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Research Article

Financial Adequacy on the Innovation and Wealth Generation Among Women Entrepreneurs in North-Central Nigeria

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ABSTRACT

Over the years, adequate financial resources are very essential for driving innovation and supporting long-term business sustainability. Women entrepreneurs who have access to adequate financial backing are more likely to invest in research and development, which is critical for introducing new products and expanding market presence. Despite their contributions, women entrepreneurs in North-Central Nigeria face significant barriers, with limited adequacy in terms of finance being one of the most pervasive. With this, the study examines the effect of financial adequacy on the innovation and wealth generation among women entrepreneurs in North-Central Nigeria. The study adopted a cross-sectional survey research design and the population was 37,690 and employing the Taro Yamane formula the sample size of the study became 396. Primary data was used to collect information from the respondents by using a structured questionnaire. Also, the Ordinal Logistic Regression tool of analysis was employed to regressed the data gotten from the respondents and the finding revealed that financial adequacy [Asset Quality (ASSQ = 0.1463, $p < 0.00$); and Cash Flows (CASF = 0.0881, $p < 0.01$) has a positive and significant effect on innovation and wealth generation (creativity) among women entrepreneurs in North-Central Nigeria. Based on this, the study recommends that because it indicated that financial adequacy promotes innovation and wealth generation, the Central Bank of Nigeria (CBN) and commercial banks should keep on designing innovation-linked financial products that offer larger asset quality and cash flow to women who demonstrate investment in business innovation, such as acquiring technology, hiring skilled workers, or entering new markets. These financial products should also provide flexible repayment terms and financial advisory support to ensure funds are used effectively.

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Introduction

All over the world, financial adequacy, or the sufficiency of financial resources, is an added critical factor influencing the success of women-owned businesses. Globally, women entrepreneurs often receive smaller loans than their male counterparts, limiting their ability to make substantial investments. In sub-Saharan Africa, for instance, women entrepreneurs receive 23% smaller loans on average compared to men, despite owning nearly 50% of the region's SMEs (World Bank, 2021). In Nigeria, and particularly in North-Central Nigeria, financial adequacy is a major concern. Women entrepreneurs often receive microloans that are insufficient to meet the capital needs required for business expansion, technology adoption, and skilled labor.

Adequate financial resources are also essential for driving innovation and supporting long-term business sustainability. Women entrepreneurs who have access to adequate financial backing are more likely to invest in research and development, which is critical for introducing new products and expanding market presence. The Goldman Sachs "10,000 Women" Initiative (2020) found that women entrepreneurs who received sufficient financial support saw a 55% increase in business revenues, compared to those who lacked financial backing. In North-Central Nigeria, financial inadequacy continues to constrain women entrepreneurs, limiting their ability to innovate and scale their businesses. This study will analyze the effect of financial adequacy on innovation and wealth generation, assessing how sufficient financial resources can drive product innovation and improve business performance among women entrepreneurs in the region.

The ability to create new concepts and inventions is one of the businesses' top priorities, as women CEOs and entrepreneurs in North-Central Nigeria are likely to tell everyone. Due to the rise of the information economy, fierce international competition, and significant technological advancements, innovation is now more important than ever in the competitive landscape. Organizations create the new systems, procedures, and products needed to adjust to shifting markets, technological advancements, and competitive strategies through innovation (Dougherty & Hardy, 1996). Success performance obstacles have significantly grown as businesses place a greater emphasis on innovation. Just staying the same, let alone improving competitive position, requires increasing levels of dedication to innovation. But it is been hard and challenging to manage the risky and complicated process of innovation (Kanter, 1983).

Wealth creation and innovation are inextricably intertwined. By improving productivity, cutting expenses, and creating new value, innovation - whether in the form of new goods, procedures, or business models - can spur the development of wealth. Economic expansion, higher living standards, and general societal advantages result from this. The issue of financial adequacy is central to the innovation and wealth generation of women entrepreneurs in North-Central Nigeria. The structural barriers that limit adequacy to financial services-ranging from the lack of asset quality, cash flow, asset base and financial inadequacy-must be addressed to unlock the full potential of women entrepreneurs in the region. This study provided a comprehensive analysis of how financial adequacy affects innovation, and wealth generation, offering valuable insights for policymakers, financial institutions, and development organizations committed to enhancing the entrepreneurial ecosystem for women in Nigeria and beyond.

Ascertaining how financial adequacy impacted the innovation and wealth generation among women entrepreneurs in North-Central Nigeria was the main objective of this study. Additional related objectives include determining the impact of asset quality on creativity among women entrepreneurs in North-Central Nigeria and examine the impact of cash flows on creativity among women entrepreneurs in North-Central Nigeria

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The inputs of this work stems from the fact that in order to determine which financial adequacy was applied more successfully in terms of creativity, it first fills in gaps in the literature, especially with regard to women entrepreneurs in North-Central Nigeria. It does this by using the Ordinal Logistic Regression tool of analysis to regress the data, which has been largely omitted or not used by previous studies. Second, using a combination of the two-financial adequacy proxies (asset quality and cash flows) and questionnaire factors, it uses a cross sectional survey data model as a methodological enhancement to look into the financial adequacy among women entrepreneurs in North-Central Nigeria from 2023 to 2024.

Literature Review

Concept of Financial Adequacy

Financial adequacy refers to the sufficiency of financial resources provided to women entrepreneurs. Even if financial services are available, they must be adequate to meet the specific needs of these entrepreneurs to ensure business growth and sustainability (Klapper et al., 2021). Financial adequacy is crucial because it directly impacts the ability of women-led businesses to operate effectively, innovate, and expand.

Women entrepreneurs often face challenges in achieving financial adequacy. One of the primary issues is the limited access to sufficient capital, which hampers their ability to invest in their businesses (O'Donnell et al., 2021). Additionally, the terms and conditions of financial products, such as high interest rates and stringent repayment terms, can make it difficult for women entrepreneurs to secure adequate financing (Demirgüç-Kunt et al., 2021).

Several factors influence the financial adequacy of women entrepreneurs. The availability of tailored financial products that meet the specific needs of women-led businesses is critical (World Bank, 2022). For instance, microfinance programs that offer small loans with flexible repayment terms can be more adequate for women entrepreneurs than traditional bank loans (Morduch & Haley, 2021). Furthermore, the cost of financial services, including interest rates and fees, significantly affects the adequacy of financial resources (Klapper et al., 2021).

Concept of Innovation and Wealth Generation

Innovation and wealth generation are pivotal to the business growth and sustainability of women entrepreneurs. Innovation, defined as the creation and implementation of new products, services, or processes, plays a crucial role in enhancing business competitiveness and market positioning. On the other hand, wealth generation is the process of creating economic value that leads to financial gains, ensuring the long-term sustainability of the enterprise. Together, these components are integral to business success, as they allow entrepreneurs to not only survive in competitive markets but also contribute meaningfully to economic growth and development (Klapper et al., 2021).

For women entrepreneurs, particularly in developing economies like Nigeria, innovation is essential for overcoming market constraints and differentiating their businesses from competitors. Financial accessibility acts as a key enabler of innovation by providing the necessary resources for research and development (R&D), technology adoption, and the introduction of new business models (Akhter & Alam, 2022). Entrepreneurs with access to adequate financial resources are more likely to invest in R&D, leading to the creation of innovative products and services that meet the changing needs of the market (Oluwole & Agboola, 2022).

Wealth generation, which is closely linked to innovation, is another critical outcome of financial accessibility. Adequate financial resources enable women entrepreneurs to invest in business expansion, diversify revenue streams, and enhance profitability. Entrepreneurs who have access to financial capital are better positioned to explore new business opportunities, enter new markets, and secure larger contracts (Mustafa & Abdullahi, 2021). Financial accessibility not only fosters innovation

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but also promotes wealth generation by providing the capital necessary for scaling business operations and sustaining long-term growth.

Women Entrepreneurs

The growth of women entrepreneurs refers to the enhancement of business performance and the expansion of business activities by women-owned enterprises. This growth is not only pivotal for the individual success of women entrepreneurs but also for broader economic development, job creation, poverty reduction, and social advancement. In recent years, the role of women entrepreneurs has gained increasing attention, particularly in developing economies, where they significantly contribute to employment, income generation, and innovation. Research shows that women's entrepreneurial growth positively impacts local economies by fostering innovation and creating jobs, particularly in regions where economic opportunities are scarce (Abdullahi et al., 2022). Women-owned businesses often reinvest their earnings into their communities, supporting social infrastructure, education, and healthcare, which further accelerates socio-economic development (Adebayo & Ogunleye, 2023). For example, studies in sub-Saharan Africa have revealed that women entrepreneurs reinvest 90% of their earnings into their families and communities, compared to men who reinvest only 40% (World Bank, 2022).

In terms of economic development, women's entrepreneurial activities are integral to reducing poverty and addressing inequality. In Nigeria, women entrepreneurs account for approximately 41% of micro, small, and medium-sized enterprises (MSMEs), contributing significantly to the economy's non-oil sector (Agunbiade & Lawal, 2021). These women-led businesses are key drivers of innovation and have been found to be more likely to introduce new products or services when provided with adequate financial resources (Musa & Olayinka, 2022). Innovation is essential for maintaining competitiveness and ensuring business survival in the face of market challenges, especially in regions where access to financial resources is limited.

Theoretical Framework

Innovation Diffusion Theory

The Innovation Diffusion Theory, introduced by Everett Rogers in 1962, provides a framework for understanding how new ideas, products, or processes spread within a community or society. This theory explains how innovation is communicated over time through various channels among members of a social system, leading to its adoption. In the context of women entrepreneurs, the theory emphasizes that access to financial resources is critical in enabling the adoption of new technologies and innovations, which in turn drive improved business outcomes and growth.

In the case of women entrepreneurs, financial adequacy plays a pivotal role in determining their ability to adopt innovations. According to Rogers' theory, adequate access to financial resources allows women to invest in new technologies, products, or processes, thereby enhancing their business operations and competitive edge (Rogers, 1962). For example, access to capital enables entrepreneurs to integrate digital technologies into their businesses, improving operational efficiency, reaching new markets, and fostering innovation (Demirgüç-Kunt et al., 2021). Financial inclusion initiatives, such as microloans and digital financial services, are vital in providing women entrepreneurs with the necessary capital to adopt new innovations.

However, women entrepreneurs face several challenges in adopting innovations, particularly when it comes to securing financial resources. Limited access to capital, high-interest rates, and stringent repayment terms are significant barriers that prevent many women from investing in new technologies or improving their business processes (Howell & Nanda, 2019). These financial constraints disproportionately affect women entrepreneurs, especially in developing regions, where traditional financial institutions often exclude them from formal access to cash flow opportunities. As a result,

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women are frequently forced to rely on informal financial sources, which offer limited capital and less security.

Empirical Review

Li, Yu, and Zhang (2023) examined the relationship between financial adequacy and digital innovation in female-led SMEs in China. The study employed a quantitative approach using structural equation modeling (SEM) on survey data from over 300 female entrepreneurs. The findings revealed that when women entrepreneurs perceive their financial resources as adequate, they are more likely to adopt digital tools, engage in e-commerce, and innovate business models. Financial adequacy was also positively associated with investments in new technology and marketing channels. Despite its strengths, the study largely focused on urban SMEs, potentially neglecting the financial struggles and digital limitations faced by rural or informal businesses. Moreover, the research assumed that perceived financial adequacy directly translates into innovation, without accounting for intermediary variables such as digital literacy or infrastructure.

Akinbinu and Odeyemi (2022) examined the role of strategic planning in driving innovation among women-owned businesses in East Africa. Utilizing a cross-sectional survey design, they gathered data from 240 women entrepreneurs operating in Kenya, Uganda, and Tanzania. Their quantitative analysis, based on regression techniques, revealed a strong positive correlation between formal strategic planning and innovation outputs, such as product development and process improvements. The study highlighted that women entrepreneurs who engaged in regular planning activities were better positioned to identify market opportunities and adapt to environmental changes. However, the study relied heavily on self-reported data, which can be subject to social desirability bias. Additionally, while the findings were robust in linking planning to innovation, the research did not account for structural barriers such as limited financial access or institutional support that often shape the planning capacity of women entrepreneurs in these contexts.

Mensah and Amoako (2021) conducted an empirical study on the relationship between access to finance and innovation in women-owned enterprises in Ghana. Using a sample of 210 women entrepreneurs and applying multiple regression analysis, they found a strong positive relationship between financial access and innovation outcomes, particularly in product development and service delivery. The study emphasized that access to credit enabled experimentation, investment in tools, and expansion into new markets. However, the research acknowledged that formal financial institutions often impose rigid conditions that restrict full participation by women. Additionally, the study did not explore how financial literacy or business planning mediates the relationship between finance and innovation, leaving room for a more integrated analysis of how various financial capabilities interact.

Methodology

This study employs a cross-sectional survey research design utilizing quantitative research methods to investigate the effect of financial adequacy on innovation and wealth generation among women entrepreneurs in North-Central Nigeria. This design enables the collection of empirical data to provide a comprehensive analysis of the influence of financial adequacy dynamics. The quantitative approach is centered on the administration of structured surveys aimed at identifying trends and patterns in innovation and wealth generation particularly from the perspectives of women entrepreneurs. The target population focuses on women entrepreneurs operating the Micro, Small, and Medium Enterprises (MSMEs) across the six states of North-Central Nigeria-Benue, Nasarawa, Kogi, Kwara, Niger, and Plateau as well as the Federal Capital Territory (FCT) Abuja. These women are involved in a range of sectors such as agriculture, retail, manufacturing, and services, which significantly contribute to both local and national economic development. The number of women-owned MSMEs in the North-Central region is 37,690. This subset is the primary population for the study, as it focuses on the effect of financial adequacy on the innovation and wealth generation among women-entrepreneurs. A

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purposive sampling technique was adopted to select participants with a minimum of two years' experience. The study seeks to engage 396 respondents to ensure a diverse and representative sample across asset quality and cash flows using a Taro Yamane formula in breaking down the population. Data collection was conducted through a structured online questionnaire distributed via email and professional platforms such as LinkedIn or google form. The questionnaire is divided into sections covering demographic information, financial adequacy, and innovation and wealth generation metrics. Respondents were required to indicate their level of agreement on a five-point Likert scale ranging from 5 (Strongly Disagree) to 1 (Strongly Agree). Quantitative data was analyzed using descriptive statistics and correlation analysis through SPSS software. Prior to the main survey, a pilot test involving 12 participants was conducted to assess the reliability and clarity of the instrument. Participation in the study is entirely voluntary. Informed consent was obtained from all participants, and strict confidentiality was maintained with all responses anonymized to protect the identities of respondents. Ethical clearance was secured from an accredited institutional review board or ethics committee prior to the commencement of data collection. The population distribution and sample size for each state is broken down by total MSMEs and the proportion of women-owned MSMEs, as shown in Table 1:

Table 1: Total MSMEs and Women-Owned MSMEs Distribution by State and Enterprise Size in North-Central Nigeria

State	Total MSMEs	Micro Enterprises	Small Enterprises	Medium Enterprises	Women-Owned MSMEs (19.6%)	Micro Enterprises (Women-Owned)	Small Enterprises (Women-Owned)	Medium Enterprises (Women-Owned)
Benue	24,330	9,479	13,271	1,580	4,769	1,858	2,601	310
Nasarawa	18,633	7,905	10,163	565	3,652	1,549	1,992	111
Kogi	20,203	7,686	12,078	439	3,960	1,506	2,367	86
Kwara	35,921	10,565	24,752	604	7,041	2,071	4,851	118
Niger	32,402	9,205	22,092	1,105	6,351	1,804	4,330	217
Plateau	29,116	7,764	19,087	2,265	5,707	1,522	3,741	444
FCT Abuja	32,956	10,095	18,408	4,453	6,459	1,979	3,608	873
Total	192,561	62,699	119,851	10,011	37,742	12,289	23,491	1,962

Source: SMEDAN, 2024

Sample Size and Sampling Technique

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The sample size for this study was determined using Taro Yamane's formula, which is appropriate for finite populations and provides a simplified approach to calculating a representative sample size. This method is particularly useful when the population size is known, and a specific level of precision is desired. Taro Yamane's formula ensures that the selected sample accurately reflects the characteristics of the broader population - in this case, women entrepreneurs operating within MSMEs across North-Central Nigeria. Using a confidence level of 95% and a margin of error of 5%, the sample size was derived to balance statistical reliability with practical feasibility. The formula applied is:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = required sample size

N = population size

e = margin of error (0.05)

Inputting into the formula, we have:

$$n = \frac{37,742}{1 + 37,742(0.05)^2}$$

$$n = \frac{37,742}{1 + 37,742(0.0025)}$$

$$n = \frac{37,742}{1 + 94.355} = \frac{37,742}{95.355} = 396$$

$$n = 396$$

Model Specification

Tables and simple percentage was used as technique of analyzing the research questions. The study adopted Pearson Moment correlation analysis to determine the nature of impact while regression technique is used to test the hypotheses. Stated below is the functional regressions model for testing of the research hypotheses:

IWG = f(ASSQ, CASF) (3.1)

The regression equation is linearized in the study objectives as:

$IWG = \beta_0 + \beta_1 ASSQ + \beta_2 CASF + u_t$ (3.2)

Where;

IGW = Innovation and Wealth Generation as a proxy for creativity (Dependent variable).

ASSQ = Asset Quality (Independent variable)

CASF = Cash Flows (Independent variable)

$_{ut}$ = the stochastic error term.

β_0 is a regression constant while $\beta_{1 \text{ and }} \beta_2$ are the coefficients of the independent variables.

To test the significance of the individual explanatory variables and coefficients to determine whether there is an impact of the independent variables on the dependent variable, the p-value outputs from the

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regression analysis was employed. Explicitly, if the calculated p-value is less than the benchmark p-value of 0.05 at a scaled 5 percent level of significance, the independent variable is considered to have a significant impact on the dependent variable, and hence the null hypothesis is rejected.

Data Analysis and Results

Table 2: Responses on Financial Adequacy

Variables	Items	Agreement scale				
		SA Freq. (%)	A Freq. (%)	N Freq. (%)	D Freq. (%)	SD Freq. (%)
Financial Adequacy (FA)	I have access to sufficient financial resources to run my business effectively.	300 (65.4)	49 (10.7)	42 (9.2)	29 (6.3)	39 (8.5)
	The financial support I receive is adequate for expanding my business.	304 (66.2)	49 (10.7)	42 (9.2)	25 (5.4)	39 (8.5)
	I can easily access financial resources for business innovation.	303 (66.0)	49 (10.7)	40 (8.7)	29 (6.3)	38 (8.3)
	The financial institutions I interact with offer flexible loan products.	302 (65.8)	51 (11.1)	44 (9.6)	25 (5.4)	37 (8.1)
	Adequate financial resources have led to an increase in my business performance.	197 (42.9)	72 (15.7)	18 (3.9)	10 (2.2)	162 (35.3)

Source: Researcher's Computation (Field Survey), 2025

A significant proportion of respondents indicated that they have access to sufficient financial resources to run their businesses effectively. Specifically, 300 respondents (65.4%) strongly agreed and 49 (10.7%) agreed with this statement. This suggests a generally positive perception of financial availability for day-to-day operations, although a smaller group, 39 respondents (8.5%), strongly disagreed, highlighting the persistence of financial challenges for a minority of the sample.

Regarding business expansion, a similar trend was observed. A combined 353 respondents (76.9%) agreed or strongly agreed that the financial support they receive is adequate for growth, while 8.5% strongly disagreed. This demonstrates that, for many women, financial support is not only available but also seen as enabling enterprise development. This is further supported by the third item, where 66% of respondents strongly agreed and 10.7% agreed that they can easily access financial resources for business innovation, showing that innovation funding is relatively attainable for a majority of the respondents.

In addition, a substantial number of respondents, 302 (65.8%) strongly agreeing and 51 (11.1%) agreeing, reported that financial institutions they engage with offer flexible loan products. This indicates progress in terms of product accessibility and the responsiveness of financial institutions to the needs of small business owners, although 8.1% still strongly disagreed, suggesting gaps in inclusivity or regional disparities in loan structures.

However, the most divergent response pattern appears in the final item, which assessed whether financial adequacy has directly translated into improved business performance. While 197 respondents (42.9%) strongly agreed and 72 (15.7%) agreed, a relatively large portion, 162 (35.3%), strongly disagreed. This suggests that while financial resources may be available and even flexible, they do not

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always guarantee improved performance. This disconnect may stem from factors such as ineffective financial management, limited capacity for scale, market constraints, or misalignment between funding type and business needs.

Table 3: Responses on Innovation and Wealth Generation

Variables	Items	Agreement scale				
		SA Freq. (%)	A Freq. (%)	N Freq. (%)	D Freq. (%)	SD Freq. (%)
Innovation and Wealth Generation (IWG)	I frequently adopt new methods or ideas in my business operations.	268 (58.4)	101 (22.0)	41 (8.9)	25 (5.4)	24 (5.2)
	My business regularly introduces new or improved products or services.	261 (56.9)	96 (20.9)	44 (9.6)	34 (7.4)	24 (5.2)
	I actively seek ways to create additional sources of revenue.	261 (56.9)	95 (20.7)	50 (10.9)	29 (6.3)	24 (5.2)
	I reinvest profits to expand or diversify my business activities.	265 (57.7)	97 (21.1)	49 (10.7)	25 (5.4)	23 (5.0)
	I am open to experimenting with new business models.	264 (57.5)	94 (20.5)	48 (10.5)	30 (6.5)	23 (5.0)

Source: Researcher's Computation (Field Survey), 2025

The responses reveal strong consensus that financial accessibility has positively influenced innovative behaviour. Specifically, 268 respondents (58.4%) strongly agreed and 101 (22.0%) agreed that they frequently adopt new methods or ideas in their business operations. This indicates that a significant majority of women entrepreneurs view financial access as a catalyst for creativity and operational improvement, enabling them to adapt more readily to market demands and changing industry trends.

Similarly, 261 respondents (56.9%) strongly agreed and 96 (20.9%) agreed that their businesses regularly introduce new or improved products or services. This suggests that financial support has not only enhanced the stability of existing operations but has also allowed for continuous innovation, a key driver of long-term competitiveness. However, 34 respondents (7.4%) disagreed, pointing to possible limitations in product development, potentially due to financial misalignment or limited access to market intelligence.

In terms of wealth generation strategies, 261 respondents (56.9%) strongly agreed and 95 (20.7%) agreed that they actively seek additional sources of revenue. This response pattern reflects a growth-oriented mindset, where women leverage financial resources not just to maintain their businesses but to explore new income-generating opportunities. Only 6.3% disagreed, reinforcing the widespread entrepreneurial drive among the participants.

Reinvestment of profits—another indicator of long-term financial planning—was also positively reported. A total of 265 respondents (57.7%) strongly agreed and 97 (21.1%) agreed that they reinvest profits to expand or diversify their business activities. This behaviour underscores a commitment to growth and sustainability, where women use financial gains to build resilience and broaden their economic footprint. A small proportion (5.4%) disagreed, which may reflect operational costs outpacing profits or risk aversion.

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Finally, openness to experimenting with new business models was affirmed by 264 respondents (57.5%) who strongly agreed and 94 (20.5%) who agreed. This highlights a strong entrepreneurial culture marked by adaptability and willingness to explore alternative pathways to success. With only 6.5% disagreeing, it is clear that most women entrepreneurs in the region are actively seeking innovative strategies to enhance their business performance and market relevance.

Table 4: Summary Statistics

	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs.
IWG	4.033551	0.828956	-0.51323	3.048192	20.19482	0.000041	459
ASSQ	4.563399	0.903300	-0.52266	2.876682	21.18823	0.000025	459
CASF	3.950980	0.781398	-0.56555	3.001881	24.46815	0.000005	459

Source: Researcher's Computation (2025)

Innovation and Wealth Generation (IWG) recorded a mean of 4.034, reflecting strong agreement among respondents that financial accessibility enhances their ability to innovate and generate wealth. The standard deviation of 0.829 suggests a fairly wide spread of responses, while the skewness of -0.513 again indicates a left-skewed distribution, with more respondents reporting higher levels of innovation and revenue generation. The kurtosis of 3.05 is nearly normal, showing a standard concentration of data points. The Jarque-Bera value of 20.19 and p-value of 0.000041 indicate significant, meaning that the data is not normally distributed.

Asset Quality (ASSQ) variable recorded the highest mean of 4.563, indicating a strong agreement among respondents that they have viable, well-structured innovation that guide their operations and help in securing financial resources. The standard deviation of 0.903 suggests a moderate spread of responses around the mean, reflecting some variability in the quality or effectiveness of asset quality across participants. The skewness value of -0.522 indicates a slight leftward skew, meaning a larger number of respondents rated this construct highly. The kurtosis of 2.87 is close to the normal distribution value of 3, indicating a fairly normal distribution. The Jarque-Bera (JB) test statistic of 21.19 with a p-value of 0.000025 confirms that the data is not normally distributed, possibly due to the strong clustering of high scores, which aligns with previous findings highlighting the high prevalence of structured planning among the women entrepreneurs surveyed.

Cash Flows (CASF) had a mean of 3.951, indicating a generally positive perception among respondents regarding the role of financial adequacy on how entrepreneurs allow cash to pass one from innovation to the other and wealth improvement. The standard deviation of 0.781 shows moderate variability in the responses. The negative skewness of -0.566 suggests that most respondents agreed or strongly agreed with the statements, consistent with earlier survey findings that highlighted active investment in the cash flows of the entrepreneurs. The kurtosis of 3.00 is almost perfectly aligned with a normal distribution, indicating a balanced spread of responses. However, the Jarque-Bera statistic of 24.47 and p-value of 0.000005 suggest a statistically significant, conforming non-normality of the data.

Correlation and Multicollinearity

Correlation analysis and multicollinearity diagnostics are essential components of regression modelling, especially when examining the relationships between multiple independent variables and a dependent variable. Correlation analysis helps determine the strength and direction of linear relationships between variables, while Variance Inflation Factor (VIF) is used to assess multicollinearity, the degree to which independent variables are linearly related to one another.

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Pairwise correlation Result and Multicollinearity Results for IWG Model

Table 5. presents the correlation and multicollinearity results for the dependent variable: Innovation and Wealth Generation (IWG). This construct reflects the extent to which women entrepreneurs are able to innovate, diversify income streams, and accumulate wealth—core indicators of sustainable business growth. This analysis examines the relationships between IWG and the independent variables: Financial Adequacy (FA), asset quality and cash flow using pairwise correlation coefficients and the Variance Inflation Factor (VIF) to evaluate potential multicollinearity.

Table 5: Pairwise correlation Result and Multicollinearity Results for IWG

	IWG	VBP	FA	FI	
IWG	1 -----				**Centered VIF**
	0.0000	-----			
ASSQ	0.5446	0.1911	1		1.064452
	0.0000	0.0980	-----		
CASF	0.5250	0.1787	0.1867	1	1.059418
	0.0000	0.0901	0.0910	-----	

Source: Researcher's Computation (2025)

Asset Quality (ASSQ) shows a strong, positive correlation with IWG, with a coefficient of 0.5446 and a p-value of 0.0000. This finding reinforces earlier discussions that women entrepreneurs who develop clear and strategic innovation and wealth generation are more likely to engage in innovative practices and achieve higher financial returns. A well-structured business plan can serve as a roadmap for introducing new products, exploring new markets, and reinvesting profits, key activities that drive innovation and wealth creation.

Cash Flows (CASF) shows a moderately strong positive correlation with IWG, with a coefficient of 0.5250 and a p-value of 0.0000. This relationship suggests that access to sufficient cash flows enables women to experiment with new ideas, invest in business expansion, and explore alternative revenue streams. As previously discussed, financial adequacy is not just about survival, it also plays a crucial role in fostering long-term innovation and enterprise diversification.

Regarding the multicollinearity diagnostics, the VIF values for all independent variables are well below the critical threshold of 10: ASSQ (1.064), and CASF (1.059). These low VIF scores confirm the absence of multicollinearity, meaning that the predictors are sufficiently independent of one another and do not distort the regression model. This enhances the interpretability and reliability of subsequent regression coefficients, ensuring that the influence of each independent variable on IWG can be assessed accurately.

Test of Hypotheses

Ordinal Logistic Regression Results

Ordinal logistic regression was employed to examine the relationship between financial adequacy on innovation and wealth generation among women entrepreneurs in North-Central Nigeria. This analytical technique is appropriate for the study because it captures the ordinal nature of the dependent

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variables, Innovation and Wealth Generation (IWG) while assessing the influence of key financial adequacy indicators: Asset Quality (ASSQ), and Cash Flows (CASF).

To further assess the influence of financial adequacy on Innovation and Wealth Generation (IWG) among women entrepreneurs in North-Central Nigeria, three additional hypotheses were tested using the z-statistics and p-values derived from the Ordinal Logistic Regression (OLR) estimates for the IWG model. As with the previous model, the hypotheses were evaluated at the 5% level of significance (α=0.05), using the decision rule that a p-value less than 0.05 indicates a statistically significant effect, warranting the rejection of the null hypothesis.

Table 6: Ordinal Regression Parameter Estimate

Method: ML - Ordered Logit (Newton-Raphson / Marquardt steps)

Dependent Variable: IWG

Variable	Coefficient	Odd Ratios	Std. Error	z-Statistic	Prob.
ASSQ	0.1463	1.1576	0.0480	3.0456	0.0023
CASF	0.0881	1.0921	0.0369	2.3843	0.0166
Reliability Estimates					
Pseudo R-squared	0.7823				
LR statistic	90.6574				
Prob(LR statistic)	0.0000				

Source: Researcher's Computation (2025)

Asset Quality (ASSQ) shows a significant impact on IWG, with a coefficient of 0.1463, odds ratio of 1.1576, z-statistic of 3.0456, and a p-value of 0.0023. This implies that adequate access to financial resources (asset quality) increases the odds of achieving higher levels of innovation and wealth generation by 15.76%. The result emphasizes that when women entrepreneurs have sufficient funding, whether for operations, expansion, or investment in technology, they are more likely to innovate and grow their income base. This finding complements earlier observations that asset quality not only supports business survival but also drives entrepreneurial creativity and long-term wealth accumulation.

Cash Flow (CASF), though with a slightly smaller magnitude, also exhibits a statistically significant influence. With a coefficient of 0.0881, an odds ratio of 1.0921, z-statistic of 2.3843, and a p-value of 0.0166, the results indicate that improved approach to cash flow—such as movement of credit or incomes, which raises the likelihood of enhanced innovation and wealth generation by 9.21%. This supports previous findings that financial adequacy, even when not directly tied to large capital injections, facilitates easier movement to tools and systems that empower women to make smarter, more forward-thinking business decisions.

The Pseudo R-squared value of 0.7823 is notably high, indicating that approximately 78.2% of the variation in IWG is explained by the model. This high Pseudo R-squared suggests that the model provides a well-fitting representation of the data and that the independent variables effectively capture the critical drivers of innovation and wealth creation in women-led enterprises.

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The Likelihood Ratio (LR) statistic of 90.6574, paired with a Prob (LR statistic) of 0.0000, also indicates that the model is statistically significant. The LR test evaluates whether the inclusion of the predictor variables meaningfully improves the model compared to a null model (one with no predictors). This confirms that the effects observed, namely, the positive contributions of financial adequacy (asset quality and cash flow) are statistically valid.

Discussion of Findings

The study revealed that Financial Adequacy (asset quality and cash flow) has a positive and statistically significant effect on innovation and wealth generation. This means that when women entrepreneurs have sufficient financial resources, beyond the bare minimum needed for survival, they are more likely to take calculated risks, innovate processes or offerings, and expand into new markets. Financial adequacy provides the capital buffer that encourages creativity and growth-oriented behaviour, enabling entrepreneurs to move from subsistence-level trading to more sophisticated, wealth-generating business models. This result aligns with the findings of Mensah and Amoako (2021), who found that financial sufficiency is one of the most critical enablers of innovation among women-owned micro and small enterprises in Ghana. In a similar vein, Li, Yu, and Zhang (2023) observed that Chinese women entrepreneurs with adequate funding were more likely to adopt digital innovations, develop brand identities, and increase operational scale, factors directly linked to revenue growth. This study, highlighted the importance of not just accessing finance, but having enough of it to make strategic investments that drive innovation and long-term wealth creation.

Conclusion and Recommendations

Based on the findings and extensive analysis conducted in this study, it is evident that financial adequacy plays a fundamental role in influencing the innovation and wealth generation among women entrepreneurs in North-Central Nigeria. In conclusion, the study showed that financial adequacy indeed has a significant impact of on IWG of women entrepreneurs in north central Nigeria; and therefore, enhancing financial adequacy for women entrepreneurs is not simply a matter of providing asset to quality but involves fostering an ecosystem where planning, adequacy of resources, and cash flow intersect to support long-term innovation is necessary. For policies and interventions to be effective, they must address these dimensions holistically, promoting both the economic and social empowerment of women entrepreneurs. To this extent, the study recommends that since it showed that financial adequacy promotes innovation and wealth generation, the Central Bank of Nigeria (CBN) and commercial banks should keep on designing innovation-linked financial products that offer larger asset quality and cash flow to women who demonstrate investment in business innovation, such as acquiring technology, hiring skilled workers, or entering new markets. These financial products should also provide flexible repayment terms and financial advisory support to ensure funds are used effectively.

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