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Lean Marketing Adoption and Entrepreneurial Performance among Women-Owned SMEs in Abuja, Nigeria: The Mediating Role of Marketing Capabilities

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Abstract

Women-owned small and medium enterprises (SMEs) are the backbone of the Nigerian enterprise economy; however, resource constraints limit the extent to which their marketing efforts translate into performance. Lean marketing focuses on customer value, waste minimisation and ongoing improvement and could provide a resource-efficient route, but it has not been examined in this context. This study investigated the role of marketing capabilities in the relationship between lean marketing adoption and entrepreneurial performance of women-owned SMEs in Abuja, Nigeria. Based on the Resource-Based View and Dynamic Capabilities Theory, a cross-sectional survey was conducted among owner-managers of women-owned retail and service SMEs that have operated for at least two years, using purposive and snowball sampling. Of 400 questionnaires distributed, 238 usable responses were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The measurement model was reliable and valid. Lean marketing adoption was positively associated with marketing capabilities ($\beta = 0.612$, $p < 0.001$) and entrepreneurial performance ($\beta = 0.224$, $p = 0.002$), while marketing capabilities were positively associated with entrepreneurial performance ($\beta = 0.510$, $p < 0.001$). The indirect effect was significant ($\beta = 0.312$, 95% CI [0.179, 0.445]), indicating complementary partial mediation; separately, the model explained 45.0% of the variance in entrepreneurial performance. The findings are consistent with marketing capabilities partially transmitting the link between lean marketing and entrepreneurial performance. Lean marketing training can thus be combined with marketing capability development for women entrepreneurs in resource-constrained environments by support agencies and policymakers.

Keywords: Lean Marketing, Marketing Capabilities, Entrepreneurial Performance, Women-Owned Smes, PLS-SEM, Nigeria.

Introduction

Micro, small and medium enterprises (MSMEs) form the backbone of the Nigerian economy as they make up 96.7% of businesses and contribute 46.31% of gross domestic product (GDP) (SMEDAN & NBS, 2021). PwC Nigeria's (2024) national MSME survey further reports that women own about one-third of MSMEs (32.9%) and that inadequate access to finance and poor electricity are the most cited constraints on growth. African women entrepreneurs work in institutional and social environments that influence their resources and the strategies they use to address resource scarcity (Ojong et al., 2021). Such firms favour marketing approaches that are easy to test, quick to adjust and anchored in customer value. However, the association between such practices and performance has not been tested among women-owned businesses, and the pathway through which any such association operates is not well understood.

Lean marketing is the application of lean thinking, which is the removal of waste, continuous improvement and creation of customer value, to marketing decisions. It is based on the lean startup approach, which involves making assumptions about customers and testing them against evidence, and then making rapid changes as necessary (Shepherd & Gruber, 2020). Lean startup capability has been found to have a positive impact on the performance of the ventures (Harms & Schwery, 2020), and lean startup strategy is associated with sustainable performance by means of iterative learning of the organisation (Zhuge et al., 2023). In marketing scholarship, the related construct of marketing agility captures rapid, evidence-based iteration of marketing decisions (Kalaignanam et al., 2021). The concept of lean entrepreneurship has been widely discussed in Nigeria, but not much has been done practically (Ufua et al., 2022).

The implementation of lean practices does not automatically ensure results; firms must transform them into market knowledge, customer relationships, and coherent plans—the domain of marketing capabilities (Vorhies & Morgan, 2005). In Thailand, Slovenia and Indonesia, studies indicate that marketing capabilities have an impact on strategic orientations and performance (Bodlaj & Čater, 2022; Lekmat et al., 2018; Rois et al., 2025), but they do not start from lean marketing or focus on women-owned businesses. The study contributes by testing marketing capabilities as a mediating pathway, by extending lean-practice research from start-ups to established women-owned SMEs, and by offering evidence from Abuja.

Statement of the Problem

Nigeria's women-owned SMEs face ongoing resource challenges, such as limited access to funding, a lack of infrastructure, and limited marketing budgets (PwC Nigeria, 2024). However, it is not known whether lean marketing is associated with the performance of women-owned SMEs in Abuja, or whether marketing capabilities provide a resource-efficient pathway for that association. Marketing research increasingly treats rapid, evidence-based iteration of marketing decisions as a distinct and measurable

organisational practice, conceptualised as marketing agility (Gomes et al., 2020; Kalaignanam et al., 2021) and measured empirically among exporters (Asseraf et al., 2019), yet its lean, waste-reducing variant has rarely been measured in operating SMEs. The evidence for lean practice is predominantly from start-ups and conceptual research, while the evidence for capabilities as a mediator starts from other strategic orientations, and research on Nigerian women entrepreneurs rarely test for mediation mechanisms (Ojeleye & Mustapha, 2024; Shamaki et al., 2022). Support agencies therefore lack evidence on whether lean marketing alone is sufficient or whether capability building is also required. If there is no evidence, women entrepreneurs may end up trying to use practices that are not going to lead to growth. This study attempts to fill this gap by examining the direct association between lean marketing adoption and entrepreneurial performance and the mediating role of marketing capabilities among women-owned SMEs in Abuja.

Aim and Objectives of the Study

The aim of this study is to examine the relationship between lean marketing adoption and entrepreneurial performance among women entrepreneurs in Abuja, Nigeria, with marketing capabilities as the mediating variable. The objectives are to:

- examine the relationship between lean marketing adoption and entrepreneurial performance;
- examine the relationship between lean marketing adoption and marketing capabilities;
- examine the relationship between marketing capabilities and entrepreneurial performance; and
- determine the extent to which marketing capabilities mediate the relationship between lean marketing adoption and entrepreneurial performance.

Research Questions

- What is the relationship between lean marketing adoption and entrepreneurial performance among women-owned SMEs in Abuja?
- What is the relationship between lean marketing adoption and marketing capabilities?
- What is the relationship between marketing capabilities and entrepreneurial performance?
- To what extent do marketing capabilities mediate the relationship between lean marketing adoption and entrepreneurial performance?

Research Hypotheses

Each null hypothesis corresponds, in order, to one objective and one research question.

Ho1: Lean marketing adoption has no significant relationship with entrepreneurial performance among women-owned SMEs in Abuja, Nigeria.

Ho2: Lean marketing adoption has no significant relationship with marketing capabilities.

H03: Marketing capabilities have no significant relationship with entrepreneurial performance.

H04: Marketing capabilities do not significantly mediate the relationship between lean marketing adoption and entrepreneurial performance.

The directional alternatives are in line with the Resource-Based View and Dynamic Capabilities Theory (Section 2.2): HA1: Lean marketing adoption is positively related to entrepreneurial performance; HA2: Lean marketing adoption is positively related to marketing capabilities; HA3: Marketing capabilities are positively related to entrepreneurial performance; HA4: Marketing capabilities positively mediate the relationship between lean marketing adoption and entrepreneurial performance.

Literature Review

Conceptual Review

Lean Marketing Adoption

Lean marketing focuses marketing efforts on customer value activities, eliminates non-value adding activity, and improves practice through feedback. It is based on the lean startup literature, which views entrepreneurship as an iterative process of testing assumptions (Shepherd & Gruber, 2020). Harms and Schwery (2020) operationalise the use of lean startup as a capability that relies on customer insight, hypothesis testing, experimentation, validation and learning, and lean approaches have been used in digital business model innovation (Ghezzi & Cavallo, 2020). Marketing agility, the closest related construct in marketing scholarship, describes how quickly a firm moves back and forth between making sense of the market and acting on marketing decisions (Kalaignanam et al., 2021); lean marketing is similar but explicitly focuses on eliminating non-value-adding marketing activity. Here, lean marketing adoption is the extent to which a firm organises its marketing around customer value, waste elimination and continuous improvement, measured with 12 items developed for this study (Section 3.3; Table 2). The construct is not the same as digital marketing, which refers to channels, but not a management logic, nor is it the same as low-cost marketing, which focuses on cost minimisation instead of value creation.

Marketing Capabilities

Marketing capabilities are the processes by which a firm uses its knowledge and resources to perform marketing related activities, separate from marketing activities and resources (Vorhies & Morgan, 2005). Static marketing capabilities are directly, and dynamic marketing capabilities indirectly, related to the international performance of SMEs (Reimann et al., 2023). They are conceptualised as market sensing, customer relationship management and marketing planning in this study. To prevent construct overlap, lean marketing is characterised by behavioural routines (targeting customer value, eliminating non-value-adding marketing activity, and iterative testing and adjustment), while

marketing capabilities are characterised by integrative processes (market sensing, customer relationship management and marketing planning). The lean item on customer value asks whether marketing effort is focused on customer value; the capability item on customer knowledge asks whether the firm has the process to acquire and utilise customer knowledge. Since the three dimensions were theorised as reflecting a single process as opposed to being independent (Vorhies & Morgan, 2005), the 11 items were modelled as one reflective construct (Table 6), and therefore dimension-level effects were not estimated, a limitation acknowledged in Section 8.0.

Entrepreneurial Performance

Entrepreneurial performance is the ability of a business to meet its growth and profit targets. Since audited accounts were not available for small firms, five perceptual items covering sales growth, profitability, customer growth and achievement of business objectives were rated against major competitors over the past three years; items were adapted from Adetayo and Ariyo (2023). Perceptual measures can be used without financial records but are subject to response bias, which is discussed in Section 8.0. Because firms became eligible after two years of operation, firm age was retained as a control variable; it was not significantly correlated with entrepreneurial performance ($r = 0.098$; Table 5).

Women-Owned SMEs in Nigeria

A women-owned SME is defined as a business in which a woman owns at least 51% of the enterprise and exercises primary managerial control. Nigerian evidence suggests capability-based routes around the operating constraints these firms experience: digital financial literacy enhances performance (Ojeleye & Mustapha, 2024), social media reduces gender-related operating constraints (Etim, 2020), and, in Abuja, using and adapting digital technology rather than merely being aware of it improves customer satisfaction (Shamaki et al., 2022). Practices only provide value when firms are able to apply them, as tested here.

Theoretical Framework

The study is based on the Resource Based View (RBV) and Dynamic Capabilities Theory.

The RBV suggests that sustainable advantage comes from resources that are valuable, rare and hard to imitate or substitute (Barney, 1991) and subsequent research considers it as an explanation of value creation (Barney et al., 2021). The main assumption in this context is that having a resource is not sufficient; the firm needs to use it. Lean marketing is a managerial resource, a set of routines focused on customer value and waste reduction, and marketing capabilities put it into action. When money is limited, capabilities that are embedded in routines and tacit knowledge are readily available sources of advantage. The RBV thus suggests that capabilities enhance performance (H03) and pass on some of the impact of lean marketing (H04).

The RBV does not provide much detail on the development of capabilities. Dynamic Capabilities Theory deals with this by focusing on how a firm can sense, seize and transform

competencies (Teece et al., 1997) or sensing, seizing and transforming (Teece, 2018). Lean routines are viewed as a managerial practice (a set of observable marketing routines), and marketing capabilities are the capability that integrates and deploys the routines (Vorhies & Morgan, 2005). Lean marketing provides the sensing inputs (customer feedback, low-cost tests and adjustments) while marketing capabilities are the processes within the organisation that transform inputs into market sensing, customer relationship management and marketing planning. Repeated lean practices should build these capabilities over time (H02). Theories suggest a linkage from lean marketing to capabilities to performance. Full mediation is not expected, because lean marketing can also have direct performance benefits (H01). Both theories are expressed at the firm level, not the level of micro and small enterprises owned by women; hence, the application of these theories here is exploratory in terms of gender. The study is not based on a gender-specific theory, but rather it investigates whether the theorised practice–capability–performance chain is valid for a sample of women-owned SMEs, and gender-specific inferences are tempered accordingly (Section 8.0).

Empirical Review

Three strands of evidence emerge from the literature. Harms and Schwery (2020) reported a strong and robust relationship between lean startup capability and start-up performance, and Zhuge et al. (2023) investigated the relationship between lean startup strategy and sustainable performance in 325 Chinese technology start-ups, which showed that lean startup strategy is beneficial to sustainable performance by iterative learning. Both involve start-up or tech companies, and the mediator is learning, not marketing ability.

In the marketing discipline, iterative and evidence-based decision making has been investigated as marketing agility. Kalaignanam et al. (2021) define it as quick cycles of market sensing and marketing execution, Gomes et al. (2020) expand it to international markets, and Asseraf et al. (2019), who surveyed 195 Israeli exporters, found that international marketing agility is directly and indirectly linked to international performance via new product advantage. These studies show that iterative marketing is a distinct and measurable practice, but they have focused on firms that are active in international markets and they have not studied the waste-reduction aspect that defines lean marketing.

Lekmat et al. (2018) examined 405 Thai retail, wholesale and service SMEs and concluded that market orientation had a direct impact on performance as well as through marketing capabilities, while entrepreneurial orientation had an indirect effect. Bodlaj and Čater (2022) with 339 exporting SMEs demonstrated that market orientation influenced the export venture performance through its effect on pricing and product development capabilities. In the study of Indonesian SMEs by Susanto et al. (2023), the link between entrepreneurial orientation and performance was mediated by marketing capabilities, while Rois et al. (2025) conducted a survey of 200 batik SME owner-managers in Indonesia and also found that marketing capability mediated the relationship between

entrepreneurial orientation and marketing performance. In the study of 335 Portuguese B2B SMEs, Reimann et al. (2023) concluded that static marketing capabilities were directly related to international performance, while dynamic marketing capabilities were related to it only indirectly via static marketing capabilities. Estimators, outcomes, and contexts vary across studies, but a consistent pattern emerges: capabilities transmit the effects of strategy, and mediation is complete or partial depending on the antecedent. Shamaki et al. (2022) surveyed 113 female owned businesses in Abuja, Ojeleye and Mustapha (2024) tested digital financial literacy among 94 female entrepreneurs in Kaduna State without mediators and Etim (2020) studied 73 female business owners in the south eastern Nigeria. These studies are primarily direct-effect and small sample size. The sample sizes vary between 73 and 405, the outcomes between customer satisfaction and export venture performance, and the estimators between regression and structural equation modelling, making direct comparisons difficult. Mediation is tested from strategic orientations, and lean practice is tested directly or through learning. The main studies are summarised in Table 1.

Table 1: Summary of Selected Empirical Studies

Study	Context and sample	Design	Principal finding
Harms and Schwery (2020)	Start-ups	Cross-sectional survey; scale development	Strong, robust link between lean startup capability and performance
Zhuge et al. (2023)	325 technology new ventures, China	Cross-sectional survey	Lean startup strategy raises sustainable performance through iterative learning
Asseraf et al. (2019)	195 exporters, Israel	Survey; SEM; follow-up interviews	Marketing agility related to international performance directly and through new-product advantage
Lekmat et al. (2018)	405 retail, wholesale and service SMEs, Thailand	Cross-sectional survey; SEM	Market orientation acts directly and through capabilities; entrepreneurial orientation only through capabilities
Bodlaj and Čater (2022)	339 exporting SMEs, Slovenia	Cross-sectional survey	Market orientation acts through pricing and product development capabilities
Susanto et al. (2023)	SMEs, Indonesia	Cross-sectional survey; PLS-SEM	Marketing capabilities mediate the effect of entrepreneurial orientation on performance
Reimann et al. (2023)	335 B2B SMEs, Portugal	Cross-sectional survey; SEM	Static capabilities linked directly to international performance; dynamic capabilities only through static capabilities

Study	Context and sample	Design	Principal finding
Rois et al. (2025)	200 batik SME owner-managers, Indonesia	Cross-sectional survey; SEM	Marketing capability mediates the effect of entrepreneurial orientation on marketing performance
Shamaki et al. (2022)	113 female-owned enterprises, Abuja	Cross-sectional survey; multiple regression	Adopting and adapting technology, not awareness, improves customer satisfaction
Ojeleye and Mustapha (2024)	94 female entrepreneurs, Kaduna State, Nigeria	Cross-sectional survey	Digital financial literacy improves performance; no mediators tested
Etim (2020)	73 female business owners, South-East Nigeria	Cross-sectional survey	Social media use supports the viability of female-owned SMEs

Source: Authors' compilation from the studies cited.

Research Gap

Studies were identified through searches of Google Scholar, Scopus and Web of Science (2015–2025) using the terms 'lean marketing', 'lean startup', 'marketing agility', 'marketing capabilities', 'SME performance' and 'women-owned enterprises', supplemented by backward citation tracking. Of the studies retrieved, those summarised in Table 1 were retained because they reported an empirical test of a practice- or orientation–capability–performance chain. The evidence for lean-practice is sourced from start-up and conceptual studies, while learning is the mediator, and the evidence for capability-mediation is sourced from market and entrepreneurial orientation studies with samples from Asian countries and European countries, and the evidence for Nigerian women-entrepreneur studies rarely test the mechanisms. None of the reviewed studies tests marketing capabilities as a mediator of lean marketing adoption in women-owned SMEs in Abuja; the gap claim is therefore limited to the reviewed studies and does not assert an exhaustive search. This study addresses this gap by testing marketing capabilities as a mediator of lean marketing adoption in women-owned SMEs in Abuja, a context not previously examined.

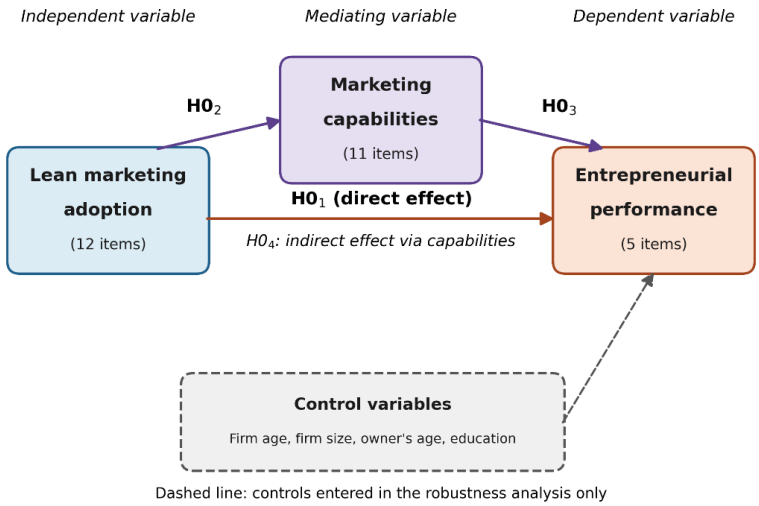
Hypotheses Development and Conceptual Framework

The direct path also reflects the RBV expectation that valuable routines lead to results, and evidence of the link between lean practice and venture performance (Harms & Schwery, 2020; Zhuge et al., 2023); for finance-constrained firms (PwC Nigeria, 2024), redirecting effort to customer value should boost sales and profit before capabilities are developed. The journey towards capabilities is based on the sensing-seizing-transforming logic (Teece, 2018) and the evidence that lean practice creates learning (Zhuge et al., 2023). The path from capability to performance is consistent with the evidence provided by SMEs (Lekmat et al., 2018; Reimann et al., 2023) and mediation is included as both theories situate

capabilities between practice and performance (Bodlaj & Čater, 2022; Susanto et al., 2023). Nigerian evidence that applying practices, rather than merely knowing them, is associated with better outcomes (Shamaki et al., 2022) suggests that the same pathways may operate among women-owned SMEs in Abuja, which this study tests.

The framework is shown in Figure 1. Lean marketing adoption is expected to relate to entrepreneurial performance directly (H01) and indirectly (H02, H03, combined in H04), with marketing capabilities in between. The robustness analysis includes firm age, firm size, entrepreneur's age, and education as control variables.

Figure 1: Conceptual Framework of the Study



Source: Authors' conceptualisation.

Methodology

Research Design

A cross-sectional quantitative survey design was used to test direct and mediated relationships in a single time point and a quantitative approach allows objective measurement and statistical testing of the hypotheses. Because all constructs were measured at one time from one respondent per firm, the design supports associational rather than causal conclusions.

Population, Sampling and Sample Size

The population consisted of women-owned SMEs in the Federal Capital Territory (FCT), Abuja, estimated at approximately 14,624 SMEs (SMEDAN & NBS, 2021). The figure is used as an approximate population benchmark; because no sampling frame was available, it does not support claims of representativeness. The unit of analysis was the enterprise while the key informant was the owner-manager. The size was determined according to the number of employees: micro (less than 10 persons), small (10 to 49) and medium (50 to 199). The study included retail and service SMEs that had been in operation for two or more years.

Majority ownership, managerial control, 2 years of operation and retail/service activity were required for eligibility.

Since there was no sampling frame, owner-managers were selected via purposive sampling and others were selected through snowball sampling. According to the Krejcie and Morgan (1970) table, the number is 375; 400 questionnaires were sent out to accommodate for non-response. The sampling was non-probabilistic; the Krejcie and Morgan (1970) table was used as a benchmark rather than a guarantee of representativeness. The achieved sample of 238 exceeds the minimum required for PLS-SEM by the inverse square root method (Kock & Hadaya, 2018), which, for the smallest structural path in the model ($\beta = 0.224$) at a 5% significance level and 80% power, indicates a minimum of 124 cases.

Instrument and Measurement of Variables

The constructs were measured using a structured questionnaire with marketing capability and performance items adapted from validated questionnaires on five-point Likert scales (1 = strongly disagree, 5 = strongly agree) (Table 2). Sample items are "We continuously look for ways to reduce waste in our marketing efforts" and "We have good knowledge of our customers' needs." The lean marketing items included customer value orientation, waste reduction, and continuous improvement; because no validated lean marketing scale exists for SMEs, the 12 items were generated in three stages: (i) item generation from the lean practice and lean startup literature (Shepherd & Gruber, 2020; Ufua et al., 2022); (ii) expert review by three academics in marketing and entrepreneurship, who reviewed the items for clarity, relevance and domain coverage, leading to the deletion of four redundant items; and (iii) a pilot study with 30 women entrepreneurs outside the main sample (Section 3.6). Capability items were market sensing, customer relationship management, and marketing planning, while the five performance items covered sales growth, profitability, customer growth, and achievement of business objectives, compared to major competitors over three years. Firm age, firm size, entrepreneur's age and education were used as controls.

Table 2: Operationalisation of Study Constructs

Construct	Dimensions (items)	Total items	Source of adaptation
Lean marketing adoption	Customer value orientation (5), waste reduction (4), continuous improvement (3)	12	Developed for this study from lean practice literature (Shepherd & Gruber, 2020; Ufua et al., 2022); content validated by three academic experts and pilot-tested (n = 30)
Marketing capabilities	Market sensing (4), customer relationship management (4), marketing planning (3)	11	Vorhies and Morgan (2005)

Construct	Dimensions (items)	Total items	Source of adaptation
Entrepreneurial performance	Perceived performance relative to competitors	5	Adetayo and Ariyo (2023)

Source: Authors' compilation. Note: The 11 marketing capability items were modelled as a single reflective construct because the three dimensions are theorised as interdependent processes (Vorhies & Morgan, 2005). Lean marketing adoption and marketing capabilities were specified as distinct constructs; discriminant validity is reported in Table 6 (HTMT).

Data Collection

The questionnaires were administered by trained research assistants, adopting a mixed-mode approach: the paper version was given to the owner-managers who were purposively selected, while the electronic (online) version was sent to the respondents recruited by snowball referral. The reported return rates are descriptive of questionnaires distributed and should not be interpreted as population response rates, as the number of owner-managers reached through referrals. Data were collected over eight weeks (January–March 2025). A total of 400 questionnaires were distributed, of which 263 were returned and 238 were suitable for analysis after screening for incomplete and invalid responses.

Data Analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) was conducted using SmartPLS 4.0 (Ringle et al., 2022) because it is appropriate for mediation models and can be used with moderately sized samples that may not be normally distributed (Hair et al., 2019, **2021)**. The measurement model was validated by loadings (≥0.70), Cronbach's alpha and composite reliability (≥0.70), average variance extracted (AVE; ≥0.50), and heterotrait-monotrait ratio (HTMT; below 0.85; Henseler et al., 2015). The structural model was evaluated using path coefficients estimated with bootstrapping (5,000 subsamples, bias-corrected, two-tailed, 5% significance level); 95% confidence intervals were used for all direct and indirect effects. The mediation was tested using the bootstrapped indirect effect and classified based on the classification of Zhao et al. **(2010).** The following diagnostics are presented in Section 4.5a: model fit (standardised root mean square residual, SRMR; < 0.08 indicates good fit), effect size (f^2; 0.02, 0.15 and 0.35 indicate small, medium and large effects, respectively), predictive relevance (PLSpredict; $Q^2 > 0$; Shmueli et al., 2019) and collinearity (structural VIFs; < 3.3; Hair et al., 2019). Furthermore, a robustness model was estimated that added firm age, firm size, entrepreneur's age and education as control variables, and tested the interaction term lean marketing adoption × marketing capabilities on entrepreneurial performance using the two-stage approach in SmartPLS 4.0. Table 9 presents the results for the control variables and the interaction.

Validity, Reliability and Common Method Bias

Three academics in marketing and entrepreneurship reviewed the questionnaire and rated each item on a 4-point scale of relevance (Mean = 3.6) and clarity (Mean = 3.5), and items

with a score below 3 were revised. A pilot study with 30 women entrepreneurs outside the main sample produced Cronbach's alpha values of 0.89 (lean marketing adoption), 0.86 (marketing capabilities) and 0.84 (entrepreneurial performance). Common method bias was addressed at the design stage, where predictor and outcome items were placed in different sections of the questionnaire, respondents were assured of anonymity, and the wording of the items was kept simple and specific. Common method bias was also assessed statistically using the full collinearity test (Kock, 2015) and the results showed that the full collinearity VIFs for lean marketing adoption (1.69), marketing capabilities (2.07) and entrepreneurial performance (1.82) were all below the threshold of 3.3, suggesting that common method bias is not a serious concern. Tolerance statistics revealed no problematic multicollinearity among predictors. Content validation was achieved by expert review and minor revisions were made.

Ethical Considerations

Ethical approval for the study was obtained from the University of Abuja Research Ethics Committee before data collection. Participation was voluntary, informed consent was obtained from every respondent, responses were anonymised, and no identifying firm or personal information was collected. Data were stored securely and used only for the purposes of this study.

Results

Response Rate and Respondent Profile

Of the 400 questionnaires distributed, 263 were returned (65.75%), and 238 were retained for analysis (59.5% of distributed questionnaires). These rates are descriptive only, given snowball recruitment (Section 3.4). Most respondents were aged 31–40 (42.9%) and 41–50 (28.2%), and 58.8% had tertiary qualifications. Micro enterprises accounted for 64.3% of the firms, small enterprises accounted for 35.7%, and no medium enterprises were represented. Firms were spread across age bands: 38.7% had operated for two to five years, 35.3% for six to ten years, and 26.1% for more than ten years.

Table 3: Respondent and Firm Characteristics (N = 238)

Category	Frequency	%
Respondent age		
20–30 years	52	21.8
31–40 years	102	42.9
41–50 years	67	28.2
Above 50 years	17	7.1
Education		
Secondary	79	33.2
Tertiary	140	58.8
Postgraduate	19	8.0

Category	Frequency	%
Firm age		
2–5 years	92	38.7
6–10 years	84	35.3
Above 10 years	62	26.1
Firm size		
Micro (1–9 employees)	153	64.3
Small (10–49 employees)	85	35.7

Source: Field survey.

Descriptive Statistics

Table 4 reveals means above the scale midpoint of 3.00 for lean marketing adoption (3.72), marketing capabilities (3.85), and entrepreneurial performance (3.68), which suggests moderately high lean marketing adoption, reasonably strong marketing capabilities, and satisfactory perceived entrepreneurial performance. The dispersion was moderate, with minimum scores ranging from 1.40 to 1.75 and maximum scores of 5.00, indicating that the data covered firms at very different levels of adoption and performance. The average firm age was 7.42 years (median **7.00)**, and the average number of employees per firm was 8.56 (median 6), indicating a high concentration of micro enterprises.

Table 4: Descriptive Statistics (N = 238)

Variable	Mean	Median	SD	Min.	Max.
Lean marketing adoption (1–5)	3.72	3.75	0.68	1.50	5.00
Marketing capabilities (1–5)	3.85	3.88	0.61	1.75	5.00
Entrepreneurial performance (1–5)	3.68	3.70	0.72	1.40	5.00
Firm age (years)	7.42	7.00	3.86	2.00	18.00
Firm size (employees)	8.56	6.00	7.23	1.00	45.00

Source: Field survey.

Correlation Analysis

Table 5 reveals that lean marketing adoption was significantly related to marketing capabilities (r=0.612) and entrepreneurial performance (r=0.536) (p<0.01) and that marketing capabilities was significantly related to entrepreneurial performance (r=0.647) (p<0.01). Firm age was not correlated with the constructs, and firm size was only weakly correlated with capabilities (r = 0.156) and performance (r = 0.142). There were no signs of multicollinearity as the correlation between constructs was below 0.85.

Table 5: Correlation Matrix (N = 238)

Variable	1	2	3	4	5
1. Lean marketing adoption	1.00				
2. Marketing capabilities	0.612**	1.00			
3. Entrepreneurial performance	0.536**	0.647**	1.00		

Variable	1	2	3	4	5
4. Firm age	0.087	0.112	0.098	1.00	
5. Firm size	0.124	0.156*	0.142*	0.348**	1.00

*Note: *p < 0.05; **p < 0.01 (two-tailed). Correlations among constructs 1–3 are latent variable correlations from SmartPLS 4; correlations involving firm age and firm size are Pearson coefficients.*

Source: *Field survey.*

Measurement Model

Table 6 shows that all loadings exceeded 0.70 (0.712 to 0.891), alpha (0.834 to 0.902) and composite reliability (0.876 to 0.928) exceeded 0.70, and AVE **(0.587** to 0.672) exceeded 0.50, establishing convergent validity. The values of HTMT (0.612 to 0.768) did not exceed 0.85, thus indicating discriminant validity. These statistics indicate that the constructs are measured reliably and are distinct, thus providing confidence in the interpretations of the structural estimates.

Table 6: Reliability, Convergent Validity and Discriminant Validity

Construct	Items	Loadings	Cronbach's α	CR	AVE
Lean marketing adoption	12	0.712–0.891	0.902	0.928	0.672
Marketing capabilities	11	0.724–0.856	0.867	0.896	0.634
Entrepreneurial performance	5	0.731–0.878	0.834	0.876	**0.587**

Note: CR = composite reliability; AVE = average variance extracted. HTMT across construct pairs ranged from 0.612 to 0.768.

Source: *Field survey.*

Structural Model and Hypothesis Testing

The results of the structural model are presented in Table 7 and Figure 2, which accounted for 45.0% of the variance in entrepreneurial performance (R^2 = 0.450) and 37.5% of the variance in marketing capabilities (R^2 = 0.375). Lean marketing adoption was positively associated with entrepreneurial performance (β = 0.224, t = 3.155, p = 0.002; Ho1 rejected, HA1 supported) and marketing capabilities (β = 0.612, t = 9.847, p < 0.001; Ho2 rejected, HA2 supported), and capabilities were positively associated with performance (β = 0.510, t = 6.986, p < 0.001; Ho3 rejected, HA3 supported). None of the confidence intervals contained the value 0. The R^2 value of 0.450 is moderate for PLS-SEM; Hair et al. (2019) treat values between 0.25 and 0.50 as weak to moderate, and capabilities are more strongly related to performance than lean marketing is directly.

Table 7: Structural Model and Hypothesis Testing

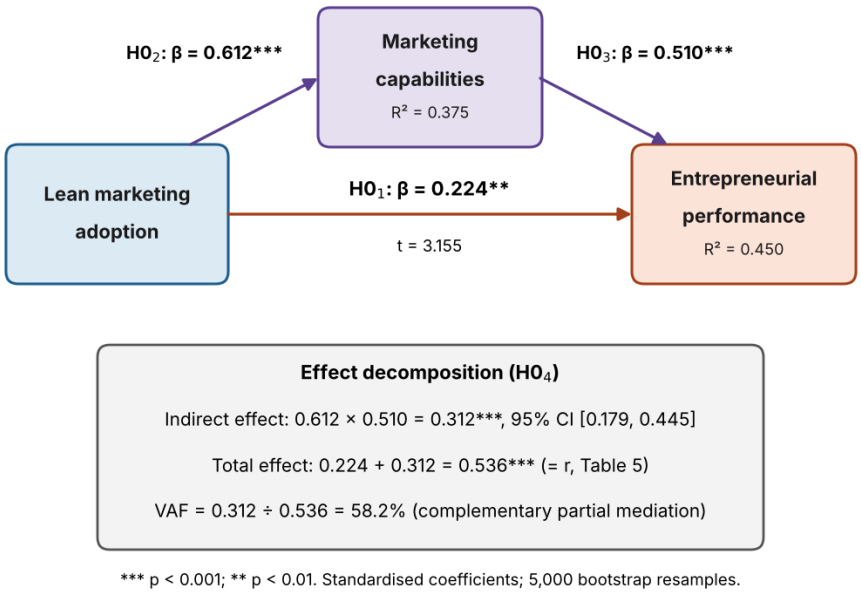
Hypothesis	Path	β	SE	t	p	95% CI	Decision
Ho1	LMA → EP	**0.224**	**0.071**	**3.155**	**0.002**	**[0.085, 0.363]**	Rejected
Ho2	LMA → MC	0.612	0.062	9.847	< 0.001	[0.490, 0.734]	Rejected

Hypothesis	Path	β	SE	t	p	95% CI	Decision
H03	MC → EP	**0.510**	**0.073**	**6.986**	< 0.001	**[0.367, 0.653]**	Rejected

*Note: LMA = lean marketing adoption; MC = marketing capabilities; EP = entrepreneurial performance. R^2 = **0.450** (EP), 0.375 (MC).*

Source: Field survey.

Figure 2: Estimated Structural Model with Standardised Path Coefficients



Source: Field survey.

Model Fit and Predictive Relevance

There was a good fit between the estimated model and the data (SRMR = 0.061). The effect sizes of lean marketing adoption on entrepreneurial performance, marketing capabilities on entrepreneurial performance, and lean marketing adoption on marketing capabilities were small, medium, and large, respectively (f^2 = 0.057, 0.296, and 0.600). PLSpredict results showed predictive relevance for entrepreneurial performance (Q^2 = 0.284; all indicator Q^2 > 0). Structural VIFs were between 1.000 and 1.599, below the cut-off value of 3.3.

Mediation Analysis

Table 8 shows a significant direct effect (β = 0.224) and a significant indirect effect through marketing capabilities (β = 0.312, t = 4.588, p < 0.001; 95% CI [0.179, 0.445]), equal to the product of the constituent paths (0.612 × 0.510). The overall effect is 0.536, equal to the correlation between lean marketing adoption and entrepreneurial performance in Table 5, as required because lean marketing adoption is exogenous. Both effects are important, and they have the same sign, so that capabilities partially mediate the relationship (complementary partial mediation; Zhao et al., 2010), accounting for 58.2% of the total

effect (0.312 ÷ 0.536). H04 is rejected, and HA4 is supported. Mediation is not an artefact of a single path: the constituent path is important as is the product.

Table 8: Mediation Analysis

Effect	Path	β	SE	t	p	95% CI	Conclusion
Direct	LMA → EP	**0.224**	**0.071**	**3.155**	**0.002**	**[0.085, 0.363]**	Significant
Indirect	LMA → MC → EP	**0.312**	**0.068**	**4.588**	< 0.001	**[0.179, 0.445]**	Significant
Total	LMA → EP	**0.536**	**0.060**	**8.933**	< 0.001	**[0.418, 0.654]**	Significant

Note: VAF = indirect ÷ total = ***58.2%****.*

Source: Field survey.

Robustness Checks

The robustness model is reported in Table 9. The four control variables were not significantly related to entrepreneurial performance, and the hypothesised paths remained significant and similar in size to those in Table 7. The interaction term lean marketing adoption × marketing capabilities was not significant, showing that marketing capabilities do not moderate the direct path; this does not, in itself, prove mediation, which is tested with the bootstrapped indirect effect in Table 8.

Table 9: Robustness Model — Control Variables and Interaction Term

Variable	β	p	Conclusion
Firm age → EP	**0.041**	**0.412**	**Not significant**
Firm size → EP	**0.062**	**0.287**	**Not significant**
Entrepreneur's age → EP	**−0.033**	**0.503**	**Not significant**
Education → EP	**0.058**	**0.311**	**Not significant**
LMA × MC → EP (interaction)	**0.048**	**0.276**	**Not significant**

Note: EP = entrepreneurial performance; LMA = lean marketing adoption; MC = marketing capabilities.

Source: Field survey.

Discussion

The findings show that lean marketing adoption is associated with entrepreneurial performance in two ways: directly, and indirectly through marketing capabilities.

The positive direct association (H01) is consistent with evidence linking lean practice to venture outcomes (Harms & Schwery, 2020; Zhuge et al., 2023) and shows that the association also holds among operating retail and service SMEs, which are mostly micro enterprises. One possible explanation is that lean marketing allocates limited marketing budgets to what customers value, which means that efficiency and responsiveness can be achieved without a significant promotional budget, in line with the RBV perspective that valuable routines generate advantage under a limited marketing budget (Barney, 1991). This is an interpretation as marketing expenditure was not measured. The benefit of

marketing-related practice is also aligned with Nigerian evidence of social media influencer marketing (Adetayo & Ariyo, 2023), but the study focused on a different practice and did not include a mediation test.

The path to marketing capabilities (H02) is the least documented. The studies reviewed show a connection between lean strategy and performance through learning (Zhuge et al., 2023) and orientations to performance through capabilities (Lekmat et al., 2018), but not lean practice to capability development. The outcome provides initial cross-sectional evidence of that link and aligns with the Dynamic Capabilities argument that sensing, seizing and transforming routines create capabilities (Teece, 2018). Thus, lean marketing can be seen as a means of developing capability, rather than simply reducing costs.

The direct effect of lean marketing was smaller in magnitude than the direct effect of capabilities, which was the strongest predictor of performance (H03; β = **0.510**), which is in line with the findings of Lekmat et al. (2018), Reimann et al. (2023), Bodlaj and Čater (2022), Rois et al. (2025) and Susanto et al. (2023). In the case of finance-challenged companies, customer knowledge and retention can be a growth that doesn't require external funding.

The mediation result (H04) is core: roughly 58% of the total effect was transmitted via capabilities. The findings for partial mediation are similar to those of Lekmat et al. (2018), who reported that market orientation acted both directly and through marketing capabilities, whereas entrepreneurial orientation acted only indirectly through capabilities; the present study's partial mediation therefore aligns with their market-orientation finding rather than their entrepreneurial-orientation finding. One plausible explanation, not tested here, is that the waste elimination aspect of lean marketing brings about benefits, like reduced marketing costs, without capability building. The non-significant interaction indicates that marketing capabilities do not moderate the direct path; mediation is instead evidenced by the significant bootstrapped indirect effect (Table 8). The results also corroborate the evidence from Abuja that it is not awareness but the adoption and adaptation of practices that improve the performance of female-owned businesses (Shamaki et al., 2022) and extend the direct-effect studies (Ojeleye & Mustapha, 2024) by testing a mediating pathway.

The setting is worthy of comment. Approximately 71% were aged 31 to 50 and approximately two-thirds had tertiary or postgraduate qualifications (Table 3). Lean routines may lead to capabilities here because owner-managers who are educated and very involved in the day-to-day marketing may be better suited to experiment, collect feedback and adjust. Comparisons across education levels might test this conjecture. The results were not affected by adding controls and firm size was only weakly related to capabilities and performance, which is consistent with practice and capabilities, rather than scale, being associated with performance.

In theory, the findings are congruent with the RBV, which is about the importance of capabilities, and Dynamic Capabilities Theory, which is about the process of developing capabilities through lean routines. The study thus positions marketing capabilities as a mediating pathway, and not merely a predictor. The study does not claim to be able to say

which of the capability items has the effect, since they were modelled as one construct. The model accounts for 45.0% of the variance in performance, meaning that 55.0% remains unexplained. Finance, infrastructure and market conditions are plausible candidates for this unexplained variance (PwC Nigeria, 2024), but they were not measured in this study and this attribution remains a conjecture for future research.

An alternative explanation is reverse causality: more capable firms may be more likely to adopt lean practices. Because all constructs were measured at a single time point, the direction of the association cannot be established, and longitudinal or experimental designs are needed to rule out this possibility (Section 8.0).

Lean marketing is a tool for owner-managers to use to increase customer knowledge and build customer relationships and plan discipline, not just reduce cost. Specifically, an owner-manager might start with one customer question, try a small change in offer or channel, observe what customers do, tweak, and incorporate these changes into the routines, like customer follow-up and monthly marketing reviews. For support agencies and policymakers, lean training is likely to be most useful when combined with capability development and with finance and infrastructure support. The three capability dimensions could be used as a diagnostic and as 64.3% of the sample were micro enterprises, materials could be designed assuming limited staff and time.

Conclusion

This study focused on the adoption of lean marketing and entrepreneurial performance of women entrepreneurs in SMEs in Abuja with marketing capabilities as a mediator. The results of the analysis of 238 valid responses using PLS-SEM indicated that the adoption of lean marketing had a positive relationship with entrepreneurial performance ($\beta = 0.224$) and marketing capabilities ($\beta = 0.612$), while marketing capabilities had a positive relationship with entrepreneurial performance ($\beta = 0.510$). The relationship was partially mediated (indirect effect = 0.312, 95% CI [0.179, 0.445]) with 58.2% of the total effect (0.536) transmitted through marketing capabilities, and 45.0% of the variance in performance was explained. All four null hypotheses were rejected, the directional alternatives were supported, and the four objectives and research questions were addressed. The study provides evidence that lean marketing practices are positively associated with performance, partly through marketing capabilities, in an environment that has been little studied; the cross-sectional design does not permit causal conclusions.

Recommendations

1. Owner-managers should adopt lean marketing principles that emphasise customer value, eliminate non-value-adding activities, and continuously improve practice through small experiments. Simple records of customer feedback and resultant changes should be maintained to accumulate learning.

2. Lean marketing training should be complemented with capability development, such as mentoring in customer research and marketing planning, because the indirect path accounts for approximately 58% of the total effect in this sample (Table 8). Capability development is therefore a plausible complementary focus alongside lean adoption. However, the variance share is a descriptive feature of the estimated model and is not an estimate of the impact of any programme; capability indicators should nonetheless be monitored in programme evaluations alongside adoption.
3. Policymakers may consider marketing capability development alongside finance and infrastructure interventions. The unexplained variance in this model (55.0%) is consistent with other constraints operating, but the present design does not identify them; the case for capability interventions rests on the significant capability–performance association reported here, not on the size of the unexplained variance.

Limitations and Future Research

The cross-sectional design limits causal inferences, and reverse causality cannot be ruled out (Section 5.0). Measures were self-reported, and performance was perceptual, making results vulnerable to response and common method bias. The sampling was non-probabilistic (no sampling frame) and the 238 usable responses did not meet the benchmark of 375, therefore no representativeness can be claimed. Firms that had operated for two to three years rated performance over a period shorter than the three-year reference window, although firm age was unrelated to performance (Table 5). The lean marketing scale was developed for this study and requires validation in other samples. Because the theoretical framework is not gender-specific, the findings should not be read as evidence of a gender-specific mechanism. Marketing capabilities were represented as one construct and only micro and small retail and service SMEs in Abuja were sampled, thus not generalisable.

Longitudinal designs could be employed in future research, as could the use of a combination of perceptual measures and objective sales data, as well as the modelling of the capability dimensions separately, and the comparison of micro and small firms or male-owned enterprises, and the study of other mediators (such as digital capabilities) or moderators (such as access to finance).

Data Availability

The anonymised dataset and the SmartPLS output (measurement model, structural model, bootstrapping and robustness analyses) are provided as supplementary files with this article for verification and reanalysis.

Conflicts of Interest

The authors declare no conflicts of interest.

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