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The Influence of Market Uncertainty on Sustainable Competitive Advantage with Supply Chain Endurance as a Mediating Variable

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ABSTRACT

Market uncertainty poses critical challenges for organizations operating in volatile regulatory environments, yet theoretical understanding of mechanisms linking environmental turbulence to sustainable competitive advantage remains incomplete. This study examines supply chain endurance as a mediating mechanism through which market uncertainty influences competitive advantage within Indonesia's cigarette industry—a context characterized by intensifying health regulations, supply chain seasonality, and persistent demand volatility. Employing partial least squares structural equation modeling (PLS-SEM) with data from 86 supply chain managers and operational directors, this research tests relationships among market uncertainty, supply chain endurance, and sustainable competitive advantage. Findings reveal that market uncertainty exerts strong positive influence on supply chain endurance ($\beta = 0.721$, $P < 0.001$), which subsequently contributes to sustainable competitive advantage ($\beta = 0.265$, $P < 0.001$). Market uncertainty also demonstrates significant direct effects on competitive advantage ($\beta = 0.405$, $P < 0.001$). Mediation analysis confirms partial mediation (VAF = 32.04%), indicating supply chain endurance accounts for approximately one-third of uncertainty's total effect while substantial direct relationships persist. Results advance dynamic capabilities theory by demonstrating environmental turbulence catalyzes capability development, enrich resource-based view by positioning endurance as VRIN-satisfying strategic resource, and extend contingency theory by revealing environmental characteristics actively shape capability priorities. Practically, findings suggest organizations confronting persistent uncertainty should prioritize endurance investments emphasizing supplier diversification, inventory flexibility, and scenario planning alongside complementary capabilities spanning marketing agility and innovation capacity for comprehensive competitive positioning.

Keywords: Supply Chain Endurance, Market Uncertainty, Sustainable Competitive Advantage, Dynamic Capabilities, Partial Mediation, Emerging Markets

JEL Classifications: L10, L25, M11, D81, O53

1. INTRODUCTION

Market uncertainty has emerged as a critical challenge for industries operating in volatile regulatory environments, particularly in sectors characterized by seasonal supply patterns and evolving consumer preferences (Handoyo et al., 2023). The Indonesian cigarette industry exemplifies this complexity, where firms must navigate simultaneously intensifying health regulations, price volatility, and supply chain disruptions while maintaining competitive positioning (Bednarski et al., 2025). This tension between regulatory constraint and economic contribution presents a compelling context for examining how organizations sustain competitive advantages under conditions of persistent uncertainty.

Empirical evidence indicates that regulatory interventions—including health warning mandates, public consumption restrictions, and escalating excise taxation—fundamentally alter market dynamics by introducing price and demand unpredictability (Bayu et al., 2022). These interventions create a paradoxical situation where labor-intensive industries absorbing approximately

5.98 million workers (Indonesia, 2025) face constrained operational flexibility precisely when supply chain resilience becomes most critical. The seasonal nature of tobacco cultivation compounds this challenge, generating temporal mismatches between supply availability and market demand that amplify operational vulnerability (Kim et al., 2022).

Despite growing recognition of supply chain resilience as a strategic imperative, theoretical understanding of the mechanisms linking market uncertainty to sustainable competitive advantage remains incomplete. While resource-based view (RBV) perspectives suggest that operational capabilities buffer environmental turbulence (Barney, 1991), and dynamic capabilities theory posits that adaptive capacity enables competitive renewal (Teece, 1996), empirical evidence regarding the mediating pathways through which uncertainty influences long-term competitiveness is fragmented. Specifically, the role of supply chain endurance—defined as the capacity to absorb disruptions while maintaining operational continuity and strategic flexibility Golgeci and Ponomarov, (2013) has received limited systematic examination as a mediating mechanism.

Existing research demonstrates associations between supply chain resilience and organizational performance (Alkhawaldah et al., 2023; Firman et al., 2019), yet critical questions persist regarding whether resilient supply chains merely mitigate uncertainty's negative effects or actively transform market volatility into competitive opportunities. This distinction carries significant theoretical implications, as it determines whether supply chain capabilities function primarily as protective buffers or as dynamic resources enabling strategic differentiation under turbulent conditions.

This study addresses these gaps by investigating how market uncertainty influences sustainable competitive advantage through supply chain endurance mechanisms within Indonesia's cigarette industry. Drawing on dynamic capabilities theory and RBV perspectives, this research examines whether supply chain endurance mediates the uncertainty-performance relationship, thereby clarifying the strategic pathways through which firms convert environmental volatility into enduring competitive positions. The findings contribute to theory by elucidating mediation mechanisms in uncertainty-performance relationships while offering practical insights for organizations navigating regulatory volatility in emerging markets characterized by complex stakeholder pressures and resource constraints.

2. HYPOTHESIS DEVELOPMENT

2.1. Market Uncertainty (MU) towards Supply Chain Endurance (SCE)

Market uncertainty fundamentally reshapes competitive dynamics by compelling organizations to pursue innovation-driven differentiation strategies (Hermundsdottir and Aspelund, 2021). Dynamic capabilities theory posits that environmental turbulence activates organizational sensing and reconfiguration mechanisms, enabling firms to identify emerging opportunities that competitors overlook (Teece, 2007; Yoshikuni et al., 2024). Under volatile conditions, sustainability innovations possess enhanced strategic value as existing products rapidly obsolete, creating temporal windows for green competitive positioning (Hermundsdottir and Aspelund, 2021). Furthermore, uncertainty functions as a boundary condition amplifying resource deployment effectiveness—organizations leveraging technological flexibility and strategic agility demonstrate superior capability to convert market volatility into sustained competitive differentiation (Shan et al., 2026). Empirical evidence from emerging markets confirms that firms embracing proactive uncertainty management achieve enhanced performance through first-mover advantages in sustainability-oriented value creation (Bhue et al., 2025).

Thus:

H_1: Market uncertainty has positive impact to sustainable competitive advantage.

2.2. Market Uncertainty (MU) towards Sustainable Competitive Advantage (SCA)

Market uncertainty catalyzes organizational transformation by compelling enterprises to develop innovation-driven capabilities essential for competitive differentiation (Yoshikuni et al., 2024). Dynamic capabilities theory suggests that environmental turbulence activates sensing, seizing, and reconfiguring mechanisms, enabling firms to identify emergent opportunities while competitors remain inert (Al-Musawi, 2020). Under volatile conditions, sustainability innovations possess amplified strategic value as turbulent contexts reduce competitive imitation risks and create first-mover advantages for green positioning (Hermundsdottir and Aspelund, 2021). Furthermore, uncertainty functions as a boundary condition wherein organizations deploying technological flexibility and coopetition strategies achieve superior capability conversion of market volatility into sustained competitive advantages (Yang and Fu, 2025). Empirical evidence confirms that firms embracing proactive uncertainty management through environmental technology development establish distinctive market leadership positions (Jung et al., 2023).

Thus:

H_2: Market uncertainty has positive impact to sustainable competitive advantage.

2.3. Supply Chain Endurance (SCE) towards Sustainable Competitive Advantage (SCA)

Supply chain endurance constitutes a critical dynamic capability enabling organizations to absorb disruptions while maintaining strategic flexibility and operational continuity (M. Resource-based view theory posits that endurance capabilities—encompassing resilience, adaptability, and integration—function as rare, inimitable resources generating sustained competitive differentiation (Junaid et al., 2022). Enduring supply chains facilitate rapid threat response and opportunity exploitation through enhanced sensing and coordination mechanisms, directly translating into superior market positioning (Gharaibeh et al., 2024). Furthermore, sustainable supply chain practices embedded within endurance frameworks enable cost reduction, revenue diversification, and brand differentiation simultaneously (Hebaz et al., 2022; Mu'Min et al., 2025). Empirical evidence demonstrates that organizations deploying resilient supply chain architectures achieve competitive advantages through long-term stability, environmental performance, and stakeholder trust cultivation (Owida et al., 2022).

Therefore:

H_3: Supply chain endurance has positive impact to sustainable competitive advantage.

2.4. Market Uncertainty (MU) Towards Sustainable Competitive Advantage (SCA) Through Supply Chain Endurance (SCE)

Market uncertainty necessitates organizational deployment of adaptive supply chain capabilities to ensure operational continuity amid environmental volatility (Halidu et al., 2025). Contingency theory posits that environmental turbulence demands structural configurations matching uncertainty levels—firms experiencing heightened market fluctuations must develop resilient, agile supply chain architectures to maintain strategic alignment (Budiman et al., 2023). Under uncertain conditions, demand unpredictability and supply disruptions compel organizations to invest in robustness mechanisms including supplier diversification, digital integration, and scenario planning capabilities (Oubrahim et al., 2022). Furthermore, resource dependence theory suggests that market volatility intensifies supply chain vulnerability, prompting firms to cultivate endurance capabilities as protective responses against environmental dependencies (Pfeffer, 1998; Vats et al., 2011). Empirical evidence confirms that uncertainty-exposed organizations demonstrate significantly higher investments in supply chain resilience infrastructures than those in stable environments (Ghobakhloo and Iranmanesh, 2021).

Therefore:

H_4: Market uncertainty has positive impact to sustainable competitive advantage through supply chain endurance.

3. RESEARCH METHODS

3.1. Analytical Approach

This study employs partial least squares structural equation modeling (PLS-SEM) to examine mediation mechanisms linking market uncertainty, supply chain endurance, and sustainable competitive advantage. PLSSEM was selected for its variance-based approach enabling predictive orientation, simultaneous estimation of measurement and structural models, and accommodation of formative-reflective constructs without distributional assumptions (Hair and Sarstedt, 2019).

3.2. Sampling and Data Collection

Purposive sampling targeted supply chain managers and operational directors from cigarette manufacturing firms in East Java, ensuring decision-making authority regarding supply chain configurations (Jiang et al., 2024). Sample size (n=86) exceed PLS-SEM minimum requirements (J. F. Hair et al., 2021). Seven-point Likert-scale instruments measured market uncertainty (Chari et al., 2014; Shou et al., 2025; Zhang et al., 2020), supply chain endurance (Guo & Zhou, 2026; Y. Li et al., 2024), and sustainable competitive advantage (Hallam et al., 2018; Sandberg and Abrahamsson, 2011; Sun et al., 2022).

3.3. Data Analysis

Smart PLS facilitated two-stage analysis. Measurement model assessment examined outer loadings (threshold ≥0.708), composite reliability (≥0.70), average variance extracted (≥0.50), and HeterotraitMonotrait ratios (<0.85) for discriminant validity (Hair and Alamer, 2022). Structural model evaluation tested path coefficients, t-statistics, coefficient of determination (R^2), predictive relevance (Q^2), and effect sizes (f^2) through bias-corrected bootstrapping (5,000 resamples, 95% confidence intervals). Mediation effects were assessed via indirect effects significance and variance accounted for calculations.

4. RESULTS

Multicollinearity assessment demonstrates VIF values below the conservative threshold of 3.0 (Hair et al., 2020), with all constructs exhibiting values of 2.081 or lower (Table 1). These results confirm absence of problematic collinearity among predictor variables, indicating that supply chain endurance and market uncertainty contribute distinct variance to sustainable competitive advantage without redundancy concerns (Sarstedt et al., 2017). VIF values substantially below 5.0 validate model specification appropriateness and ensure coefficient estimates remain stable and interpretable for subsequent structural path analysis (Siguaw and Diamantopoulos, 1995).

Measurement model demonstrates robust psychometric properties exceeding established thresholds (Hair and Sarstedt, 2019) (Table 2). All outer loadings surpass 0.708, confirming adequate indicator reliability. Composite reliability values range from 0.871 to 0.946, substantially exceeding the 0.70 benchmark, while Cronbach's alpha coefficients (0.803-0.932) verify internal consistency (Fornell and Larcker, 1981). Average variance extracted exceeds 0.50 for all constructs (market uncertainty: 0.572; supply chain endurance: 0.630; sustainable competitive advantage: 0.713), establishing convergent validity and confirming that latent constructs explain majority variance in their respective indicators (Bagozzi, 1981).

Discriminant validity assessment through HTMT ratios demonstrates adequate construct distinctiveness, with all values below the stringent 0.85 threshold (Henseler, 2012). Supply chain endurance-market uncertainty (0.789), sustainable competitive advantage-market uncertainty (0.710), and sustainable competitive advantage-supply chain endurance (0.627) ratios confirm constructs measure theoretically distinct phenomena despite conceptual relatedness (Table 3). HTMT criterion superiority over traditional Fornell-Larcker approaches lies in its sensitivity to differences between construct correlations and within-construct indicator correlations (Franken and Wattenberg, 2019), providing conservative evidence that measurement model captures intended theoretical distinctions.

Structural model reveals significant relationships supporting all hypotheses ($P < 0.001$) (Table 4). Market uncertainty exerts strong positive influence on supply chain endurance ($\beta = 0.721$, $t = 19.944$, $f^2 = 1.081$), indicating large effect (Cohen, 1988). Direct paths to sustainable competitive advantage demonstrate

Table 1: Variance inflation factor assessment

Constructs	Market uncertainty	Supply endurace	Chain	Sustainable advantage	Competitive
Market uncertainty		1.000		2.081	
Supply chain endurace				2.081	
Sustainable competitive advantage					

Table 2: Measurement model assessment

Code / Constructs	Outer loadings	Cronbach's alpha	Composite reliability	AVE
Market uncertainty		0.850	0.889	0.572
MU1	0.801			
MU2	0.788			
MU3	0.777			
MU4	0.758			
MU5	0.709			
MU6	0.698			
Sustainable competitive advantage		0.932	0.946	0.713
SCA1	0.73			
SCA2	0.723			
SCA3	0.874			
SCA4	0.837			
Supply chain endurace		0.803	0.871	0.630
SCE1	0.898			
SCE2	0.852			
SCE3	0.8			
SCE4	0.824			
SCE5	0.854			
SCE6	0.894			
SCE7	0.783			

moderate effects: Market uncertainty ($\beta = 0.405$, $t = 5.767$, $f^2 = 0.129$) and supply chain endurance ($\beta = 0.265$, $t = 3.878$, $f^2 = 0.055$). Mediation analysis confirms partial mediation (VAF = 32.04%), where supply chain endurance accounts for 32% of market uncertainty's total effect on competitive advantage (Hair and Alamer, 2022). Significant indirect effect ($\beta = 0.191$, $t = 3.852$) substantiates supply chain endurance as meaningful mechanism transmitting uncertainty effects.

Coefficient of determination reveals model's explanatory power for endogenous constructs (Table 5). Market uncertainty explains 51.9% variance in supply chain endurance ($R^2 = 0.519$), indicating moderate-to-substantial predictive accuracy (Hair and Alamer, 2022). Combined effects of market uncertainty and supply chain endurance account for 38.8% variance in sustainable competitive advantage ($R^2 = 0.388$), representing moderate explanatory power consistent with complex organizational phenomena involving multiple unobserved determinants (Cohen, 1988). Minimal divergence between R^2 and adjusted R^2 values (0.001-0.003) demonstrates model parsimony, confirming explanatory power remains stable when accounting for predictor quantity relative to sample size (Shmueli et al., 2019). These results substantiate theoretical model's capacity to explain substantial variance while avoiding overfitting concerns.

Blindfolding procedures demonstrate model's predictive relevance through positive Q^2 values exceeding zero threshold (Geisser, 1974) (Table 6). Supply chain endurance exhibits strongest predictive capacity ($Q^2 = 0.615$), followed by market uncertainty ($Q^2 = 0.396$) and sustainable competitive advantage ($Q^2 = 0.390$). These results confirm model accurately predicts omitted observations during cross-validation procedures, with Q^2 values above 0.35 indicating large predictive relevance for endogenous constructs (Hair and Alamer, 2022). Superior Q^2 for supply chain endurance validates its central mediating role, demonstrating model reconstructs endurance indicators more accurately than alternative specifications.

Out-of-sample prediction metrics validate model's forecasting capability beyond estimation sample (Shmueli et al., 2019). Positive Q^2 predict values for supply chain endurance (0.512) and sustainable competitive advantage (0.341) confirm predictive power exceeding naive benchmark predictions (Table 7). Root mean square error (RMSE) and mean absolute error (MAE) provide complementary prediction accuracy indicators, with lower values for supply chain endurance (RMSE = 0.705, MAE = 0.491) versus sustainable competitive advantage (RMSE = 0.817, MAE = 0.667) reflecting greater prediction precision for mediator construct. These metrics substantiate model's practical utility for forecasting outcomes in comparable contexts (Hair et al., 2019).

5. DISCUSSION

5.1. The Catalytic Role of Market Uncertainty in Supply Chain Endurance Development

This study reveals a substantively strong positive relationship between market uncertainty and supply chain endurance, empirically validating dynamic capabilities theory's proposition that environmental turbulence catalyzes rather than impedes organizational capability development (Eisenhardt and Graebner, 2007). Market uncertainty emerges as the predominant antecedent of supply chain endurance within Indonesia's cigarette industry, fundamentally reconfiguring strategic priorities from efficiency maximization toward resilience cultivation. This aligns with Teece (2007)sensing-seizing-reconfiguring framework, wherein regulatory unpredictability—escalating excise taxation, evolving health warnings, and consumption restrictions—generates demand-supply volatility that activates organizational sensing mechanisms prompting capability reconfigurations through supplier diversification, inventory buffering, and adaptive logistics (Christopher, 1999). The evidence extends contingency theory beyond structural alignment toward dynamic capability contingency frameworks (Donaldson, 2015), demonstrating that uncertainty actively determines capability development priorities rather than merely moderating capability-performance relationships. This challenges Rantakari, (2013) characterization of uncertainty inducing organizational paralysis, supporting perspectives positioning volatility as capability development accelerator (Hermundsdottir and Aspelund, 2021).

Table 3: Heterotrait-monotrait ratio analysis

Constructs	Market uncertainty	Supply endurace	Chain	Sustainable advantage	Competitive
Market uncertainty					
Supply chain endurace	0.789				
Sustainable competitive advantage	0.710	0.627			

Table 4: Structural model and hypothesis testing results

Hypothesis		œ	STDEV	T statistic	f-square	P-values	Decision
	Direct effect						
H_1	Market uncertainty -> Supply chain endurace	0.721	0.036	19.944	1.081	0.000	Accepted
H_2	Market uncertainty -> Sustainable competitive advantage	0.405	0.070	5.767	0.129	0.000	Accepted
H_3	Supply chain endurace -> Sustainable competitive advantage	0.265	0.068	3.878	0.055	0.000	Accepted
	Indirect effect					VAF	
H_4	Market uncertainty -> Sustainable competitive advantage	0.191	0.050	3.852		32.04%	

Table 5: Coefficient of determination (R^2)

Constructs	R-square	R-square adjusted
Supply chain endurace	0.519	0.518
Sustainable competitive advantage	0.388	0.385

Table 6: Stone-Geisser predictive relevance (Q^2)

Constructs	SSO	SSE	Q^2 (=1-SSE/SSO)
Market uncertainty	1878.000	1134.769	0.396
Supply chain endurace	2191.000	843.790	0.615
Sustainable competitive advantage	1252.000	763.250	0.390

Table 7: Out-of-sample prediction assessment (Q^2 predict)

Constructs	Q^2 predict	RMSE	MAE
Supply chain endurace	0.512	0.705	0.491
Sustainable competitive advantage	0.341	0.817	0.667

The relationship operates through multiple mechanisms: Demand unpredictability reduces forecast accuracy, compelling buffering capabilities through strategic inventory positioning and flexible production capacity (Nugroho et al., 2010); supply disruption risks from tobacco cultivation seasonality necessitate redundancy investments across supplier tiers (Vakharia and Yenipazarli, 2008); competitive dynamics create first-mover advantages for superior endurance capabilities, generating market share redistributions favoring rapid adaptation (Echefaj et al., 2024); and institutional complexity from regulatory agencies and advocacy organizations demands multidimensional organizational flexibility (Persad et al., 2024). Critically, endogenous regulatory volatility in Indonesian cigarettes differs substantively from exogenous disruptions (Ivanov, 2018), exhibiting greater directional predictability enabling anticipatory rather than purely reactive capabilities. Institutional voids in emerging markets—regulatory enforcement inconsistency and implementation uncertainty across decentralized jurisdictions—amplify uncertainty's impact on capability imperatives (Khanna et al., 2021). This resolves the apparent paradox of aggressive irreversible capability investments under uncertainty: Survival depends on adaptation capacity rather than operational efficiency, fundamentally altering resource allocation logics from avoiding investment losses toward mitigating existential competitive obsolescence threats (Bloom et al., 2012).

5.2. Market Uncertainty as a Double-Edged Competitive Mechanism

The confirmed positive relationship between market uncertainty and sustainable competitive advantage challenges conventional assumptions portraying volatility primarily as performance liability (Porter, 1996), supporting perspectives positioning uncertainty as strategic sorting mechanism amplifying competitive asymmetries between adaptive and inert organizations (Hermundsdottir and Aspelund, 2021). Dynamic capabilities theory explains this paradox: While stable conditions favor incumbents with accumulated assets, regulatory volatility renders existing resource configurations obsolete, creating opportunity windows for firms possessing superior sensing-seizing-reconfiguring capabilities (Barney, 1986a). This aligns with (Schumpeter, 1934) creative destruction—Indonesian excise policy volatility enables rapid product portfolio adjustments toward premium or low-cost segments, achieving competitive gains unavailable under stability (Münster et al., 2018). The moderate effect magnitude suggests critical nuance: Uncertainty functions as multiplicative moderator enhancing capability-performance linkages rather than independent driver. Organizations lacking dynamic capabilities experience uncertainty purely as impediment, while capability-rich firms convert volatility into opportunities—validating resource-based view propositions regarding capability heterogeneity as fundamental competitive advantage source (Barney, 1986b).

The relationship reveals capability-based asymmetries: Large manufacturers possessing comprehensive sensing systems and flexible infrastructures demonstrate superior uncertainty navigation, potentially accelerating market consolidation contrary to policy objectives. Temporal dynamics exhibit path dependence—early capability investments create compounding advantages across subsequent volatility episodes (Arndt and Bach, 2015). The relationship likely exhibits non-linearity: Moderate uncertainty stimulates beneficial adaptation without overwhelming capacity, while extreme volatility may exceed coping capabilities (Teece, 2019). Indonesia's gradual regulatory tightening positions firms within optimal uncertainty range enabling competitive differentiation; more extreme disruptions might reveal threshold effects reversing uncertainty-advantage relationships. Critically, uncertainty fundamentally alters competitive advantage sustainability mechanisms, shifting from static resource position defensibility emphasized in traditional RBV Barney et al., (2021) toward continuous capability renewal dynamics. Competitive advantage sustainability depends on repeatedly sensing shifts, seizing opportunities, and reconfiguring resources across multiple cycles—inherently more difficult to replicate than discrete resource accumulations, establishing capability regeneration speed as primary sustainability determinant under volatility (Herrera, 2015).

5.3. Supply Chain Endurance as Strategic Resource for Competitive Differentiation

The confirmed positive relationship between supply chain endurance and sustainable competitive advantage validates resource-based view propositions positioning operational capabilities as VRIN-satisfying competitive differentiation sources (Amis et al., 2020), challenging perspectives treating supply chain capabilities as commodity resources easily replicated through best practice adoption. Endurance operates through distinct complementary pathways: Operational continuity during disruptions prevents market share erosion competitors suffer, generating customer retention through consistent availability and switching costs persisting beyond disruption periods (Gharaibeh et al., 2024); flexibility dimensions facilitate rapid product portfolio adjustments responding to regulatory changes, converting consumption restriction threats into opportunities through targeted innovations addressing residual permissible contexts (Shima et al., 2018); and disruption avoidance reduces operational costs—emergency procurement premiums, expedited logistics expenses, customer compensation—substantially exceeding prevention investments over time, creating total cost advantages enabling competitive pricing flexibility (Li et al., 2025). Theoretically, endurance constitutes higher-order capability integrating multiple lower-order operational competencies requiring sustained organizational learning, cross-functional coordination transcending departmental boundaries, and trust-based supplier relationship cultivation (Teece, 2019). These development requirements create causal ambiguity—competitors cannot decompose complex capability bundles into replicable components—while path dependence through accumulated experiences and relationship histories impedes temporal compression by late-movers (Barney, 1991).

The finding extends supply chain theory by distinguishing endurance from resilience and agility: While resilience emphasizes disruption recovery (Golgeci and Ponomarov, 2013), endurance encompasses proactive flexibility enabling disruption avoidance alongside reactive mechanisms, proving particularly relevant for persistent rather than episodic uncertainty where organizations continuously navigate volatility rather than “bouncing back” from discrete shocks. This addresses prior research gaps treating capabilities as undifferentiated enablers (Firman et al., 2019), enabling precise strategic guidance prioritizing endurance over pure efficiency under volatility—fundamental reorientation from traditional paradigms emphasizing independent cost leadership or service differentiation. Indonesian cigarette context amplifies endurance’s strategic importance: Tobacco cultivation’s agricultural seasonality creates supply vulnerability manufacturing scheduling cannot eliminate, unlike industries where demand management mitigates fluctuations; regulatory enforcement inconsistency across decentralized governance necessitates flexible distribution accommodating variable regional compliance requirements (Xue, 2014); and consumer preference diversity spanning traditional clove, white, and low-tar cigarettes demands responsive variety-supporting production systems (Brunet, 2019). These industry-specific characteristics collectively elevate endurance from operational necessity to strategic imperative distinguishing competitive success.

5.4. The Mediating Architecture: Partial Transmission through Supply Chain Endurance

The confirmed partial mediation establishes supply chain endurance as crucial yet nonexclusive transmission mechanism linking market uncertainty to sustainable competitive advantage, with endurance explaining approximately one-third of uncertainty’s total effect while substantial direct relationships persist. Dynamic capabilities theory explains this architecture: Market uncertainty activates organizational sensing mechanisms prompting strategic responses through multiple channels (Teece, 2007). One pathway involves supply chain reconfigurations—firms detecting disruption risks develop endurance capabilities buffering threats while positioning organizations for opportunity exploitation, reflecting characteristic sensing-reconfiguring-performing processes. However, sensing simultaneously activates alternative pathways operating independently: Strategic positioning adjustments including market segment reorientation and branding shifts respond directly without supply chain intermediation (Hermundsdottir and Aspelund, 2021); innovation capabilities enabling reduced-harm products or alternative delivery systems generate advantages through R&D capabilities orthogonal to endurance (Huang and Huang, 2020). This aligns with contingency theory emphasizing multidimensional fit—superior competitive performance requires holistic strategic alignments encompassing endurance alongside marketing agility, innovation capacity, financial flexibility, and human resource adaptability (Donaldson, 2015). Supply chain endurance provides necessary but insufficient conditions, suggesting competitive advantage emerges from capability portfolios rather than singular dimensions.

Unmeasured mediators potentially account for residual direct effects: Marketing agility enabling rapid promotional and pricing adjustments (Ingrande and Brodsky, 2013); financial flexibility providing liquidity for opportunistic investments; organizational learning cultivating uncertainty navigation knowledge through repeated adaptations (Fan et al., 2024); and human resource management enabling workforce flexibility through cross-training and adaptive incentives. Temporal dynamics suggest initial uncertainty triggers immediate direct responses—product mix or pricing modifications achievable through managerial discretion without extensive capability development (Yoshikuni et al., 2024) while endurance development requires longer horizons involving supplier cultivation and infrastructure investments, generating gradual sustained operational superiority (Junaid et al., 2023). Cross-sectional designs may underestimate endurance’s long-term value; longitudinal analyses would clarify whether mediation strength evolves through learning curve effects or exhibits non-monotonic trajectories from diminishing returns. Practically, organizations cannot rely exclusively on supply chain reconfigurations—balanced capability portfolios addressing operational continuity, strategic positioning, innovation, and market sensing optimize competitive positioning under multidimensional uncertainty. Theoretically, this demonstrates supply chain capabilities function as context-dependent mechanisms—strategic value amplifies under uncertainty where disruption risks intensify, potentially diminishing under stable environments prioritizing efficiency (Alkhawaldah et al., 2023) enriching understanding of when and how operational capabilities translate into competitive advantages.

6. CONCLUSION

This study empirically validates supply chain endurance as a partial mediating mechanism linking market uncertainty to sustainable competitive advantage within Indonesia's cigarette industry, explaining approximately one-third of uncertainty's total effect. Findings advance dynamic capabilities theory by demonstrating environmental turbulence catalyzes capability development while confirming resource-based view propositions positioning endurance as VRIN-satisfying strategic resource. Empirically, market uncertainty exerts strong influence on supply chain endurance, which subsequently contributes to competitive advantage alongside substantial direct effects. Practically, organizations should prioritize endurance investments encompassing flexibility mechanisms, supplier diversification, and scenario planning capabilities. However, cross-sectional design limits causal inference; future longitudinal research examining disaggregated endurance dimensions, complementary mediating mechanisms, and configurational approaches across industries would strengthen theoretical understanding of uncertainty-capability-performance relationships.

6.1. Theoretical Implications

This study advances dynamic capabilities theory by empirically demonstrating market uncertainty functions as capability development catalyst rather than contextual moderator, validating sensing-seizing reconfiguring mechanisms within emerging markets (Eisenhardt & Martin, 2000; Teece, 2019). Findings enrich resource-based view by positioning supply chain endurance as VRIN-satisfying strategic resource transcending operational efficiency toward sustainable differentiation (Barney et al., 2021; Barney & Hesterly, 2019). The partial mediation structure reveals competitive advantage emergence involves multiple concurrent pathways—supply chain capabilities explaining one-third of uncertainty's total effect alongside direct strategic adaptations—challenging oversimplified linear models. Furthermore, research extends contingency theory by demonstrating environmental characteristics actively shape capability priorities rather than merely moderating performance relationships (Donaldson, 2001), while distinguishing endurance from traditional resilience conceptualizations through proactive flexibility and sustained adaptability dimensions (Ponomarov & Holcomb, 2009).

6.2. Practical Implications

For cigarette industry managers navigating Indonesia's volatile regulatory landscape, findings emphasize supply chain endurance investments as competitive imperatives requiring supplier diversification, inventory flexibility, and scenario planning implementation. Organizations must reconceptualize performance metrics from efficiency optimization toward balanced scorecards incorporating resilience indicators— flexibility responsiveness, disruption recovery speed, and adaptive capacity. Strategic planning should integrate uncertainty scenarios into capability roadmaps, enabling proactive positioning rather than reactive crisis management. Policymakers must recognize that regulatory volatility creates competitive asymmetries favoring resource-rich firms, potentially accelerating industry consolidation. Industry-level collaborative initiatives addressing shared vulnerabilities, technology investments enhancing supply chain visibility, and talent management prioritizing adaptive leadership capabilities provide complementary pathways for endurance development across firm categories, converting uncertainty into sustainable competitive advantage.

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