



“Investigating the mediating role of strategic flexibility on strategic planning and competitive advantage in Yemeni cement companies”

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INVESTIGATING THE MEDIATING ROLE OF STRATEGIC FLEXIBILITY ON STRATEGIC PLANNING AND COMPETITIVE ADVANTAGE IN YEMENI CEMENT COMPANIES

Abstract

This study investigates the interrelationships between strategic planning, strategic flexibility, and competitive advantage in private Yemeni cement companies. It specifically analyzes direct and indirect effects of strategic planning on competitive advantage through strategic flexibility. Data were collected via a questionnaire distributed to 452 managerial and specialist employees in three companies in January 2024 and analyzed using structural equation modeling with SmartPLS3. The findings indicate that strategic planning has a significant direct effect on competitive advantage ($\beta = 0.031-0.227$, $p < 0.001$) through strategic environmental analysis, strategic plan formulation, and strategic plan implementation. Strategic planning also significantly influences strategic flexibility ($\beta = 0.100-0.360$, $p < 0.001$) across all its dimensions. Strategic plan implementation emerges as the most influential on both competitive advantage ($\beta = 0.227$, $p < 0.001$) and strategic flexibility ($\beta = 0.360$, $p < 0.001$). Strategic flexibility directly affects competitive advantage ($\beta = 0.391-0.454$, $p < 0.001$) through the market flexibility, human capital flexibility, and production flexibility, among which production flexibility was the most influential dimension ($\beta = 0.454$, $p < 0.001$). All strategic planning dimensions exert significant indirect effects on competitive advantage mediated by strategic flexibility. The mediation was partial for strategic environmental analysis, strategic plan formulation, and strategic plan implementation ($\beta = 0.050-0.181$, $p < 0.001$), and full for strategic orientation ($\beta = 0.115$, $p < 0.001$). These findings provide managers with evidence-based strategic insights for navigating instability, underscoring that the synergy between planning and flexibility is paramount for achieving a sustainable competitive position in volatile markets.

Keywords

cement industry, competitive advantage, manufacturing, mediation, strategic flexibility, strategic planning, Yemen

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INTRODUCTION

In an era defined by rapid geopolitical, technological, and social shifts, organizations worldwide grapple with unprecedented environmental turbulence that threatens their long-term viability and competitive positioning (Cancino et al., 2018). The resource-based view (RBV) posits that sustained competitive advantage is derived from a firm's unique resources and capabilities (Barney, 1991). To navigate this complexity, transition from reactive problem-solving to proactive, foresight-driven strategic planning is imperative (Beach, 2004; Kharroub & Mansour, 2019). Strategic planning, encompassing strategic environmental analysis, strategic orientation, strategic plan formulation, and strategic plan implementation, serves as a critical mechanism for rational decision-making and sustained performance (St-Hilaire, 2011). Concurrently, strategic flexibility, the capacity to dynamically reallocate resources and adapt strategies, has emerged as a vital intangible asset for building organizational resilience in volatile markets (Brozovic, 2016; Yi et al., 2017).



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While the direct relationship between strategic planning and competitive advantage is well-documented (e.g., Kornelius et al., 2020), the mediating mechanisms that explain this relationship, particularly in highly unstable contexts, remain underexplored. The specific role of strategic flexibility through its dimensions (market, production, and human capital), as a mediator between planning and advantage, is a critical scholarly gap requiring further substantiation. This gap is especially pronounced in developing economies characterized by institutional fragility.

The Yemeni private cement industry exemplifies this turbulent context, having contracted annually by 17% between 2015 and 2020 amid intense competition and operational inefficiencies (Federation of Yemen Chambers of Commerce and Industry, 2021). Within such an unstable environment, firms are increasingly compelled to balance structured strategic planning with a high degree of adaptive flexibility to maintain their viability. This study addresses the interconnected roles of strategic planning, strategic flexibility, and competitive advantage within the Yemeni cement sector, due to the limited empirical evidence available on how firms in such challenging environments leverage strategic processes to sustain competitiveness.

1. LITERATURE REVIEW AND HYPOTHESES

Strategic planning has undergone significant conceptual evolution, reflecting the dynamic nature of organizational and environmental demands. It is a dynamic and iterative process involving long-term planning, which integrates both internal and external variables (Al-Sakarnah, 2015). Organizations utilize this process not only to determine their target markets and competitive approaches, spanning cost efficiency, quality, speed, or flexibility, but also to adapt to annual changes in environmental conditions. As strategic planning has matured, Aldehayyat and Twaissi (2011) highlight its multifaceted role in aligning organizational units, improving employee engagement, identifying future opportunities, and enhancing overall organizational performance. Thus, strategic planning constitutes a structured framework for achieving long-term vitality amidst crises and market uncertainty (Bryson et al., 2017).

In contemporary volatile environments, organizations are compelled to leverage strategic planning's ability to align internal structures with external opportunities dynamically. This perspective is extended by underscoring strategic planning's adaptability to evolving conditions, offering organizations competitive advantages while ensuring alignment between their mission, strategic goals, and environmental uncertainty (Sandada et al., 2014). Collectively, these insights frame strategic planning as an essential tool for modern organizations navigating competitive and rapidly changing conditions, such as the Yemeni cement manufacturing sector.

The systematic studies of strategic planning reveal critical dimensions pivotal to its successful implementation: strategic environmental analysis, strategic orientation, strategic plan formulation, and strategic plan implementation (Maingi et al., 2019; Mousa, 2018). Strategic environmental analysis forms the foundation by thoroughly analyzing external opportunities, threats, and internal strengths and weaknesses, providing actionable insights to guide decisions (Al-Karkhi, 2014). Strategic orientation further builds on this by focusing on an organization's overarching goals, vision, and mission, promoting adaptability and resource optimization (Nasereddin, 2022). Strategic plan formulation translates these insights into actionable strategies that integrate goals across organizational layers (Al-Sakarnah, 2015), while strategic plan implementation operationalizes strategic choices through a structured approach (Nasereddin, 2022).

Empirical studies have consistently demonstrated the links between these dimensions and competitive outcomes. Strategic plan formulation and strategic orientation significantly influence market success (Kornelius et al., 2020). Conversely, certain dimensions, such as internal environmental analysis, may have limited direct contributions to competitive outcomes, suggesting the need to recontextualize these dimensions within a broader operational framework (Al-Tilibani et al., 2012). Together, these dimensions (strategic environmental analysis, strategic orientation, strategic plan formulation, and strategic plan implementation) provide a framework for Yemeni cement firms to navigate competitive and turbulent environments. In parallel with strategic planning,

strategic flexibility emerges as a critical component for resilience in dynamic environments characterized by accelerated change. Strategic flexibility enables organizations to detect external shifts, mobilize resources, and pivot strategies swiftly (Brozovic, 2016). Rooted in strategic management theories, it involves two behavioral approaches: reactive (adapting to environmental changes like market disruptions) and proactive (influencing the external environment such as shaping industry trends) (Slimy & Sebti, 2015). Scholars define strategic flexibility as an organization's capacity to align strategies with environmental fluctuations, adapt to sudden changes, and leverage resources for viability and competitive advantage (Dai et al., 2018; Aref, 2019; Danook, 2021). It hinges on absorbing internal and external disruptions while maintaining operational resilience (Shalender & Yadav, 2019).

Strategic flexibility is inherently multidimensional, including market flexibility, production flexibility, and human capital flexibility. Human capital flexibility refers to the workforce's adaptability through skills, knowledge, and behavioral agility (Bhattacharya et al., 2005). Production flexibility is the capacity to adjust production processes, inventory, and technology to meet demand (Reinartz & Schmid, 2016). Market flexibility is the ability to adapt to market changes (Al-Haraisa, 2018). These dimensions equip organizations to mitigate both external disruptions and internal misalignments efficiently. Furthermore, Yemen's volatile industrial context underscores these principles, as flexibility allows firms to navigate resource constraints and unpredictable market fluctuations (Battour et al., 2021). These dimensions are crucial to strike a balance between cost efficiency, innovation, and workforce responsiveness.

Competitive advantage lacks a singular definition but is broadly conceptualized through outcome-based measures (e.g., superior profitability, cost gaps, financial performance) and source-based determinants (e.g., cost leadership, differentiation, technological capabilities) (Sigalas et al., 2013). It is defined as the sustained pursuit of excellence to achieve superior returns (Chen et al., 2017), while Ali and Anwar (2021) emphasize its ability to create and exploit unique opportunities.

Researchers often conceptualize competitive advantage through dimensions including cost leadership, flexibility, creativity and innovation, quality, financial performance, and delivery (Bore, 2021; Ayedh & Al-Beshari, 2020; Handayani & Karnawati, 2020; Ahmad et al., 2021; Al-Romeedy, 2019; Diab, 2014; Khoshnood & Nematizadeh, 2017; Celadon, 2014). In this study, the dimensions of cost, quality, flexibility, creativity and innovation, and delivery were selected. Delivery ensures timely product availability to meet customer demand (Diab, 2014). Creativity and innovation involve developing unique products, strategies, or systems to capture customer interest (Haghighi et al., 2018). Flexibility refers to adapting processes and products to market changes, such as modifying existing offerings or introducing innovations (Diab, 2014). Quality aligns products with customer expectations at competitive prices (Al-Khalaf & Mehehe, 2019). Cost means producing goods at minimal costs to provide competitive pricing (Awwad et al., 2013). These dimensions enable Yemeni cement firms to navigate competitive pressures through cost efficiency, quality control, and responsive operations.

The integration of strategic planning into competitive advantage frameworks underscores its transformative potential. Structural dimensions of strategic planning, such as strategic orientation and strategic plan formulation, exhibit direct correlations with enhanced competitive outcomes (Kornelius et al., 2020). However, inconsistencies persist, particularly concerning strategic environmental analysis's contributions (Al-Tilibani et al., 2012), indicating the need for nuanced mediatory analyses.

Strategic flexibility plays a crucial moderating and mediating role within this relationship. In dynamic environments, strategic planning must be integrated with flexibility to adapt rapid external changes (Ifandoudas & Chapman, 2009). Strategic flexibility amplifies the adaptability of strategic plans, enabling organizations to realign initiatives rapidly in dynamic markets (Abdal Fattah et al., 2019). The integration of flexibility as an intangible resource is paving the way for competitive superiority (Shalender & Yadav, 2019; Brozovic, 2016). While Ahmed and Mohammed (2019) confirm full mediation of flexibility within strategic planning frameworks, other studies (Al-Zayadi, 2019) observe no mediating role, reflecting potential deficiencies in operationalizing these constructs. Addressing these gaps remains es-

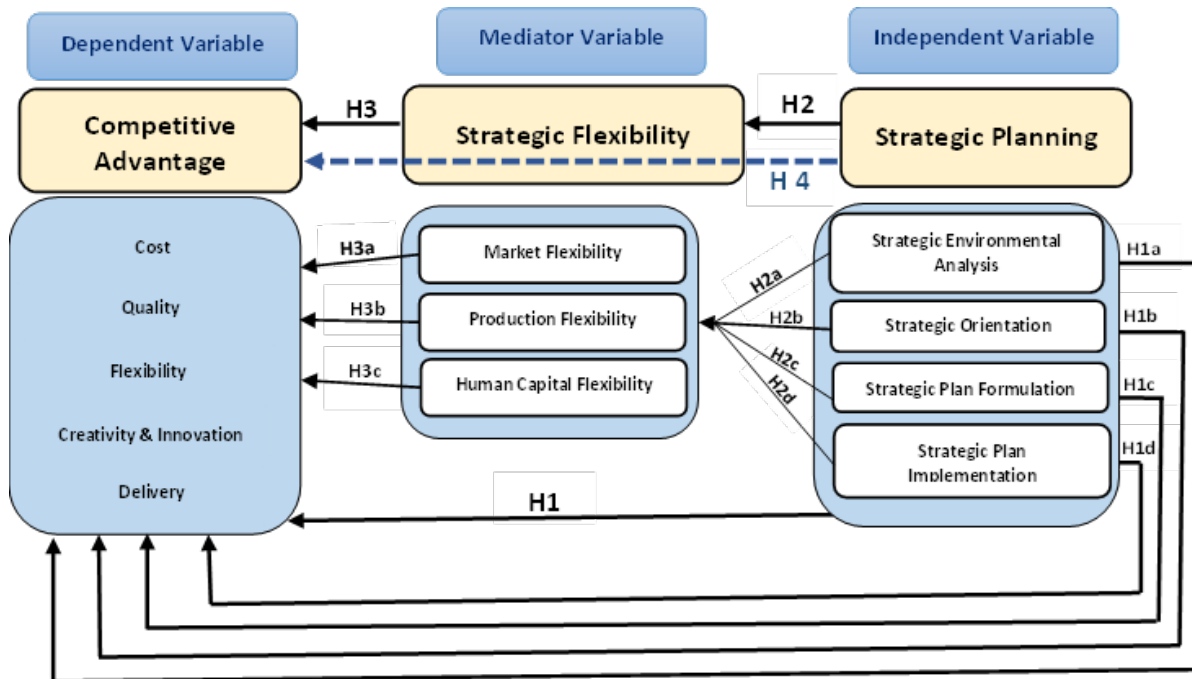


Figure 1. Conceptual model

essential for enhancing the predictive capabilities of strategic planning models. In Yemen's industrial sector, it is critical for viability, allowing firms to neutralize threats and exploit opportunities (Battour et al., 2021).

As an antecedent to competitive advantage, strategic flexibility offers a dynamic hub connecting operational adequacy with market responsiveness in volatile conditions. By fostering innovation and refining organizational alignment, flexibility serves as an adaptive operational advantage. The potential mediating role of strategic flexibility is supported by divergent findings in prior literature, showing full mediation in some contexts (Ahmed & Mohammed, 2019) and partial or no mediation in others (Ayedh & Omar, 2020; Al-Zayadi, 2019). This very empirical variance underscores the critical necessity of investigating this mediating mechanism within the specific high-turbulence context of Yemeni industrial manufacturing, where the synergy between deliberate planning and emergent flexibility transcends mere benefit to become essential for organizational viability.

In summary, this literature establishes strategic planning and strategic flexibility as critical determinants of competitive advantage, particu-

larly in volatile environments. However, a clear gap exists in understanding the precise mediating role of strategic flexibility's dimensions (market, production, human capital) in the relationship between the distinct dimensions of strategic planning (environmental analysis, orientation, formulation, implementation) and competitive advantage within the under-researched, high-risk context of Yemen's private cement industry.

Therefore, the present study aims to investigate the impact of strategic planning on competitive advantage, with a specific focus on the mediating role of strategic flexibility, in private cement manufacturing companies in Yemen. Thus, the study proposes the following hypotheses and conceptual model (Figure 1):

- H1: Strategic planning dimensions (strategic environmental analysis, strategic orientation, strategic plan formulation, and strategic plan implementation) significantly influence competitive advantage.*
- H2: Strategic planning dimensions (strategic environmental analysis, strategic orientation, strategic plan formulation, and strategic*

plan implementation) significantly influence strategic flexibility.

H3: Strategic flexibility dimensions (market flexibility, production flexibility, human capital flexibility) significantly influence competitive advantage.

H4: Strategic flexibility significantly mediates the relationship between strategic planning and competitive advantage.

2. METHODOLOGY

Meaningful insights into strategic-level phenomena are provided (Lavrakas, 2008). The criteria for this study focus on managerial and specialist-level employees from three private cement manufacturing companies in Yemen. A quantitative, descriptive-analytical approach was employed to examine the relationships between strategic planning, strategic flexibility, and competitive advantage. Data were collected using a self-administered questionnaire distributed through an expert sampling design to ensure participants possessed the requisite knowledge to participation required participants to hold senior, middle, or operational management roles such as general manager, deputy general manager, director, head of department, supervisor, and specialist.

This study adhered to the ethical principles of the Declaration of Helsinki (World Medical Association, 2013) and received approval from the Institutional Review Committee (IRC) of the researcher's center (Ref. No.: 000-785; May 13, 2023). Prior to participation, all participants were informed about the research purpose and procedures. They were assured of the confidentiality and anonymity of their responses. Participation was voluntary, and written informed consent was obtained from all individuals involved in the study.

The participants were asked to provide demographic information in the first section of the questionnaire, including gender, age, educational qualification, years of experience, and job position. In the second section, they were

asked to respond to items measuring the study's variables. Data collection was conducted from mid-December 2023 to mid-January 2024. 561 questionnaires were distributed, and 488 were returned. After the screening process, 36 responses were removed due to incompleteness or inconsistent patterns, yielding 452 valid responses for the final analysis (80.6% response rate). To assess the study's hypotheses, the analysis utilized partial least squares structural equation modeling (PLS-SEM) and bootstrapping methodologies. The demographic data of participants are presented in Table 1.

Measurement items were developed from prior literature to ensure reliability and validity. All items were assessed using a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). Specifically, strategic planning was measured using 28 items adapted from Mousa (2018), Kornelius et al. (2020), and Ayedh and Omar (2020), organized across four dimensions. Strategic flexibility was assessed using 21 items adapted from Aref (2019), Ben Ahmed (2017), and Beraha et al. (2018), comprising three dimensions. Competitive advantage was measured using 25 items adapted from Bore (2021), Ayedh and Al-Beshari (2020), and Al-Hababi (2018), distributed across five dimensions. To ensure content validity, a panel of 17 academic experts reviewed the initial questionnaire, and their feedback was incorporated into the final instrument. The complete list of measurement items is provided in Appendix A.

Statistical analysis was conducted using SPSS 20 for exploratory data analysis and SmartPLS3 for Structural Equation Modeling (SEM). The analysis proceeded in two phases using SmartPLS3. First, the measurement model was assessed for convergent validity, evaluating standardized factor loadings, composite reliability, and average variance extracted, and for discriminant validity using the Heterotrait-Monotrait (HTMT) ratio. Second, the structural model was evaluated using path coefficient significance (β), the coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and goodness-of-fit (GoF). Hypothesis testing for direct and mediating effects was conducted using bootstrapped confidence intervals based on 5,000 subsamples.

Table 1. Demographic data of participants (N = 452)

Demographic	Types	Frequency	Percentage (%)
Gender	Male	427	94.50
	Female	25	5.50
Age	<30 years	65	14.38
	30-40 years	182	40.27
	40-50 years	146	32.30
	>50 years	59	13.05
Education	Secondary school	16	3.50
	Post-secondary diploma	45	10.00
	Bachelor's degree	342	75.70
	Master's degree	42	9.30
	Doctoral degree	7	1.50
Experience	<5 years	44	9.73
	5-9 years	118	26.11
	10-14 years	134	29.65
	>15 years	156	34.51
Position	General manager	2	0.40
	Deputy manager	3	0.70
	Director	39	8.60
	Department head	65	14.40
	Supervisor	103	22.80
	Other	240	53.10

3. RESULTS

The results, analyzed using SmartPLS3, elucidate the relationships between strategic planning, strategic flexibility, and competitive advantage in Yemen's private cement manufacturing sector. According to Hair et al. (2019), the evaluation of the measurement model involved an assessment of the construct's validity and reliability. The convergent validity and reliability results are presented in Table 2. The findings indicate that the loading values of the reflective indicators exceeded the recommended threshold of 0.50. The findings indicate that the loading values of the reflective indicators exceeded the recommended threshold of 0.50. The results also indicate acceptable convergent validity, as each construct's Average Variance Extracted (AVE) values were above 0.50. Additionally, the findings validate strong internal consistency reliability for each construct, as indicated by Cronbach's alpha and composite reliability (Rho_A) values exceeding 0.70.

Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio. As shown in Table 3, the results indicate acceptable discriminant validity, as all HTMT values were below the

threshold of 0.85 (Henseler et al., 2015). This confirms that the constructs are distinct from one another.

The validation of the second-order constructs is shown in Table 4. Variance Inflation Factor (VIF) values were all below 5, indicating that collinearity is not a concern (Hair et al., 2022). The outer weights and loadings for most dimensions were significant ($p < 0.05$), except for human capital flexibility and the flexibility dimension of competitive advantage, whose outer weights were non-significant ($p > 0.05$).

The structural model was evaluated for explanatory power, predictive relevance, and goodness-of-fit. To evaluate the in-sample predictive power, the coefficient of determination (R^2) was used. The results show that strategic planning explained 73.9% of the variance in competitive advantage and 67.5% of the variance in strategic flexibility, indicating moderate to substantial explanatory power of the structural model (Table 5). The effect size (f^2) exceeded 0.02, indicating a statistically significant impact. The model's predictive relevance (Q^2) value was 0.305, which suggests moderate predictive accuracy. The model's goodness of fit (GoF) was 0.625, indicating an excellent fit (Wetzels et al., 2009).

Evaluating the structural paths assessed the relationships among the study constructs and their statistical significance. Hypothesis testing was carried out by examining the significance of the path coefficients (β) in the model (Hair et al., 2019). The results presented in Figure 2 and Table 5 demonstrate support for $H2$ ($\beta = 0.360-0.100$, $t = 28.27-9.68$, $p < 0.001$) and $H3$ ($\beta = 0.454-0.391$, $t = 12.37-9.75$, $p < 0.001$), indicating that all dimensions of strategic planning have a significant positive impact on strategic flexibility, and all dimensions of strategic flexibility have a significant positive impact on competitive advantage.

Regarding $H1$, the results indicate that the dimensions of strategic environmental analysis ($\beta = 0.031$, $p < 0.001$), strategic plan formulation ($\beta = 0.066$, $p < 0.001$), and strategic plan implementation ($\beta = 0.227$, $p < 0.001$) have a significant positive impact on competitive advantage. However, strategic orientation ($\beta = 0.020$, $p = 0.073$) does not. Thus, $H1$ is partially supported.

Table 2. Factor loadings, outer weights, reliability, and convergent validity

Constructs	Dimensions	Loadings	Outer weights	α	Rho_A	AVE	
Strategic planning	Strategic environmental analysis	0.66	0.13	0.820	0.834	0.520	
	SEA1	0.749					
	SEA2	0.715					
	SEA3	0.677					
	SEA4	0.692					
	SEA5	0.757					
	SEA6	0.605					
	SEA7	0.459					
	SEA8	0.659					
	Strategic orientation	0.68	0.12	0.835	0.851	0.564	
	SO1	0.685					
	SO2	0.737					
	SO3	0.481					
	SO4	0.744					
	SO5	0.774					
	SO6	0.763					
	SO7	0.759					
	Strategic plan formulation	0.81	0.22	0.850	0.854	0.528	
	SPF1	0.642					
	SPF2	0.666					
	SPF3	0.752					
	SPF4	0.760					
	SPF5	0.813					
	SPF6	0.723					
	SPF7	0.718					
	Strategic plan implementation	0.77	0.19	0.869	0.870	0.560	
	SPI1	0.714					
	SPI2	0.743					
	SPI3	0.773					
	SPI4	0.714					
	SPI5	0.777					
	SPI6	0.722					
	SPI7	0.793					
	Strategic flexibility	Market flexibility	0.81	0.25	0.827	0.891	0.599
		MF1	0.746				
MF2		0.809					
MF3		0.767					
MF4		0.816					
MF5		0.769					
MF6		0.823					
MF7		0.677					
Production flexibility		0.81	0.22	0.875	0.876	0.573	
PF1		0.647					
PF2		0.774					
PF3		0.771					
PF4		0.760					
PF5		0.770					
PF6		0.809					
PF7		0.759					
Human capital flexibility		0.55	0.12	0.829	0.823	0.529	
HCF1		0.685					
HCF2		0.700					
HCF3		0.784					
HCF4		0.747					
HCF5		0.553					
HCF6		0.718					
HCF7		0.709					

Table 2 (cont.). Factor loadings, outer weights, reliability, and convergent validity

Constructs	Dimensions	Loadings	Outer weights	α	Rho_A	AVE
Competitive advantage	Cost	0.64	0.15	0.811	0.811	0.563
	CO1	0.636				
	CO2	0.815				
	CO3	0.806				
	CO4	0.788				
	CO5	0.690				
	Quality	0.81	0.23	0.849	0.852	0.626
	QU1	0.810				
	QU2	0.753				
	QU3	0.762				
	QU4	0.820				
	QU5	0.809				
	Flexibility	0.50	0.10	0.701	0.726	0.645
	FL1	0.783				
	FL2	0.774				
	FL3	0.761				
	FL4	0.501				
	FL5	0.791				
	Creativity and innovation	0.85	0.26	0.882	0.882	0.680
	CI1	0.795				
	CI2	0.805				
	CI3	0.853				
	CI4	0.843				
	CI5	0.826				
	Delivery	0.83	0.22	0.851	0.816	0.641
	DE1	0.748				
	DE2	0.829				
	DE3	0.817				
	DE4	0.788				
	DE5	0.777				

The mediation analysis for *H4* tested the indirect effect of strategic planning on competitive advantage through strategic flexibility. The results, presented in Table 6, revealed a significant indirect effect for all strategic planning dimensions. The mediation was partial for strategic environmen-

tal analysis, strategic plan formulation, and strategic plan implementation, as these dimensions also had a significant direct effect on competitive advantage ($\beta = 0.050-0.181$, $t = 4.962-6.084$, $p < 0.001$). The mediation was full for strategic orientation, as its indirect effect was significant ($\beta =$

Table 3. Discriminant validity (HTMT criterion < 0.85)

	CI	SEA	DE	CO	SO	QU	FL	PF	MF	SPI	HCF	SPF
CI												
SEA	0.633											
DE	0.791	0.626										
CO	0.696	0.581	0.773									
SO	0.689	0.693	0.650	0.563								
QU	0.489	0.369	0.627	0.615	0.542							
FL	0.801	0.657	0.838	0.869	0.666	0.602						
PF	0.695	0.618	0.761	0.642	0.721	0.570	0.754					
MF	0.677	0.654	0.812	0.774	0.750	0.528	0.732	0.775				
SPI	0.756	0.780	0.796	0.728	0.793	0.548	0.795	0.734	0.826			
HCF	0.794	0.640	0.700	0.684	0.642	0.563	0.707	0.722	0.660	0.707		
SPF	0.696	0.724	0.736	0.640	0.840	0.533	0.700	0.742	0.755	0.835	0.704	

Note: CI: Creativity and Innovation; SEA: Strategic Environmental Analysis; DE: Delivery; CO: Cost; SO: Strategic Orientation; QU: Quality; FL: Flexibility; PF: Production Flexibility; MF: Market Flexibility; SPI: Strategic Plan Implementation; HCF: Human Capital Flexibility; SPF: Strategic Plan Formulation.

Table 4. Second-order construct validation

Constructs	Dimensions	VIF	Outer weight	t-statistic	p-value	Outer loading	p-value
SP	SEA	1.5	0.13	3.55	0.000	0.66	0.000
	SO	1.6	0.12	2.10	0.036	0.68	0.036
	SPF	1.2	0.22	6.02	0.000	0.81	0.000
	SPI	1.3	0.19	8.25	0.000	0.77	0.000
SF	MF	1.4	0.25	9.68	0.000	0.81	0.000
	PF	1.1	0.22	7.89	0.000	0.81	0.000
	HCF	1.7	0.12	0.95	0.342	0.55	0.342
CA	CO	1.2	0.15	1.98	0.048	0.64	0.048
	QU	1.3	0.23	10.20	0.000	0.81	0.000
	FL	1.8	0.10	0.65	0.516	0.50	0.516
	CI	1.2	0.26	12.30	0.000	0.85	0.000
	DE	1.4	0.22	9.75	0.000	0.83	0.000

Note: SP: Strategic Planning; SF: Strategic Flexibility; CA: Competitive Advantage; SEA: Strategic Environmental Analysis; SO: Strategic Orientation; SPF: Strategic Plan Formulation; SPI: Strategic Plan Implementation; MF: Market Flexibility; PF: Production Flexibility; HCF: Human Capital Flexibility; CO: Cost; QU: Quality; FL: Flexibility; CI: Creativity and Innovation; DE: Delivery.

Table 5. Correlation between second-order constructs

Hypothesis: path	β	SD	t-value	p-value	R ²	Decision
H1: SP → CA						
SEA → CA	0.031	0.12	3.55	<0.001	0.739	Supported
SO → CA	0.020	0.15	1.80	0.073		Not Supported
SPF → CA	0.066	0.20	6.02	<0.001		Supported
SPI → CA	0.227	0.18	17.52	<0.001		Supported
H2: SP → SF						
SEA → SF	0.100	0.12	9.68	<0.001	0.675	Supported
SO → SF	0.229	0.15	19.21	<0.001		Supported
SPF → SF	0.245	0.20	23.67	<0.001		Supported
SPI → SF	0.360	0.18	28.27	<0.001		Supported
H3: SF → CA						
MF → CA	0.391	0.20	9.75	<0.001	0.739	Supported
PF → CA	0.454	0.18	12.37	<0.001		Supported
HCF → CA	0.402	0.22	11.49	<0.001		Supported

Note: SP: Strategic Planning; SF: Strategic Flexibility; CA: Competitive Advantage; SEA: Strategic Environmental Analysis; SO: Strategic Orientation; SPF: Strategic Plan Formulation; SPI: Strategic Plan Implementation; MF: Market Flexibility; PF: Production Flexibility; HCF: Human Capital Flexibility.

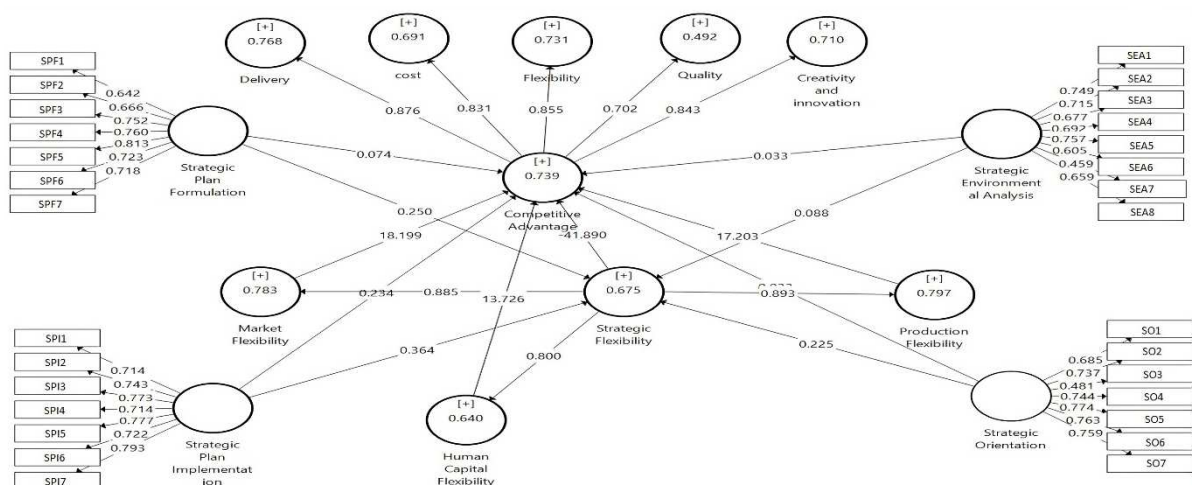


Figure 2. Structural model

Table 6. Mediation analysis of strategic flexibility between strategic planning and competitive advantage

Path	β	t-value	p-value	Percentile bootstrap 95% CI		Effect of mediation
				Lower	Upper	
SEA → SF → CA	0.050	4.962	< 0.001	0.025	0.075	Partial
SO → SF → CA	0.115	6.295	< 0.001	0.080	0.150	Full
SPF → SF → CA	0.123	6.084	< 0.001	0.085	0.160	Partial
SPI → SF → CA	0.181	5.913	< 0.001	0.130	0.230	Partial

Note: SF: Strategic Flexibility; CA: Competitive Advantage; SEA: Strategic Environmental Analysis; SO: Strategic Orientation; SPF: Strategic Plan Formulation; SPI: Strategic Plan Implementation.

0.115, $t = 6.295$, $p < 0.001$), while its direct effect was not (*H1*). Consequently, hypothesis *H4*, which proposed the mediating role of strategic flexibility, is supported.

4. DISCUSSION

The study's findings provide significant insights into the interplay among strategic planning, strategic flexibility, and competitive advantage. Leveraging the lens of partial and full mediation analysis reveals intricate pathways that underscore how these constructs contribute to organizational performance in Yemen's economically and politically volatile context.

This study confirms that strategic planning exerts a substantial positive impact on competitive advantage, validating its long-standing role as a cornerstone of organizational strategy. However, the effect is not equally distributed across its dimensions. Strategic plan implementation emerged as the most influential dimension, explicitly highlighting the pivotal role of actionable measures in Yemen's uncertain environmental and market conditions. This finding aligns with organizational studies of dynamic environments, whereby the implementation of plans acts as a critical stabilizing factor, enabling firms to respond effectively to fluid circumstances and thereby sustain market relevance and achieve performance goals (Kornelius et al., 2020; Mulyaningsih et al., 2021).

Notably, while both strategic environmental analysis and strategic plan formulation dimensions exhibited significant impacts, the effect magnitude was lower than that of implementation. This difference suggests that, while environmental analysis

and formulation provide a valuable foundation, the practical translation of strategic initiatives into operational terms drives competitive outcomes. These findings resonate with the frameworks of contingency theory (Donaldson, 2001), which emphasize environmental adaptation as a factor in strategizing.

Interestingly, strategic orientation showed no direct impact on competitive advantage. This anomaly may be attributed to the inherent responsibilities of strategic orientation typically lying with senior leadership, while the surveyed respondents were predominantly middle and specialized managers. The necessity of bridging organizational layers to ensure strategic alignment emerges as a critical recommendation for fostering competitive dynamics, as also observed in Al-Jafari and Muhammad's (2019) work in the Sudanese pharmaceutical sector.

The second key insight is the significant effect of strategic planning on strategic flexibility. This relationship sharply counters earlier criticisms that formal planning engenders rigidity. Instead, the findings underscore that structured planning processes enable Yemeni firms to develop vital adaptive capabilities. Strategic flexibility, particularly in turbulent settings, is less about freedom from structural constraints and more about effective alignment and responsiveness to market demands.

The implementation and formulation dimensions, followed closely by strategic orientation and environmental analysis, made the highest contributions to strategic flexibility. This pattern reflects that the ability to execute and adjust strategies translates into robust market, production, and human capital adaptiveness. Similar observations arise from the dynamic capabilities framework

(Teece et al., 1997), highlighting that a firm's re-configuration and resource alignment capacity underpins operational flexibility. Alzahrani et al. (2023) further support the notion that such adaptive capabilities can mitigate environmental uncertainties, as confirmed in this sectoral study.

Yemen's economic turbulence underscores the urgency of fostering strategic flexibility, particularly in cement manufacturing, where supply chain interruptions and shifting production priorities are frequent. This finding contributes a strategic imperative: firms must invest in cross-functional competencies and adaptive resource management frameworks to remain resilient.

Strategic flexibility strongly and positively influences competitive advantage, validating its established role as a dynamic capability in volatile scenarios. Among its dimensions, production flexibility had the greatest influence, followed by human capital flexibility and market flexibility. This ranking indicates that Yemen's cement sector primarily leverages production processes and maintains product quality to achieve competitive gains, particularly in responding to fluctuating input supplies and evolving customer demands.

Moreover, the substantial impact of human capital flexibility highlights the importance of training, skills development, and empowerment in enabling workforce responsiveness to environmental shifts. This reflects prior studies such as Ben Ahmed (2017), where organizational agility derived from employee adaptability was cited as a critical factor in sustaining performance despite economic disruptions.

The findings extend research on market flexibility to highlight its relatively lower yet significant impact on competitive advantage. While market

adaptability remains critical, its position may reflect sector-specific determinants where operational factors, like production stability, outweigh variability in customer-driven dynamics. This aspect supports Eryesil et al.'s (2015) assertion that, where market conditions exhibit extreme flux, firms may prioritize upstream flexibility over downstream responsiveness.

The mediating effect of strategic flexibility provides critical insights into how strategic planning translates into competitive advantage. Partial mediation observed in most strategic planning dimensions (e.g., environmental analysis, plan formulation, and implementation) signifies that these components independently affect advantage while simultaneously enhancing flexibility. This dual pathway highlights the non-mutually exclusive roles of direct planning efforts and dynamic responses enabled through flexible architectures. It supports the balanced view of planning and adaptability as complementary in organizational strategy (Mintzberg, 1978).

In contrast, the full mediation effect noted for strategic orientation unpacks its nuanced role. Here, the absence of direct influence underscores the necessity of channeling directional strategies into flexible organizational frameworks for performance realization. This result is particularly meaningful for senior leadership, emphasizing that strategic vision alone is insufficient without enabling mechanisms that adaptively operationalize such orientations across functional systems.

These results confirm the validity of the integrated model, demonstrating that in highly transformative environments like Yemen, the relationship between planning and advantage is effectively activated through the conduit of strategic flexibility (Mohammad et al., 2024).

CONCLUSION

This study examines the intricate relationships between strategic planning, strategic flexibility, and competitive advantage in Yemen's private cement manufacturing sector. By focusing on both the direct and mediated effects of strategic planning through the lens of strategic flexibility, the results revealed that strategic planning significantly impacts competitive advantage. They suggest that companies perceive formal planning as a foundational element for market superiority. Furthermore, strategic planning has a significant and positive impact on strategic flexibility, showing that a structured planning process can

enhance a firm's adaptive capabilities in a turbulent environment. Additionally, the results underscore the essential role of strategic flexibility as a dynamic capability that extends the effectiveness of planning by enabling firms to adapt to volatile environments. Strategic planning indirectly influences competitive advantage through strategic flexibility, emphasizing the mediating role of adaptive capabilities in translating planning efforts into market gains. Based on the results, companies operating in volatile sectors should prioritize the integration of adaptability into their strategic frameworks. This includes investments in fostering organizational flexibility across production processes, market responsiveness, and workforce capabilities. Through this approach, firms can better align strategic intent with environmental demands, enhancing their strategic resilience and competitive sustainability.

This study has several limitations that point to valuable directions for subsequent research. First, the generalizability of the findings is constrained by its cross-sectional design and a sample characterized by respondents from a limited range of age cohorts. Furthermore, the potential for differential mediation effects across generational groups was not a central focus of the analysis. Based on these limitations, longitudinal studies should be conducted to track temporal changes in employees' perceptions of the studied variables. Future research should investigate the mechanism through which strategic orientation enhances competitive advantage, with strategic flexibility tested as a mediating variable.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Measurement items

Axis	Statement	Source(s)
	Dimension 1: Strategic environmental analysis	
	SEA1: The company analyzes the internal environment to identify resource strengths (human, financial, material, etc.) that affect its work.	
	SEA2: The company seeks to identify its weaknesses through internal environment analysis.	
	SEA3: The company analyzes the external environment to identify opportunities in the (economic, political, legislative, social, technological, etc.) aspects that affect its work.	
	SEA4: The company seeks to identify the threats it faces through external environment analysis.	
	SEA5: The company has a clear strategic vision for capitalizing on opportunities and strengths, and reducing threats and weaknesses.	
	SEA6: Environmental analysis helps in developing the company's strategic orientation.	
	SEA7: Environmental analysis helps in determining the appropriate developmental strategies.	
	SEA8: The company's management involves relevant employees in the environmental analysis process.	
	Dimension 2: Strategic Orientation	
Axis one: Strategic planning	SO1: The company has a defined and documented strategic vision.	Mousa (2018), Kornelius et al. (2020), Ayedh and Omar (2020)
	SO2: The company has a clear and documented mission.	
	SO3: The company's mission is understood by all its employees.	
	SO4: The company has specific and documented strategic objectives.	
	SO5: The strategic objectives are consistent with the company's vision and mission.	
	SO6: The company adopts values and principles that govern its activity.	
	SO7: The company develops specific, measurable, achievable, time-bound interim objectives linked to the plan's duration.	
	Dimension 3: Strategic plan formulation	
	SPF1: The company develops appropriate strategies that align with its internal capabilities and the external conditions it faces.	
	SPF2: The company selects strategies in line with its strategic orientation.	
	SPF3: The company has a documented strategic plan.	
	SPF4: The company's top management involves specialized individuals when developing the strategic plan.	
	SPF5: The strategic plan's executive plans include schedules for activities, the time required for their implementation, and their costs.	
	SPF6: The company develops a set of appropriate policies and procedures necessary for implementing the strategic plan.	
	SPF7: The company develops its organizational structure to suit the implementation of its strategic plan.	
	Dimension 4: Strategic plan implementation	
Axis one: Strategic planning	SPI1: The company's management adheres to the steps for implementing the activities identified during the strategic plan's formulation.	Mousa (2018), Kornelius et al. (2020), Ayedh and Omar (2020)
	SPI2: The company adheres to the administrative regulations adopted for strategic plan implementation.	
	SPI3: The company commits to implementing the strategic plan according to the defined organizational structure.	
	SPI4: The company provides the necessary experienced and skilled human resources for strategic plan implementation.	
	SPI5: The company develops the capabilities of its employees in a way that contributes to strategic plan implementation.	
	SPI6: The company provides the necessary funds for strategic plan implementation.	
	SPI7: The company adheres to the specified timeframe for implementing the proposed activities.	

Table A1 (cont.). Measurement items

Axis	Statement	Source(s)
Axis two: Strategic flexibility	Dimension 1: Market flexibility	Aref (2019), Ben Ahmed (2017), Beraha et al. (2018)
	MF1: The company seeks to increase sales volume through the markets it deals with.	
	MF2: The company always looks for opportunities in new markets.	
	MF3: The company offers diverse marketing promotions/offers seeking to outperform its competitors.	
	MF4: The company can respond to customer requests quickly.	
	MF5: The company conducts in-depth marketing studies about the markets it aims to enter.	
	MF6: The company uses new methods in presenting its products to customers.	
	MF7: The company utilizes feedback from its customers in developing its products.	
	Dimension 2: Production flexibility	
	PF1: The company works on modifying the characteristics of current products according to market needs.	
	PF2: The company is concerned with acquiring the latest machinery and equipment to improve the quality of its products.	
	PF3: The company's management is concerned with adjusting the level of production capacity to meet market demands.	
	PF4: The company always works on improving production methods to distinguish its products from competitors.	
	PF5: The company uses advanced production techniques compared to competitors.	
	PF6: The company possesses the appropriate resources that enable it to adapt to changing environmental conditions.	
	PF7: The company possesses diverse resources that enable it to produce products different from competitors.	
	Dimension 3: Human capital flexibility	
	HCF1: The company works on training employees to obtain distinguished skills.	
	HCF2: The company adjusts working hours to match work needs.	
	HCF3: The company's management works on motivating employees to execute the tasks assigned to them effectively.	
	HCF4: The company's employees are distinguished by their ability to adapt to emergency situations.	
HCF5: The company's employees possess the ability to perform diverse tasks with the same efficiency.		
HCF6: Employees exert great efforts to meet work needs.		
HCF7: Employees in the company take the initiative to identify the causes of problems when errors occur in the work.		
Axis three: Competitive advantage	Dimension 1: Cost	Bore (2021), Ayedh and Al-Beshari (2020), Al-Hababi (2018)
	CO1: The company produces its products at the lowest cost compared to competitors.	
	CO2: The company has the ability to exploit available resources in economical ways.	
	CO3: The company develops innovative methods and techniques that ensure cost reduction.	
	CO4: The company seeks to reduce inventory costs.	
	CO5: The company is keen on reducing the rate of spoilage (defect) in its products compared to competitors.	
	Dimension 2: Quality	
	QU1: The company has a dedicated team for quality and continuous improvement.	
	QU2: The company's products are characterized by features that meet customer needs.	
	QU3: The company's products conform to international quality specifications and standards.	
	QU4: The company has the required devices and equipment for measuring and ensuring quality.	
	QU5: The company has modern methods for improving quality.	

Table A1 (cont.). Measurement items

Axis	Statement	Source(s)
Axis three: Competitive advantage	Dimension 3: Flexibility	Bore (2021), Ayedh and Al-Beshari (2020), Al-Hababi (2018)
	FL1: The company has a mechanism that ensures quick response to market needs.	
	FL2: The company has high flexibility in controlling its product specifications to suit the volume of supply and demand.	
	FL3: The company adopts strategies capable of developing and distinguishing the efficiency of its production processes.	
	FL4: The company's employees possess multiple skills that enable them to perform more than one job or task.	
	FL5: The plans followed by the company are characterized by flexibility to face environmental changes.	
	Dimension 4: Creativity and innovation	
	CI1: The company has the ability to present ideas that enhance its position in the market.	
	CI2: The company encourages new, innovative ideas presented by employees.	
	CI3: The company has an effective unit specialized in Research and Development (R&D) affairs.	
	CI4: The company allocates the necessary financial resources to secure opportunities for creativity and innovation.	
	CI5: The company is always keen on adopting new ideas contained in market research.	
	Dimension 5: Delivery	
	DE1: The company seeks to deliver its products to the customer on time.	
	DE2: The company meets market demands for products with the required speed.	
	DE3: The company develops modern methods for the delivery process according to customer expectations.	
	DE4: The company adopts a safety stock policy to ensure quick response to customer requests.	
	DE5: The company is concerned with quickly fulfilling the delivery of urgent orders.	