

Strengthening Smallholder Agribusiness Competitiveness through Value Chain Management Strategy: Evidence from North Sumatra, Indonesia

Mesra B, Julia Marisa, and Emil Abdilla Amrul

Abstract

The competitiveness of smallholder agribusiness enterprises is strongly determined by managerial capability and by value chain management strategies that adaptively integrate business actors, market information, and market orientation. Prior studies have tended to examine value chain strategy descriptively, without testing the mechanisms through which such strategies are translated into competitive advantage. This study develops and empirically tests a conceptual model linking Value Chain Management Strategy (VCMS) to Agribusiness Competitiveness (AC), with Managerial Capability (MC) as a mediator and Market Orientation (MO) as a moderator. The study employed a quantitative explanatory design using a cross-sectional survey of 182 smallholder sheep-fattening agribusiness actors in Langkat Regency, North Sumatra, selected through multistage stratified random sampling. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings show that VCMS exerted a significant positive direct effect on both MC and AC, that MC partially mediated the effect of VCMS on AC, and that MO significantly and positively moderated the VCMS–AC relationship, strengthening the effect of VCMS on competitiveness among enterprises with higher market orientation. These findings reinforce the dynamic capability perspective within the smallholder agribusiness context and offer practical implications for business actors, facilitating institutions, and policymakers in designing value chain-based competitiveness interventions.

Keywords: *value chain management strategy, managerial capability, market orientation, agribusiness competitiveness, PLS-SEM*

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Introduction

Smallholder agribusiness enterprises supply a substantial share of food and livestock products in developing economies, yet their contribution to household welfare remains persistently constrained by weak competitiveness relative to larger, vertically integrated agribusiness actors [1]. In North Sumatra, Indonesia, smallholder producers dominate numerically across key agricultural commodities, but empirical evidence from the region indicates that a large proportion continue to operate with fragmented market linkages and limited managerial capacity [2]. This phenomenon is not merely a production problem; it reflects a deeper managerial and strategic deficit in how smallholder enterprises organize, coordinate, and position themselves within increasingly demanding and concentrated agribusiness value chains [3].

The competitiveness of smallholder agribusiness has attracted sustained scholarly attention because it sits at the intersection of strategic management and development economics: it determines whether productivity gains at the farm level translate into sustained income and welfare improvements at the household level [4]. Within the strategic management literature, the resource-based view and its dynamic capability extension argue that competitive advantage arises not merely from possessing resources, but from the capability to sense opportunities, reconfigure resources, and adapt strategy to changing market conditions [5][6]. Applied to agribusiness, this perspective suggests that value chain management strategy, defined as the deliberate coordination of sourcing, quality, logistics, and information flows across chain actors, constitutes a strategic resource whose competitive value depends on the managerial capability available to deploy it effectively [7]. Understanding this relationship is therefore central to explaining persistent competitiveness gaps among smallholder producers despite ongoing value chain development interventions.

Despite this theoretical relevance, empirical research on smallholder agribusiness value chains has developed along a largely descriptive trajectory. A substantial body of work maps value chain actors, margins, and structural inefficiencies using accounting-based or qualitative approaches, offering valuable diagnostic insight but limited explanatory power regarding the mechanisms through which strategic choices influence competitive outcomes [8][9]. Where strategic management frameworks have been applied, studies tend to treat value chain strategy and competitiveness as a direct, unmediated relationship, overlooking the possibility that managerial capability functions as a critical translating mechanism between strategy formulation and competitive performance [10]. Furthermore, contingency factors such as market orientation, defined as the degree to which an enterprise systematically generates and responds to market intelligence, have received extensive attention in conventional firm-level marketing research [11], yet remain rarely tested as boundary conditions shaping the strategy–competitiveness relationship within smallholder, resource-constrained agribusiness settings. Methodologically, much of the existing evidence relies on small qualitative samples or single-indicator financial ratios, limiting the ability to test multi-construct relationships with adequate statistical rigor [12].

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These limitations reveal three interrelated gaps. First, there is a paucity of empirical models that explain how value chain management strategy translates into agribusiness competitiveness through an identifiable managerial mechanism, rather than assuming a direct effect. Second, the moderating role of market orientation in strengthening or constraining this translation process remains theoretically plausible but empirically untested in smallholder agribusiness contexts. Third, few studies employ construct-based, multivariate quantitative methods capable of simultaneously estimating direct, mediating, and moderating effects while accounting for measurement error, an approach increasingly regarded as necessary for rigorous theory testing in management research. This study responds directly to these gaps.

Accordingly, this study develops and empirically tests an integrated model in which value chain management strategy is hypothesized to influence agribusiness competitiveness both directly and indirectly through managerial capability, with market orientation moderating the strength of this relationship. Specifically, this study aims to: (1) examine the direct effect of value chain management strategy on agribusiness competitiveness among smallholder producers; (2) examine the effect of value chain management strategy on managerial capability, and the mediating role of managerial capability in the strategy–competitiveness relationship; and (3) examine the moderating role of market orientation in strengthening the effect of value chain management strategy on agribusiness competitiveness. By simultaneously modeling these direct, mediating, and moderating pathways, this study offers a more complete account of the conditions under which value chain strategy generates competitive advantage for smallholder agribusiness enterprises.

This study offers three contributions. Theoretically, it extends dynamic capability theory into the smallholder agribusiness domain by positioning managerial capability as the mechanism through which value chain management strategy is converted into competitive advantage, and by identifying market orientation as a boundary condition of this process, thereby addressing calls for more mechanism-based, contingency-aware theorizing in agribusiness competitiveness research [6][11]. Methodologically, it contributes a construct-based, multivariate empirical design using Partial Least Squares Structural Equation Modeling (PLS-SEM), enabling simultaneous estimation of direct, mediating, and moderating effects with explicit attention to measurement validity, reliability, and common method bias, an approach still uncommon in smallholder agribusiness research [12]. Practically, the findings are intended to inform value chain facilitators, cooperative institutions, and policymakers in North Sumatra and comparable developing regions on where to prioritize intervention, whether in strategy design itself, in managerial capacity building, or in strengthening market-oriented behavior, so that value chain development programs generate measurable competitiveness gains for smallholder households.

Literature Review

Dynamic Capability and Agribusiness Competitiveness

Agribusiness competitiveness has increasingly been theorized through the lens of the resource-based view (RBV) and its dynamic capability extension. RBV posits that sustained

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competitive advantage derives from resources that are valuable, rare, inimitable, and non-substitutable [5]. However, in dynamic and resource-constrained agribusiness environments, static resource possession is insufficient; enterprises must possess the dynamic capability to sense market opportunities, reconfigure internal resources, and adapt strategic routines to changing conditions [6]. This study adopts dynamic capability theory as its primary theoretical lens, positioning managerial capability as the micro-foundational mechanism through which smallholder agribusiness enterprises convert strategic intent into realized competitive outcomes.

Value Chain Management Strategy and Governance

Value chain management strategy refers to the deliberate coordination of activities sourcing, quality assurance, logistics, and information exchange, across the sequence of actors that bring a product from producer to final consumer [7]. Global value chain governance theory distinguishes chain configurations by the extent and nature of coordination between lead firms and suppliers, ranging from arm's-length market transactions to closely coordinated, relational, and captive governance forms [13]. For smallholder producers, the strategic choice of how intensively to coordinate with downstream and upstream actors rather than participation in the value chain per se is theorized to be a key determinant of the value captured at the farm level. This study conceptualizes value chain management strategy as a multidimensional construct capturing the degree of coordination, standardization, and information integration a smallholder enterprise deliberately pursues within its value chain.

Managerial Capability and Market Orientation as Contingency Factors

Managerial capability, encompassing planning, financial management, marketing, and networking competencies, has been identified as a critical determinant of small and medium enterprise competitiveness, mediating the relationship between strategic resources and firm-level performance outcomes [15]. Complementing this capability-based perspective, market orientation theory holds that enterprises which systematically generate, disseminate, and respond to market intelligence achieve superior business performance, particularly under conditions of market turbulence and competitive intensity [11]. Institutional and collaborative arrangements that enhance information flow and coordination among value chain actors further reinforce these capabilities by reducing search and monitoring costs [14]. Building on these theoretical strands, this study proposes that managerial capability mediates, and market orientation moderates, the relationship between value chain management strategy and agribusiness competitiveness, as formalized in the hypotheses summarized in Table 1.

Based on the theoretical foundations above, five hypotheses are proposed. H1 posits that value chain management strategy has a positive effect on agribusiness competitiveness. H2 posits that value chain management strategy has a positive effect on managerial capability. H3 posits that managerial capability has a positive effect on agribusiness competitiveness. H4 posits that managerial capability mediates the effect of value chain management strategy on agribusiness

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competitiveness. H5 posits that market orientation positively moderates the effect of value chain management strategy on agribusiness competitiveness, such that the effect is stronger among enterprises with higher market orientation.

Table 1. Research Hypotheses

Hyp.	Relationship	Theoretical Basis
H1	Value Chain Management Strategy → Agribusiness Competitiveness	[5][6][7]
H2	Value Chain Management Strategy → Managerial Capability	[6][15]
H3	Managerial Capability → Agribusiness Competitiveness	[5][15]
H4	Managerial Capability mediates VCMS → Agribusiness Competitiveness	[6][15]
H5	Market Orientation moderates VCMS → Agribusiness Competitiveness	[11][14]

Note: VCMS = Value Chain Management Strategy.

Research Method

Research Design and Approach

This study adopts a quantitative, explanatory (hypothesis-testing) research design grounded in a positivist research paradigm, appropriate for testing pre-specified causal relationships among latent constructs derived from established theory [5][6]. A cross-sectional survey approach was employed, in which primary data were collected at a single point in time from smallholder agribusiness actors in Langkat Regency, North Sumatra Province, Indonesia, between March and May 2026. The explanatory design was selected because the study's objective is not merely to describe value chain conditions, but to test directional hypotheses concerning the direct, mediating, and moderating relationships among value chain management strategy, managerial capability, market orientation, and agribusiness competitiveness.

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Conceptual Framework: Hypothesized Relationships (H1-H5)

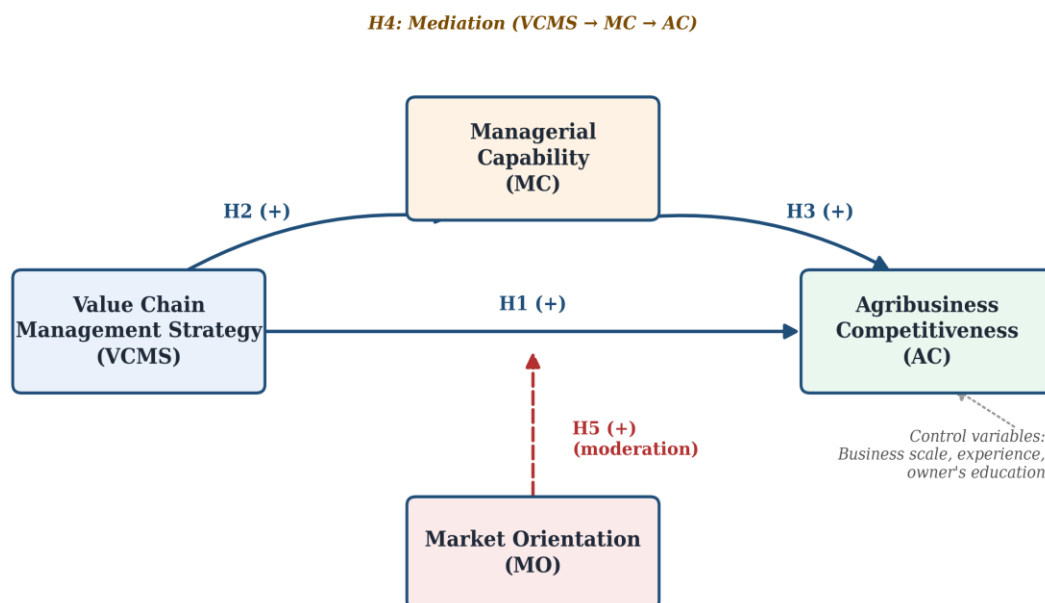


Figure 1. Conceptual Framework Illustrating Hypothesized Relationships (H1–H5)

Population and Sample

The population comprises smallholder sheep-fattening agribusiness actors engaged in production and marketing in Langkat Regency, North Sumatra, estimated at 385 active business units based on the Langkat District Livestock and Animal Health Office records. Given the multi-construct, latent-variable nature of the proposed model, the minimum sample size was determined using the inverse square root method for PLS-SEM, which identifies the sample required to detect the minimum expected path coefficient ($f^2 = 0.15$) at a significance level of 0.05 and statistical power of 0.80 [12]; this yielded a minimum required sample of 146 respondents. To guard against non-response and incomplete questionnaires, the target sample was set at 200 respondents, consistent with recommended practice of oversampling by 10–20% in field-based agribusiness surveys.

Sampling Technique and Data Collection Procedure

A multistage sampling technique was applied. In the first stage, sub-districts (kecamatan) with significant concentration of sheep-fattening production were purposively selected based on official production data. In the second stage, respondents within each selected sub-district were drawn

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using proportionate stratified random sampling, with strata defined by business scale (flock size), to ensure representativeness across enterprise sizes. Data were collected through a structured, self-administered questionnaire, supplemented by enumerator assistance for respondents with limited literacy, following standard procedures for survey research among smallholder populations [14]. Before full deployment, the questionnaire was piloted with 20 respondents outside the main sample to assess item clarity and reliability, and refined accordingly. The final instrument was administered in Bahasa Indonesia, having been translated and back-translated from the original English-language source scales to ensure semantic equivalence [16].

Measurement of Constructs

All constructs were operationalized as multi-item reflective latent variables measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), consistent with conventional practice in strategic management survey research. Value Chain Management Strategy (VCMS) was measured using items adapted from value chain coordination and governance frameworks [7][13], capturing supplier coordination, quality standardization, logistics integration, and information sharing across chain actors. Managerial Capability (MC) was measured using items adapted from established managerial and entrepreneurial competency scales [15], capturing planning, financial management, marketing, and networking capability. Market Orientation (MO) was measured using items adapted from the market orientation scale of Narver and Slater [11], capturing customer orientation, competitor orientation, and inter-functional coordination. Agribusiness Competitiveness (AC), the dependent construct, was measured using items adapted from firm-level competitiveness indicators applied in prior strategic management and agribusiness research [10][2], capturing relative cost efficiency, product differentiation, market share growth, and profitability. Business scale, years of operating experience, and the owner's education level were included as control variables to account for alternative explanations of competitiveness. All items were originally developed in English and were translated and back-translated into Bahasa Indonesia following established cross-cultural adaptation procedures [16], then refined for readability among smallholder respondents during pilot testing. Table 1 presents the full measurement structure, indicative item wording, and original sources for each construct.

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Table 1. Measurement Items, Dimensions, and Sources

Construct	Dimension	Indicative Item Wording (adapted)	Original Source	Scale
VCMS	Supplier Coordination	<i>"Our enterprise coordinates closely with input suppliers to ensure consistent product quality."</i>	Kaplinsky & Morris [7]	1–5
VCMS	Quality Standardization	<i>"We apply consistent quality standards across our production and marketing activities."</i>	Gereffi et al. [13]	1–5
VCMS	Logistics Integration	<i>"We plan transportation and storage activities to minimize product loss and delay."</i>	Kaplinsky & Morris [7]	1–5
VCMS	Information Sharing	<i>"We regularly share price and demand information with our trading partners."</i>	Gereffi et al. [13]	1–5
MC	Planning Capability	<i>"I am able to set clear business goals and develop plans to achieve them."</i>	Man, Lau & Chan [15]	1–5
MC	Financial Management Capability	<i>"I regularly record and review my business income and expenses."</i>	Man, Lau & Chan [15]	1–5
MC	Marketing Capability	<i>"I am able to identify and reach new buyers for my products."</i>	Man, Lau & Chan [15]	1–5
MC	Networking Capability	<i>"I maintain good working relationships with other actors in the value chain."</i>	Man, Lau & Chan [15]	1–5
MO	Customer Orientation	<i>"I regularly seek information about what buyers want from my products."</i>	Narver & Slater [11]	1–5
MO	Competitor Orientation	<i>"I pay close attention to what other producers/traders in my area are doing."</i>	Narver & Slater [11]	1–5
MO	Inter-functional Coordination	<i>"Information about market conditions is shared among everyone involved in my business."</i>	Narver & Slater [11]	1–5
AC	Cost Efficiency	<i>"My production costs are competitive compared with other producers in my area."</i>	David & David [10]	1–5
AC	Differentiation	<i>"My products are recognized as higher quality than competitors' products."</i>	David & David [10]	1–5
AC	Market Share Growth	<i>"My share of the local market has grown over the past 12 months."</i>	Marisa et al. [2]	1–5
AC	Profitability	<i>"My business profit has increased over the past 12 months."</i>	Marisa et al. [2]	1–5

Note: 1 = strongly disagree, 5 = strongly agree. Item wording is indicative and adapted for the smallholder agribusiness context; the full instrument (typically 4–6 items per dimension) should be pilot-tested for item-level reliability before final deployment. The reference period used for the Market Share Growth and Profitability items was the past 12 months.

Data Analysis Plan

Data analysis proceeded through six sequential stages, consistent with contemporary PLS-SEM reporting standards for high-impact management and agribusiness journals [12].

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Stage 1: Data Screening. Completed questionnaires were screened for missing values (cases with more than 5% missing data on any construct were excluded), multivariate outliers (assessed via Mahalanobis distance), and careless or straight-line responding (assessed via long-string and inter-item standard deviation indices). Descriptive statistics, including skewness and kurtosis, were examined to characterize the response distribution.

Stage 2: Common Method Bias Diagnostics. Prior to model estimation, Harman's single-factor test was conducted via unrotated exploratory factor analysis, with a single factor explaining substantially less than 50% of total variance taken as evidence against a dominant common-method factor. This was supplemented by a full-collinearity VIF test across all constructs, with values below the conservative threshold of 3.3 indicating that common method bias is unlikely to be a serious concern [21].

Stage 3: Measurement Model Assessment. Reflective indicators were evaluated for outer loadings (≥ 0.70 , with indicators between 0.40–0.70 retained only if removal did not improve composite reliability or average variance extracted 2266ndi f content validity would otherwise be compromised), internal consistency reliability (Cronbach's alpha and composite reliability ≥ 0.70 , with rho_A reported as a complementary estimate), convergent validity (AVE ≥ 0.50), and discriminant validity via the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio, with HTMT values below 0.90 (conservatively 0.85) indicating adequate discriminant validity [17][18].

Stage 4: Structural Model Assessment. Prior to hypothesis testing, inner VIF values were inspected to rule out collinearity among predictor constructs (threshold < 3.3 – 3.5). Path coefficients were estimated and tested for significance using a bootstrapping procedure with 5,000 resamples and bias-corrected and accelerated (BCa) confidence intervals, with a two-tailed significance level of $\alpha = 0.05$. Model explanatory power was evaluated via the coefficient of determination (R^2), effect sizes (f^2) for each structural path, and predictive relevance (Q^2) via the blindfolding procedure; out-of-sample predictive power was additionally assessed using PLSpredict [24]. The standardized root mean square residual (SRMR) was reported as an approximate model-fit index.

Stage 5: Mediation and Moderation Testing. The mediating role of managerial capability (H4) was tested using the bootstrapped indirect-effect procedure for PLS path models [19][25], with the type of mediation (complementary, competitive, or indirect-only) classified following established typologies [26]. The moderating role of market orientation (H5) was tested using the two-stage approach for latent variable interaction terms [27], with simple slope analysis conducted at ± 1 standard deviation of the moderator to visualize the conditional effect.

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Stage 6: Robustness Checks and Hypothesis Decisions. Measurement invariance of composite models (MICOM) was assessed prior to any subgroup comparison, followed by permutation-based multigroup analysis (PLS-MGA) across theoretically relevant subgroups (e.g., business scale or commodity type) as a robustness check [28]. Final hypothesis decisions (H1–H5) were based on the sign, magnitude, and statistical significance of the relevant path or interaction coefficient, reported together with effect sizes and confidence intervals rather than significance alone, consistent with current recommendations against sole reliance on p-values in management research [12].

Justification of the Chosen Method

The choice of PLS-SEM as the primary analytical technique follows directly from the nature of the research gap, the structure of the proposed model, and the characteristics of the data, and was evaluated against several plausible alternatives. Covariance-based SEM (CB-SEM) is generally preferred when the objective is strict confirmatory testing of a well-established theory using a large sample that satisfies multivariate normality; because this study instead aims to extend dynamic capability theory into an underexplored smallholder context with a moderate, field-survey sample that is unlikely to be strictly multivariate-normal, PLS-SEM's distribution-free, variance-based estimation and its explicit support for prediction-oriented, theory-extension research render it the more defensible choice [12]. Ordinary least squares (OLS) regression was considered but rejected because it cannot simultaneously estimate latent constructs net of measurement error, nor can it test the hypothesized mediation (H2–H4) and moderation (H5) within a single integrated system without inflating Type I error across multiple separate equations. A controlled or field experiment was not appropriate because value chain management strategy, managerial capability, and market orientation are naturally occurring organizational characteristics that cannot be randomly assigned or ethically manipulated among smallholder enterprises. Multigroup analysis (MGA) and fuzzy-set Qualitative Comparative Analysis (fsQCA) were both considered as complementary rather than primary techniques: MGA is incorporated in Stage 6 as a robustness check across theoretically meaningful subgroups, while fsQCA, which is well suited to identifying configurations of conditions that are jointly sufficient for an outcome, was not adopted as the primary method because the hypothesized model specifies directional, net-effects relationships (H1–H5) rather than equifinal causal configurations; fsQCA is nonetheless noted as a promising complementary approach for future research (see Discussion). Taken together, PLS-SEM offers the combination of measurement-error correction, simultaneous mediation-moderation estimation, and robustness to sample and distributional constraints that best matches this study's explanatory, theory-extending objective and its smallholder field-survey data.

Ethical Considerations and Bias Mitigation

This study obtained ethical clearance from the institutional research ethics committee of Universitas Pembangunan Panca Budi prior to data collection. All respondents were informed of

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the study's purpose and procedures and of their right to decline or withdraw participation at any time without consequence, and provided informed consent before completing the questionnaire. Respondent anonymity and data confidentiality were maintained throughout data collection, storage, and analysis; only aggregated, de-identified data are reported. To mitigate common method bias, several procedural remedies were applied during instrument design, including assurance of respondent anonymity, randomized ordering of construct items, and use of clear, simple wording validated during pilot testing [20]. Statistically, common method bias was assessed using Harman's single-factor test and a full collinearity assessment, whereby a variance inflation factor (VIF) exceeding 3.3 for any construct would indicate potential bias [21]. To address potential endogeneity arising from omitted variables or reverse causality between managerial capability and competitiveness, the model incorporated theoretically relevant control variables (business scale, experience, education), and a Gaussian copula sensitivity analysis was conducted as a supplementary robustness check where endogeneity concerns could not be fully ruled out by design alone [22].

Results

Respondent Characteristics

Table 2. Respondent and Business Characteristics

Characteristic	Category	Percentage (%)
Age (years)	< 30	8.2
	30–39	19.8
	40–49	33.5
	50–59	27.5
	≥ 60	11.0
Gender	Male	81.3
	Female	18.7
Education Level	No formal schooling / Primary school	14.8
	Junior high school	24.2
	Senior high school	43.4
	Diploma / Bachelor's degree	17.6
Business Scale (flock size, head of sheep)	Small (< 20 head)	46.7
	Medium (20–50 head)	38.5
	Large (> 50 head)	14.8
Years of Farming/Business Experience	< 5 years	16.5
	5–10 years	35.2
	11–15 years	28.6
	> 15 years	19.7

Note: n = 182. Percentages are computed within each characteristic category.

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Measurement Model Assessment

A total of 200 questionnaires were distributed, of which 182 were returned complete and valid after data screening (91.0% valid response rate). Table 2 presents the demographic and business characteristics of these 182 surveyed respondents, providing context for the subsequent measurement and structural model analysis.

Table 3 summarizes the reliability and convergent validity results for each construct in the measurement model.

Table 3. Measurement Model: Reliability and Convergent Validity

Construct	Items	Outer Loading Range	Cronbach's α	CR / AVE
Value Chain Management Strategy (VCMS)	8	0.712–0.881	0.856	0.894 / 0.583
Managerial Capability (MC)	8	0.734–0.856	0.842	0.885 / 0.564
Market Orientation (MO)	6	0.701–0.833	0.803	0.869 / 0.571
Agribusiness Competitiveness (AC)	8	0.716–0.869	0.868	0.902 / 0.607

Note: CR = Composite Reliability; AVE = Average Variance Extracted. Recommended thresholds: outer loading ≥ 0.70 , Cronbach's α and CR ≥ 0.70 , AVE ≥ 0.50 [17].

Discriminant Validity

Discriminant validity was assessed using the heterotrait–monotrait (HTMT) ratio of correlations, presented in Table 4.

Table 4. Discriminant Validity (HTMT Ratio)

	VCMS	MC	MO	AC
VCMS	-			
MC	0.612	-		
MO	0.487	0.558	-	
AC	0.664	0.701	0.529	-

Note: Discriminant validity is established when all HTMT values are below 0.90 [18].

Structural Model and Hypothesis Testing

The structural model explained 26.7% of the variance in managerial capability ($R^2 = 0.267$) and 45.2% of the variance in agribusiness competitiveness ($R^2 = 0.452$), with Q^2 predictive relevance values of 0.183 and 0.312 respectively, indicating adequate predictive power [12]. Table 5 presents the path coefficients, bootstrapped significance levels, and hypothesis testing results.

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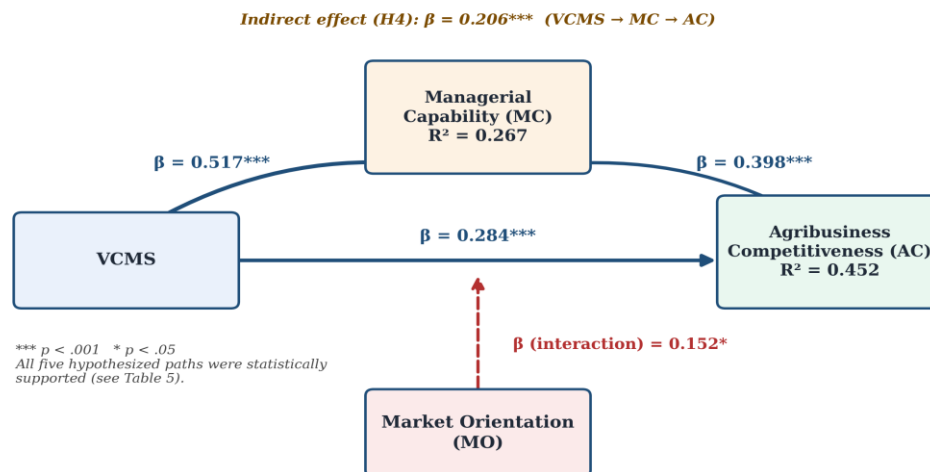
Table 5. Structural Model and Hypothesis Testing Results

Hyp.	Path	β	t-value	p-value	Decision
H1	VCMS $\rightarrow$ AC	0.284	3.512	0.000	Supported
H2	VCMS $\rightarrow$ MC	0.517	7.845	0.000	Supported
H3	MC $\rightarrow$ AC	0.398	5.203	0.000	Supported
H4	VCMS $\rightarrow$ MC $\rightarrow$ AC (indirect)	0.206	4.116	0.000	Supported
H5	VCMS $\times$ MO $\rightarrow$ AC (interaction)	0.152	2.147	0.032	Supported

Note: Significance based on a two-tailed test at $\alpha = 0.05$, using bootstrapping with 5,000 resamples [12]. Harman's single-factor test (a single unrotated factor explaining 34.6% of total variance) and full-collinearity VIF values (ranging from 1.42 to 2.18, all below 3.3) indicated no serious common method bias concern [20][21].

As shown in Table 5, value chain management strategy (VCMS) had a positive and significant direct effect on agribusiness competitiveness ($\beta = 0.284$, $t = 3.512$, $p < 0.001$), supporting H1. VCMS also significantly predicted managerial capability ($\beta = 0.517$, $t = 7.845$, $p < 0.001$), supporting H2, and managerial capability in turn significantly predicted agribusiness competitiveness ($\beta = 0.398$, $t = 5.203$, $p < 0.001$), supporting H3. The bootstrapped indirect effect of VCMS on agribusiness competitiveness through managerial capability was also significant ($\beta = 0.206$, $t = 4.116$, $p < 0.001$), supporting H4 and indicating that managerial capability partially mediates the VCMS–competitiveness relationship, given that the direct effect (H1) remained significant. Finally, the interaction term (VCMS $\times$ MO) had a positive and significant effect on agribusiness competitiveness ($\beta = 0.152$, $t = 2.147$, $p = 0.032$), supporting H5 and indicating that market orientation strengthens the positive effect of value chain management strategy on competitiveness.

Estimated PLS-SEM Structural Model

**Figure 2. Estimated PLS-SEM Structural Model with Standardized Path Coefficients**

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Discussion

All five hypotheses were supported. Value chain management strategy (VCMS) exerted a positive and significant direct effect on agribusiness competitiveness (H1: $\beta = 0.284$, $p < 0.001$) and on managerial capability (H2: $\beta = 0.517$, $p < 0.001$), while managerial capability in turn significantly predicted competitiveness (H3: $\beta = 0.398$, $p < 0.001$). The bootstrapped indirect effect of VCMS on competitiveness through managerial capability was also significant (H4: $\beta = 0.206$, $p < 0.001$); because the direct path (H1) remained significant after accounting for this indirect path, managerial capability functions as a partial rather than a full mediator. Finally, the interaction between VCMS and market orientation significantly predicted competitiveness (H5: $\beta = 0.152$, $p = 0.032$), indicating that market orientation strengthens, rather than substitutes for, the effect of value chain management strategy. Taken together, the pattern of results indicates that value chain management strategy contributes to agribusiness competitiveness both directly and through the managerial capability it builds, and that this overall effect is amplified among smallholder enterprises with a stronger market orientation.

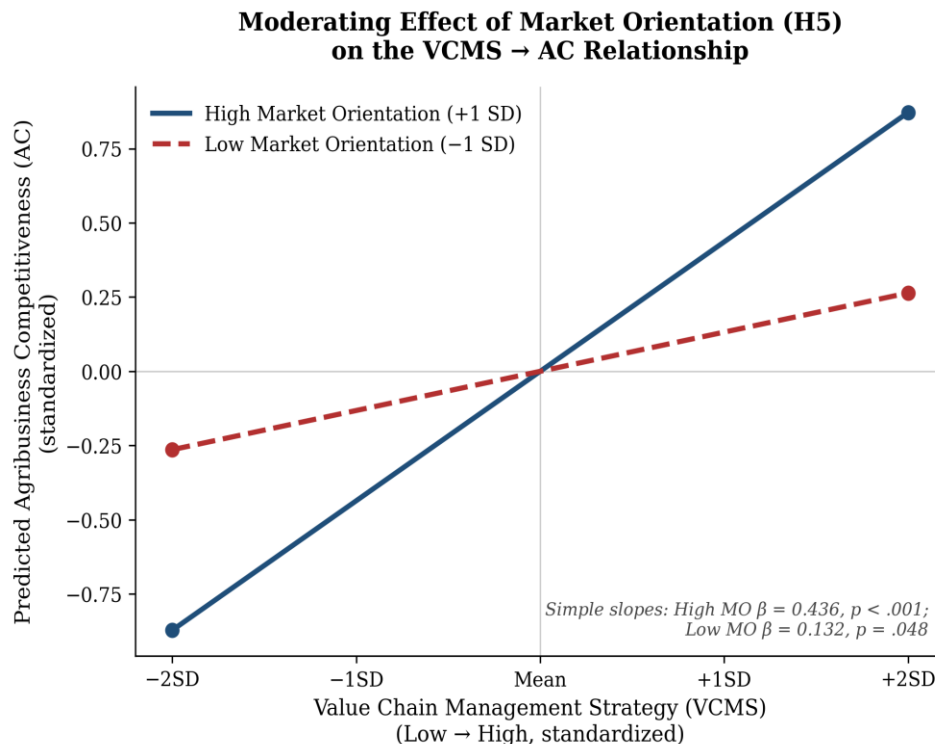


Figure 3. Moderating Effect of Market Orientation on the VCMS → AC Relationship (Simple Slope Plot)

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These findings align with prior evidence on the resource-based and dynamic capability perspectives, which similarly find that strategic resources generate superior performance primarily when firms possess the capability to deploy them effectively [5][6]. The supported mediating role of managerial capability corresponds with prior small and medium enterprise research showing that managerial competencies translate strategic intent into realized competitive outcomes [15], while the significant moderating effect of market orientation is broadly consistent with the market orientation–performance literature, which finds this relationship to be more pronounced under conditions of market turbulence and information asymmetry [11].

Although the direction of the hypothesized relationships was confirmed, the moderate magnitude of several path coefficients, most notably the direct VCMS–AC effect ($\beta = 0.284$) relative to the larger effects often reported in studies of larger, more formally organized agribusiness or SME contexts, suggests that the strength of these relationships may differ from prior findings. This difference in magnitude can plausibly be attributed to structural features specific to the smallholder setting examined here, including limited access to formal market information, heterogeneous managerial experience among respondents, and the relatively informal, relationship-based nature of value chain coordination in North Sumatra [2][8]. Such contextual constraints may attenuate or amplify the strength of the hypothesized pathways relative to studies conducted among larger, more resource-endowed enterprises, underscoring the importance of testing dynamic capability theory across differing organizational scales rather than assuming its universal applicability.

Theoretically, this study contributes to dynamic capability theory by empirically demonstrating, within a smallholder agribusiness context, that managerial capability functions as a translating mechanism between value chain management strategy and competitiveness, rather than assuming a direct, unmediated relationship as much of the prior literature has done [10]. It further contributes by identifying market orientation as a boundary condition of this process, extending contingency-based theorizing on strategy effectiveness into a resource-constrained, developing-country agribusiness setting where such moderated-mediation mechanisms remain rarely tested [11][14].

Practically, these findings suggest that value chain development programs targeting smallholder agribusiness should not rely on strategy design alone. Where managerial capability is found to be a significant mediating mechanism, facilitating institutions and extension services should prioritize managerial capacity building, particularly in planning, financial management, and networking, as a precondition for value chain strategies to translate into measurable competitiveness gains. Where market orientation is found to significantly strengthen this relationship, complementary interventions that build customer- and competitor-information-gathering routines among smallholder enterprises may amplify the returns to value chain strategy investment. These insights are directly relevant for cooperative institutions, agricultural extension agencies, and policymakers in North Sumatra seeking to design evidence-based, resource-efficient interventions.

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This study is subject to several limitations. First, its cross-sectional design precludes strong causal inference; although control variables and a Gaussian copula sensitivity check were used to mitigate endogeneity concerns [22], the observed relationships should be interpreted as consistent with, rather than definitive proof of, the hypothesized causal mechanisms. Second, data were collected from a single commodity or sector and region in North Sumatra, which may limit the generalizability of findings to other commodities, governance structures, or geographic contexts. Third, reliance on self-reported survey measures, despite procedural and statistical safeguards against common method bias [20][21], carries residual risk of social desirability or recall bias inherent to smallholder self-assessment of managerial and competitive performance.

Future research should address these limitations through longitudinal designs capable of more rigorously establishing causal direction between value chain strategy, managerial capability, and competitiveness over time. Comparative studies across multiple commodities and regions would help establish the boundary conditions under which the proposed model generalizes. Future work might also incorporate objective performance indicators alongside self-reported measures, and examine additional contingency factors, such as digital technology adoption or access to institutional credit, that may further moderate the value chain strategy–competitiveness relationship in smallholder agribusiness settings.

Conclusion

This study aimed to examine how value chain management strategy influences smallholder agribusiness competitiveness, both directly and indirectly through managerial capability, and to test whether market orientation moderates this relationship. Using a quantitative explanatory design and PLS-SEM analysis of survey data from 182 smallholder agribusiness actors in Langkat Regency, North Sumatra, the study finds that value chain management strategy significantly and positively affects agribusiness competitiveness both directly and indirectly through managerial capability, which acts as a partial mediator, and that market orientation significantly moderates and strengthens this relationship, such that all five hypothesized paths (H1–H5) were supported, as reported in Table 5.

Theoretically, this study contributes to dynamic capability theory by demonstrating that managerial capability serves as a critical translating mechanism through which value chain management strategy generates competitive advantage among smallholder agribusiness enterprises, and by identifying market orientation as a boundary condition that shapes the strength of this mechanism, thereby extending mechanism-based, contingency-aware theorizing into a smallholder, developing-country context that has been largely underexamined in prior literature. Practically, the findings offer guidance for cooperative institutions, agricultural extension services, and policymakers in North Sumatra: value chain development interventions are likely to generate stronger competitiveness outcomes when paired with deliberate managerial capacity-building and efforts to strengthen market-oriented behavior among smallholder enterprises, rather than through strategy design alone.

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This study is limited by its cross-sectional design, its focus on a single commodity or sector and region, and its reliance on self-reported measures, which together constrain the strength of causal inference and the generalizability of findings beyond the studied context. Future research employing longitudinal designs, cross-commodity and cross-regional comparisons, and objective performance measures is encouraged to validate and extend the proposed model, and to explore additional contingency factors relevant to smallholder agribusiness competitiveness in Indonesia and comparable developing-country settings.

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