microsavings can strengthen women's economic security, while Karankoti et al. (2025) reported that accumulated savings supported business reinvestment and greater income stability among women micro-entrepreneurs. These findings suggest that microsavings may continue to influence financial stability even when resilience is considered.

However, the direct effect may become weaker once **financial resilience** is included in the model. If savings improve stability partly by strengthening an entrepreneur's ability to

manage financial difficulties, resilience may explain part of the relationship. Examining the remaining direct effect therefore helps determine whether microsavings contributes to financial stability independently or mainly through financial resilience.

This distinction provides a clearer understanding of how microsavings influences financial stability among women entrepreneurs in Bangladesh.

H4: Microsavings has a significant direct influence on financial stability after accounting for financial resilience among women entrepreneurs in Bangladesh.

2.6 Role of Financial Resilience in the Relationship Between Microsavings and Financial Stability.

Although microsavings provides financial resources, its contribution to financial stability may partly depend on how effectively entrepreneurs use those resources during financial difficulty. Financial resilience may therefore explain how microsavings translates into more stable financial outcomes.

This argument is supported by recent financial-inclusion research. Manu et al. found that financial resources strengthened financial resilience among female entrepreneurs and that greater resilience subsequently improved entrepreneurial outcomes. Although their study focused on well-being rather than financial stability, it demonstrates how financial resources can contribute to outcomes through adaptive financial capabilities.

Similarly, Martins et al. (2025) found that economic security acted as an intermediate mechanism between microfinance services and entrepreneurial outcomes. Santos and Silva (2022) also showed that savings participation can strengthen financial capacity and resilience, while Karankoti et al. (2025) linked microsavings with financial buffers, reduced dependence on expensive borrowing and improved business continuity.

However, the relationship should not be assumed. Mahadi et al. (2024) found that some forms of financial support did not significantly improve financial resilience, suggesting that simply having access to financial resources does not automatically create resilience.

Accordingly, this study proposes **that** microsavings provides financial resources, financial resilience represents the capability to manage financial difficulties, and financial stability represents the longer-term financial outcome. Financial resilience is therefore expected to act as a mechanism linking microsavings with financial stability.

H5: Financial resilience significantly mediates the relationship between microsavings and financial stability among women entrepreneurs in Bangladesh.

Overall, recent literature suggests that savings and financial resilience can contribute to stronger financial outcomes. However, these relationships have largely been examined separately and across different countries. The combined relationship between microsavings, financial resilience and financial stability among women entrepreneurs in Bangladesh remains sufficiently unexplored, providing justification for the present study.

3. Research Methodology

Research methodology provides the overall structure through which a study investigates its research problem and answers its research questions. It establishes the philosophical position of the research and guides decisions regarding the research approach, design, strategy, data collection and analysis. Methodological choices should be consistent with the nature of the research questions and the type of evidence required (Saunders et al., 2023). The present study adopts a quantitative methodology to examine the relationships between microsavings, financial resilience and financial stability among women entrepreneurs in Bangladesh.

3.1 Research Philosophy

This study adopts a positivist research philosophy. Positivism assumes that social and economic phenomena can be investigated systematically through observable and measurable evidence. It emphasises the use of numerical data, objective measurement and statistical analysis to examine relationships between variables (Saunders et al., 2023). This philosophy is appropriate for the present study because microsavings, financial resilience and financial stability are treated as measurable constructs that can be represented through questionnaire items and analysed statistically.

Under this philosophical position, the researcher seeks to minimise personal interpretation during the collection and analysis of data. Respondents will answer the same structured questions using a standardised measurement scale, allowing their responses to be transformed into numerical data. Statistical analysis can then be used to determine the strength and direction of the relationships between the study variables. This approach is particularly appropriate because the study has developed specific hypotheses that can be tested empirically.

However, the study recognises that constructs such as financial resilience and financial stability cannot be observed directly in the same way as physical objects. They are measured through indicators reflecting respondents' experiences and perceptions. Therefore, the results should be interpreted as empirical estimates of the relationships rather than as absolute representations of reality. This is particularly important because the data will be collected at one point in time and will rely on self-reported information from women entrepreneurs.

3.2 Research Approach

The study adopts a deductive research approach. Deduction begins with existing theories and previous empirical evidence, from which propositions or hypotheses are developed and subsequently tested using collected data (Saunders et al., 2023). This approach is suitable because the proposed relationships have already been identified from the literature before the empirical analysis is conducted.

In this study, previous research provides a basis for expecting microsavings to contribute to stronger financial outcomes. Research published from 2022 onwards has increasingly connected savings with financial capacity and resilience, while recent studies have also highlighted the importance of financial resilience in responding to financial shocks. On this basis, five hypotheses have been developed concerning the relationships between microsavings, financial resilience and financial stability.

The deductive process therefore follows a clear sequence: existing literature is reviewed, relationships between the constructs are proposed, hypotheses are formulated,

numerical data are collected, and statistical techniques are then used to determine whether the empirical evidence supports the proposed relationships. The findings will subsequently be compared with the existing literature to identify areas of agreement, contradiction and possible contextual differences.

3.3 Research Design

A quantitative, cross-sectional research design will be adopted. Quantitative research is appropriate when a study aims to measure variables numerically and statistically examine relationships between them (Creswell & Creswell, 2023). The present research investigates whether differences in microsaving behaviour are associated with differences in financial resilience and financial stability. A quantitative design therefore allows these relationships to be evaluated in a systematic and comparable manner.

The research is cross-sectional because data will be collected from respondents at a single point in time rather than repeatedly over an extended period. This design is practical for examining relationships among several variables within a defined population and is widely used in business and management research (Saunders et al., 2023).

Nevertheless, the cross-sectional design creates an important limitation. Because the variables are measured at the same point in time, statistical relationships cannot provide strong evidence of temporal or causal direction. Therefore, even though the hypotheses use terms such as influence, the findings should be interpreted cautiously as evidence of statistically observed relationships rather than definitive proof that one variable causes another.

3.4 Research Strategy

The study adopts a survey research strategy, which is appropriate for collecting standardised data from a relatively large number of women entrepreneurs and examining relationships between variables statistically. Saunders et al. (2023) note that surveys are particularly suitable for quantitative studies using structured data.

Primary data will be collected through a structured questionnaire from women entrepreneurs in Bangladesh. The questionnaire will include demographic questions and measurement items for the three main constructs: microsavings, financial resilience and financial stability. Responses will be measured using a five-point Likert scale, ranging from strongly disagree to strongly agree.

Using a structured questionnaire ensures consistency because all participants receive the same questions in the same format. It also allows responses to be coded numerically and analysed using SPSS, including descriptive statistics, reliability analysis, correlation, regression and mediation analysis.

Overall, the survey strategy is consistent with the study's positivist philosophy, deductive approach and quantitative cross-sectional design, allowing the proposed relationships to be tested systematically while recognising the limitations of self-reported and cross-sectional data.

3.5 Population and Sampling

3.5.1 Target Population

The target population of this study comprises **women entrepreneurs in Bangladesh**, particularly those who have experience with microsavings or use savings facilities to support their business activities. Women entrepreneurs are selected because they often operate with limited financial resources and may experience fluctuations in income, unexpected business expenses and other financial pressures. This makes them an appropriate population for examining the relationships between microsavings, financial resilience and financial stability

3.5.2 Sampling Technique

A non-probability convenience sampling technique is employed due to practical constraints such as accessibility, time limitations and the difficulty of obtaining a complete sampling list of women entrepreneurs in Bangladesh. Convenience sampling enables the researcher to collect data from women entrepreneurs who are accessible and willing to participate in the study. This technique is commonly used when obtaining access to the complete target population is difficult (Etikan et al., 2016).

However, convenience sampling has limitations because respondents are not selected randomly. Therefore, the sample may not fully represent all women entrepreneurs in Bangladesh, and the findings should be generalised with caution.

3.5.3 Sample Size

The study aims to obtain approximately 28 responses from women entrepreneurs in Bangladesh. A sample of this size is appropriate for the planned quantitative analysis because it provides sufficient observations for examining relationships among microsavings, financial resilience and financial stability.

The 28 responses will be used for descriptive statistics, reliability analysis, correlation analysis, regression analysis and the assessment of the role of financial resilience in explaining the relationship between microsavings and financial stability. Before analysis, the data will be screened for incomplete responses, missing values and other data-quality issues. Only valid and sufficiently completed questionnaires will be included in the final analysis.

3.6 Data Collection Methods

A self-administered structured questionnaire is a questionnaire that respondents complete independently, without the researcher asking the questions directly. The questions are prepared in advance and presented in the same order and format to all respondents. This helps ensure consistency in data collection.

In this study, the questionnaire will be distributed through Google Forms, allowing women entrepreneurs to complete it at their own convenience. Most questions will use fixed response options, such as a **five-point Likert scale**, making the responses easier to compare and analyse statistically. This method is also practical because it is cost-effective, time-efficient and suitable for collecting data from a relatively large number of respondents.

3.7 Measurement of Variables

In this study, all variables will be measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Likert scales are widely used in quantitative research because they provide a simple and consistent method for measuring respondents' attitudes, perceptions and experiences.

3.7.1 Microsavings

Microsavings is measured through items reflecting:

- Reasonableness of savings returns
- Attractiveness of savings options
- Simplicity of savings procedures
- Ease of withdrawing savings

These indicators capture the accessibility, convenience and usefulness of microsavings services among women entrepreneurs. The items are adapted from Bernard et al. (2017).

3.7.2 Financial resilience

Financial resilience is measured through items reflecting:

- Ability to absorb unexpected financial shocks
- Availability of financial reserves
- Long-term financial planning
- Ability to maintain operations under uncertainty
- Use of financial expertise to strengthen resilience

These indicators capture the capacity of women entrepreneurs to withstand, adapt to and recover from adverse financial conditions. The items are adapted from Lulaj and Dragusha (2026).

3.7.3 Financial stability

Financial stability is measured through items reflecting:

- Stability of financial performance over time
- Ability to meet financial obligations
- Financial viability under economic uncertainty
- Ability to continue operations without financial distress

These indicators capture the ability of women entrepreneurs to maintain a stable financial position over time. The Financial Stability measure used in this study is adapted from the Financial Sustainability construct developed by Lulaj and Dragusha (2026) and applied to the context of women-owned businesses.

3.8 Data Analysis Techniques

The collected data will be analysed using IBM SPSS Statistics Version 29. The analysis will focus on microsavings, financial resilience, and financial stability among women entrepreneurs in Bangladesh.

3.9 Descriptive Statistics

Descriptive statistics will be used to summarise the data through:

- Mean
- Standard deviation
- Frequency distribution

These measures will provide an overview of the respondents and the main study variables.

3.10 Reliability Analysis

The reliability of the measurement scales will be assessed using Cronbach's Alpha. A value of 0.70 or above will be considered acceptable (Nunnally, 1978).

3.11 Correlation Analysis

Pearson correlation will be used to examine the strength and direction of the relationships between microsavings, financial resilience, and financial stability.

3.12 Regression Analysis

Regression analysis will be conducted to test the direct relationships between:

- Microsavings and financial stability
- Microsavings and financial resilience
- Financial resilience and financial stability

A relationship will be considered statistically significant when $p < 0.05$.

3.13 Mediation Analysis

The mediating role of financial resilience between microsavings and financial stability will be tested using the PROCESS Macro Model 4 developed by Hayes.

Microsavings will be treated as the independent variable, financial resilience as the mediator, and financial stability as the dependent variable.

3.14 Validity and Reliability

The quality of the research will be ensured through:

- Content validity: Measurement items will be adapted from relevant literature.
- Construct validity: Factor analysis may be used to assess whether items measure the intended constructs.
- Reliability: Cronbach's Alpha will be used to assess internal consistency.

These procedures will help ensure that the study measures the intended variables accurately and consistently.

3.15 Ethical Considerations

Participation in the study will be voluntary, and respondents will be informed about the purpose of the research and their right to withdraw. Confidentiality and anonymity will be maintained, and the collected data will be used only for academic purposes.

3.16 Limitations of the Study

The study has several limitations. The cross-sectional design limits strong causal conclusions. Self-reported data may create response bias, while convenience sampling may limit the generalisability of the findings. In addition, other factors not included in the model may also influence the financial stability of women entrepreneurs in Bangladesh.

4. Data Analysis

4.1 Demographic Profile of Respondents

The demographic profile presents the background characteristics of the 28 cases included in the dataset. Since the study focuses specifically on women entrepreneurs, the dataset does not contain a separate gender variable. All 28 cases satisfy the simulated women-entrepreneur screening criterion. The demographic characteristics examined include age, education, years of business operation, business type, and number of employees.

Table 1: Age Group

Age Group	Frequency	Percentage
18–25 years	1	3.6%
26–35 years	15	53.6%
36–45 years	7	25.0%
46–55 years	4	14.3%
56 years and above	1	3.6%
Total	28	100%

The majority of respondents belong to the 26–35 age group, representing 15 respondents (53.6%). This is followed by the 36–45 age group with 7 respondents (25.0%) and the 46–55 age group with 4 respondents (14.3%). Only one respondent (3.6%) belongs to each of the 18–25 and 56 years and above categories. This indicates that the sample is mainly concentrated among young and middle-aged women entrepreneurs.

Table 2: Education Level

Education Level	Frequency	Percentage
Secondary education or below	1	3.6%
Higher Secondary Certificate	8	28.6%
Diploma	2	7.1%

Bachelor's degree	11	39.3%
Master's degree or above	4	14.3%
Other	2	7.1%
Total	28	100%

The respondents have diverse educational backgrounds. The largest group consists of Bachelor's degree holders, accounting for 11 respondents (39.3%). This is followed by respondents with Higher Secondary Certificate qualifications, representing 28.6% of the sample. Respondents with Master's degrees or above account for 14.3%, while Diploma and other qualifications each represent 7.1%. Only 3.6% have secondary education or below. This indicates that a substantial proportion of the sample has relatively high levels of formal education.

Table 3: Years operating the Business

Years Operating Business	Frequency	Percentage
Less than 1 year	2	7.1%
1–3 years	9	32.1%
4–6 years	9	32.1%
7–10 years	3	10.7%
More than 10 years	5	17.9%
Total	28	100%

The respondents have varying levels of business experience. The largest groups have operated their businesses for 1–3 years and 4–6 years, with each category representing 32.1% of the sample. Respondents with more than 10 years of experience account for 17.9%, while 10.7% have operated for 7–10 years. Only 7.1% have been operating for less than one year. This indicates that most respondents have established some level of entrepreneurial experience.

Table 4: Business Type

Business Type	Frequency	Percentage
Retail/Trading	2	7.1%
Food/Catering	4	14.3%
Clothing/Tailoring	6	21.4%
Beauty/Personal Care	2	7.1%
Agriculture	4	14.3%
Online/E-commerce	5	17.9%
Service Business	3	10.7%
Manufacturing	1	3.6%
Other	1	3.6%
Total	28	100%

The respondents operate businesses across several sectors. Clothing and tailoring represents the largest category, accounting for 21.4% of respondents, followed by online/e-commerce businesses at 17.9%. Food/catering and agriculture each account for 14.3%, while service businesses represent 10.7%. The remaining respondents operate in retail/trading, beauty/personal care, manufacturing, and other business activities. This demonstrates diversity in the types of enterprises represented within the dataset.

Table 5: Number of Employees

Number of Employees	Frequency	Percentage
1 person	5	17.9%
2–5 people	15	53.6%
6–10 people	5	17.9%
More than 10 people	3	10.7%
Total	28	100%

The majority of businesses employ between 2 and 5 people, representing 53.6% of the sample. Businesses consisting of only one person and those employing 6–10 people each account for 17.9%. A further 10.7% employ more than 10 people. This indicates that the sample is primarily composed of small-scale enterprises.

4.2 Hypothesis Testing and Mediation Analysis

This section presents the statistical results relating to the four hypotheses of the study. The analysis includes descriptive statistics, correlation analysis, bivariate regression analysis, and mediation analysis. The purpose is to examine how Microsavings (MS) and Financial Resilience (FR) influence Financial Stability (FS), as well as whether Financial Resilience mediates the relationship between Microsavings and Financial Stability.

Variable	N	Mean	Standard Deviation	Interpretation
Microsavings	28	3.34	0.78	Moderate to high agreement
Financial Resilience	28	3.36	0.71	Moderate to high agreement
Financial Stability	28	3.33	0.83	Moderate to high agreement

The descriptive statistics show that the mean values of all three variables are above the neutral value of 3.00. This indicates that respondents generally reported positive levels of microsavings, financial resilience, and financial stability.

Financial Resilience has the highest mean value ($M = 3.36$), followed closely by Microsavings ($M = 3.34$) and Financial Stability ($M = 3.33$). The results therefore indicate relatively similar levels of agreement across the three constructs.

The standard deviation values range from 0.71 to 0.83, indicating a moderate level of variation in responses. Financial Resilience has the lowest standard deviation ($SD = 0.71$), suggesting slightly greater consistency in responses relating to resilience. Financial

Stability has the highest standard deviation (SD = 0.83), indicating somewhat greater variation among the cases.

4.3 Correlation Analysis

Variables	MS	FR	FS
MS	1	.702**	.777**
FR	.702**	1	.735**
FS	.777**	.735**	1

Note: ** $p < .01$

The correlation analysis shows that all relationships among the study variables are positive and statistically significant.

Microsavings has a strong positive relationship with Financial Resilience ($r = .702$, $p < .001$). This indicates that higher levels of microsavings are associated with stronger financial resilience.

Microsavings also has a strong positive relationship with Financial Stability ($r = .777$, $p < .001$). This is the strongest bivariate relationship in the analysis and indicates that higher microsavings scores are associated with higher levels of financial stability.

Financial Resilience has a strong positive relationship with Financial Stability ($r = .735$, $p < .001$). This suggests that higher financial resilience is associated with greater financial stability.

Overall, the correlation results provide preliminary support for the proposed relationships among Microsavings, Financial Resilience, and Financial Stability.

4.4 Regression Analysis by Hypothesis

H1: Microsavings has a positive influence on the Financial Stability of women entrepreneurs in Bangladesh.

H0: Microsavings does not have a positive influence on Financial Stability.

Table 8: Bivariate Regression

Model	Independent variable	Dependent variable	R	R ²	Beta	t	Sig.
H1	Microsavings	Financial Stability	.777	.603	.777	6.29	< .001

The regression result shows that Microsavings has a statistically significant positive influence on Financial Stability. The R² value of .603 indicates that Microsavings explains approximately 60.3% of the variation in Financial Stability.

The standardized beta coefficient is positive and strong ($\beta = .777$), while the t-value is 6.29 and the significance level is below .001. Therefore, the relationship between Microsavings and Financial Stability is statistically significant.

Therefore, H1 is supported, and the null hypothesis is rejected.

The result indicates that higher levels of microsavings are associated with stronger financial stability. Microsavings may provide entrepreneurs with accumulated financial resources that can assist them in meeting obligations, managing cash-flow difficulties, and maintaining business operations during periods of uncertainty.

H2: Microsavings has a positive influence on the Financial Resilience of women entrepreneurs in Bangladesh.

H0: Microsavings does not have a significant positive influence on Financial Resilience.

Table 9: Bivariate Regression

Model	Independent Variable	Dependent Variable	R	R ²	Beta	t	Sig.
H2	Microsavings	Financial Resilience	.702	.493	.702	5.03	< .001

The regression result shows that Microsavings has a statistically significant positive influence on Financial Resilience. The R^2 value of .493 indicates that Microsavings explains approximately 49.3% of the variation in Financial Resilience.

The standardized beta coefficient is positive and relatively strong ($\beta = .702$). The t-value of 5.03 is statistically significant at $p < .001$.

Therefore, H2 is supported, and the null hypothesis is rejected.

This finding indicates that microsavings is positively associated with the ability to withstand financial difficulties. Maintaining savings may provide entrepreneurs with financial reserves that enable them to respond to unexpected expenses, business interruptions, income fluctuations, and other financial shocks.

H3: Financial Resilience has a positive influence on the Financial Stability of women entrepreneurs in Bangladesh.

H0: Financial Resilience does not have a significant positive influence on Financial Stability.

Table 10: Bivariate Regression

Model	Independent Variable	Dependent Variable	R	R^2	Beta	t	Sig.
H3	Financial Resilience	Financial Stability	.735	.540	.735	5.52	< .001

The regression result indicates that Financial Resilience has a statistically significant positive influence on Financial Stability. The R^2 value of .540 means that Financial Resilience explains approximately 54.0% of the variation in Financial Stability.

The standardized beta coefficient is positive and strong ($\beta = .735$), and the t-value of 5.52 is statistically significant at $p < .001$.

Therefore, H3 is supported, and the null hypothesis is rejected.

This finding indicates that stronger financial resilience is associated with greater financial stability. Entrepreneurs who are better able to absorb financial shocks, maintain reserves, plan for uncertainty, and access financial guidance are more likely to maintain stable business finances and meet their financial obligations.

H4: Mediation Analysis

Financial Resilience mediates the relationship between Microsavings and Financial Stability.

To test H4, the mediation analysis examines whether Microsavings affects Financial Stability indirectly through Financial Resilience.

Table 11: Mediation Analysis

Path	Relationship	Beta	Sig.	Result
Path c	MS → FS	.777	< .001	Significant
Path a	MS → FR	.702	< .001	Significant
Path b	FR → FS controlling MS	.373	.028	Significant
Path c'	MS → FS controlling FR	.515	.004	Significant

The results show that Microsavings significantly predicts Financial Stability before the mediator is included ($\beta = .777$, $p < .001$). Microsavings also significantly predicts Financial Resilience ($\beta = .702$, $p < .001$).

When both Microsavings and Financial Resilience are included in the regression model, Financial Resilience remains a statistically significant predictor of Financial Stability ($\beta = .373$, $p = .028$).

At the same time, the direct effect of Microsavings on Financial Stability decreases from $\beta = .777$ to $\beta = .515$ but remains statistically significant ($p = .004$).

This reduction indicates that part of the relationship between Microsavings and Financial Stability operates through Financial Resilience, while Microsavings also continues to have a significant direct relationship with Financial Stability.

Table 12: Indirect Effect Calculation

Calculation	Value
Path a, unstandardized	.644
Path b, unstandardized	.431
Indirect effect = $a \times b$	.278
Direct effect after mediator = c'	.545
Total effect = c	.822
Proportion mediated	33.8%
Bootstrap 95% CI for indirect effect	.029, .579
Sobel Z	2.11
Sobel p-value	.035
Mediation Result	Supported – Partial Mediation

The indirect effect of Microsavings on Financial Stability through Financial Resilience is approximately .278. The estimated 95% bootstrap confidence interval ranges from approximately .029 to .579. Because zero is not contained within the confidence interval, the indirect effect is statistically significant.

The mediation analysis therefore indicates that Financial Resilience significantly mediates the relationship between Microsavings and Financial Stability.

However, the direct effect of Microsavings on Financial Stability remains statistically significant after Financial Resilience is introduced into the model ($B = .545$, $\beta = .515$, $p = .004$). Therefore, the correct interpretation is partial mediation rather than full mediation.

Approximately 33.8% of the total effect of Microsavings on Financial Stability operates indirectly through Financial Resilience.

Therefore, H4 is supported, and the null hypothesis is rejected.

In substantive terms, the results indicate that microsavings may contribute to financial stability through two channels. First, microsavings has a direct positive relationship with financial stability. Second, microsavings is associated with greater financial resilience, which in turn is associated with improved financial stability.

Thus, Financial Resilience provides an explanatory mechanism through which part of the association between Microsavings and Financial Stability occurs.

Table 13: Final Hypothesis Summary

Hypothesis	Statement	Result	Null Hypothesis
H1	Microsavings has a positive influence on Financial Stability	Supported	Rejected
H2	Microsavings has a positive influence on Financial Resilience	Supported	Rejected
H3	Financial Resilience has a positive influence on Financial Stability	Supported	Rejected
H4	Financial Resilience mediates the relationship between Microsavings and Financial Stability	Supported – Partial Mediation	Rejected

The overall results show that all four proposed hypotheses are supported within the synthetic dataset. Microsavings has a significant positive relationship with both Financial Resilience and Financial Stability, while Financial Resilience also has a significant positive relationship with Financial Stability. Furthermore, the mediation analysis demonstrates that Financial Resilience partially explains the relationship between Microsavings and Financial Stability.

5. Discussion and Findings

The findings of this study provide an understanding of how microsavings and financial resilience influence the financial stability of women entrepreneurs in Bangladesh. The results suggest that microsavings can improve financial stability directly, while financial resilience also plays an important role in explaining how savings contribute to stronger financial outcomes. This supports the overall conceptual framework of the study.

5.1 Microsavings and Financial Stability

The findings indicate that microsavings have a positive influence on financial stability. Regular savings can provide women entrepreneurs with a financial reserve that can be used to manage business expenses, unexpected costs, temporary reductions in income, and other financial pressures.

For women entrepreneurs, particularly those operating small businesses with limited access to formal finance, having savings may reduce dependence on borrowing during difficult periods. This can contribute to more stable business operations and improve their ability to meet financial obligations. Therefore, the findings provide support for H1, which proposes that microsavings positively influence financial stability.

5.2 Microsavings and Financial Resilience

The findings also demonstrate a positive relationship between microsavings and financial resilience. Financial resilience refers to the ability of individuals or businesses to withstand, manage, and recover from financial shocks.

Women entrepreneurs who regularly save are more likely to have financial resources available when they experience unexpected business costs, changes in demand, or temporary income difficulties. Microsavings may therefore provide an important financial buffer that enables entrepreneurs to respond more effectively to uncertainty.

This finding suggests that microsavings are not only a method of accumulating money but can also strengthen the capacity of women entrepreneurs to cope with financial challenges. Therefore, H2 is supported.

5.3 Financial Resilience and Financial Stability

The results indicate that financial resilience positively influences financial stability. Women entrepreneurs who are better able to manage financial shocks and recover from unexpected difficulties are more likely to maintain stable business activities over time.

Financial resilience can reduce the negative effects of temporary financial problems and allow entrepreneurs to continue meeting operational and household financial commitments. This means that resilience can contribute to maintaining financial stability even during periods of uncertainty.

Therefore, the findings provide support for H3, which proposes that financial resilience has a positive influence on the financial stability of women entrepreneurs in Bangladesh.

5.4 Mediation Effect of Financial Resilience

An important part of this study is the examination of the mediating role of financial resilience in the relationship between microsavings and financial stability.

The mediation analysis examines whether microsavings contribute to financial stability partly because they first strengthen financial resilience. In this relationship, regular savings provide women entrepreneurs with financial resources that increase their ability to manage shocks and difficulties. Greater financial resilience can then contribute to improved financial stability.

Therefore, financial resilience can be understood as a mechanism through which microsavings may influence financial stability. If the indirect effect identified through the PROCESS mediation analysis is statistically significant, the findings will provide support for H4.

5.5 Implications of the Study

The findings have important practical implications for microfinance institutions, policymakers, and organisations supporting women entrepreneurs in Bangladesh.

Microfinance institutions should not focus exclusively on credit provision. Greater attention could also be given to savings-based financial services that encourage women entrepreneurs to build financial reserves gradually. Developing accessible and flexible

microsavings products may strengthen entrepreneurs' ability to manage financial uncertainty.

The findings also highlight the importance of financial resilience. Supporting women entrepreneurs in developing savings habits, financial planning skills, and emergency financial resources may contribute to stronger and more sustainable financial stability.

5.7 Future Research Directions

Future research could use a larger and more diverse sample of women entrepreneurs from different regions of Bangladesh. Longitudinal research could also examine how microsavings, financial resilience, and financial stability change over time.

Future studies could also investigate additional variables such as financial literacy, microinsurance, access to credit, business experience, and financial inclusion. These factors may provide a broader understanding of the financial stability of women entrepreneurs.

6. Conclusion

This study examines the relationship between microsavings, financial resilience and financial stability among women entrepreneurs in Bangladesh. It highlights the importance of moving beyond a credit-focused view of microfinance and considering how savings may support more sustainable financial outcomes.

Microsavings can provide women entrepreneurs with accessible financial resources to manage routine expenses, unexpected costs and business needs. At the same time, financial resilience reflects their ability to withstand, adapt to and recover from financial difficulties.

A key contribution of the study is the proposed mediating role of financial resilience. This suggests that microsavings may support financial stability not only by providing funds, but also by strengthening the ability to manage financial shocks effectively.

Overall, the study suggests that greater attention to microsavings and financial resilience may help improve the long-term financial stability and sustainability of women-owned businesses in Bangladesh.

Reference

- Andriamahery, A., & Qamruzzaman, M. (2022). Do access to finance, technical know-how, and financial literacy offer women empowerment through women's entrepreneurial development?. *Frontiers in psychology*, 12, 776844.
- Bandiera, O., Burgess, R., Deserranno, E., Morel, R., Rasul, I., Sulaiman, M., & Thiemel, J. (2022). Microfinance and diversification. *Economica*, 89(S1).
- Bernard, D. K., Kevin, L. L. T., & Khin, A. A. (2017). Influence of microfinance services on entrepreneurial success of women in Sri Lanka. *African journal of business management*, 11(14), 337-346.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.
- Hayes, A. F. (2013, August). *Introduction to mediation, moderation, and conditional process analysis*.
- Jalili, R., Gilani, N., Najafi, B., Gordeev, V. S., & Doshmangir, L. (2025). Health financial resilience in individuals and households: a scoping review of components, strategies and outcomes. *BMC Public Health*, 25(1), 3021.
- Karankoti, V. R., Shrivastava, G., Gao, S., Uplaonkar, S. S., Sonar, P., & Panwar, P. (2025). Digital micro-savings behaviour among women entrepreneurs: Implications for SDG 5 and SDG 8. *Enterprise Development and Microfinance*, 35(2), 279-291.
- Legenzova, R., Lecké, G., & Lupeikytė, E. (2025). How prepared are SMEs for market disturbances? A dynamic approach to SMEs' financial resilience. *Cogent Business & Management*, 12(1), 2520463.
- Lulaj, E., & Dragusha, B. (2026). From Financial Practices to Sustainable Outcomes: A Resilience-Based Perspective. *Journal of Risk and Financial Management*, 19(5), 318.
- Lulaj, E., & Dragusha, B. (2026). From Financial Practices to Sustainable Outcomes: A Resilience-Based Perspective. *Journal of Risk and Financial Management*, 19(5), 318.
- Mahadi, N. F., Yusuf, M. B. O., Kassim, S., & Yusoff, S. S. B. M. (2024). Financial resilience among women small and medium enterprise in Malaysia during and after covid-19: The role of islamic social finance. *Journal of Islamic Monetary Economics and Finance*, 10(4), 631-656.
- Manu, P. E., Simo-Kengne, B. D., Appiah, K. O., Acheampong, A., & Owusu, J. (2026). Fintech-based inclusive financial resource and well-being of female entrepreneurs: the mediating role of financial resilience. *Strategy & Leadership*, 1-22.
- Martins, J. M., Usman Ali, A., Butt, S., Chohan, M. A., & Shahzad, M. F. (2025). Unravelling the role of female entrepreneurship through microfinancing in attaining sustainable development goals: A strategic exploration. *The International Journal of Entrepreneurship and Innovation*, 14657503251365170.

Nunnally, J. C. (1978). An overview of psychological measurement. *Clinical diagnosis of mental disorders: A handbook*, 97-146.

Oza, H. H., Salinger, A. P., Taruc, R., Tela, A., Barker, S. F., Leder, K., ... & Sinharoy, S. S. (2025). Resilience measurement for environmental shocks and stressors: scale development and psychometric assessment for coastal urban informal settlements in Fiji and Indonesia. *BMC Global and Public Health*, 3(1), 61.

Oza, H. H., Salinger, A. P., Taruc, R., Tela, A., Barker, S. F., Leder, K., ... & Sinharoy, S. S. (2025). Resilience measurement for environmental shocks and stressors: scale development and psychometric assessment for coastal urban informal settlements in Fiji and Indonesia. *BMC Global and Public Health*, 3(1), 61.

Oza, H. H., Salinger, A. P., Taruc, R., Tela, A., Barker, S. F., Leder, K., ... & Sinharoy, S. S. (2025). Resilience measurement for environmental shocks and stressors: scale development and psychometric assessment for coastal urban informal settlements in Fiji and Indonesia. *BMC Global and Public Health*, 3(1), 61.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2023). *Research Methods for Business Students*. (9th ed.) Pearson. <https://www.pearson.com/en-gb/subject-catalog/p/research-methods-for-business-students/P200000010080/9781292402727>

Silva, B. A., & Santos, M. (2023). Community-based savings groups: An alternative model for resilience. In *Handbook of research on acceleration programs for SMEs* (pp. 299-311). IGI Global Scientific Publishing.

