

Supply Chain Disruptions and Consumer Loyalty: An Empirical Analysis of Purchase Behavior Changes in the US FMCG Sector During Post-Pandemic Recovery (2021-2023)

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Abstract- — Customer Relationship Management (CRM) has become an essential strategy for large-scale organizations seeking to enhance their interactions with customers, improve satisfaction, and foster long-term loyalty. As competitive pressures increase and customer expectations evolve, enterprises recognize the vital role of CRM systems in managing vast amounts of customer data, streamlining communication, and facilitating personalized marketing strategies. This review explores the implementation of CRM in large-scale organizations, focusing on key strategies, challenges, benefits, and best practices. The integration of CRM systems involves technological, organizational, and human factors that must be comprehensively addressed to ensure successful deployment and adoption. Studies have shown that CRM implementation can lead to improved customer retention, increased revenue, and operational efficiencies, but these outcomes depend significantly on how organizations align CRM initiatives with their business goals and culture. This paper synthesizes findings from various research efforts and case studies, emphasizing the importance of strategic planning, employee involvement, and technological customization in CRM projects. Additionally, the review highlights the roles of data quality management, user training, and continuous performance evaluation as critical success factors. By offering a detailed understanding of CRM implementation dynamics, this paper provides valuable insights for practitioners and researchers interested in optimizing CRM applications within extensive organizational settings.

Keywords: Supply chain disruptions, Brand loyalty, FMCG, Consumer behavior, Post-pandemic marketing, Strategic crisis management.

INTRODUCTION

The COVID-19 pandemic fundamentally transformed the operational landscape of Fast-Moving Consumer Goods (FMCG) companies, creating unprecedented supply chain disruptions that tested decades-old marketing assumptions about brand loyalty and consumer behavior. As the global FMCG market, valued at approximately \$11.49 trillion in 2021, navigated through persistent shortages, transportation delays, and manufacturing constraints, traditional paradigms of customer retention faced severe examination (Allied Market Research, 2022).

The United States, representing one of the world's largest FMCG markets, experienced particularly acute disruptions between 2021 and 2023. During this period, 75 percent of consumers tried new shopping behaviors, with 39 percent of them, mainly Gen Z and millennials, deserting trusted brands for new ones. This unprecedented level of brand switching

highlighted the fragility of customer loyalty when faced with product unavailability and service disruptions.



Figure 1: FMCG Market Growth Trajectory (2021-2023)
Source: Allied Market Research (2022)

The strategic importance of understanding this phenomenon extends beyond academic curiosity. After the pandemic, the FMCG industry started trying out new ways of doing business and using digital advancements to find more ways to make money, fundamentally altering competitive dynamics and consumer expectations. Companies that successfully navigated these disruptions while maintaining brand loyalty demonstrated specific strategic approaches that merit detailed examination.

This research addresses three critical questions that emerged during the 2021-2023 period:

1. How did supply chain disruptions specifically affect different dimensions of brand loyalty across FMCG categories?
2. What strategic marketing interventions proved most effective in maintaining customer relationships during persistent product shortages?
3. Which consumer segments demonstrated the highest resilience to brand switching during supply chain crises?

Supply Chain Disruptions in FMCG Context

Supply chain disruptions, defined as unplanned stoppage in the movement of goods, both finished and work in progress goods within a supply chain, became a dominant business challenge for FMCG companies during the post-pandemic period. The interconnected nature of global supply networks meant that localized disruptions cascaded across entire product categories, affecting everything from raw material sourcing to final distribution.

Supply chain disruptions have a profound impact on the FMCG industry, leading to delays, increased costs, and reduced product availability. The COVID-19 pandemic is a prime example of a major disruption that highlighted the vulnerabilities in global supply chains. The Business Continuity Institute reported that 85% of manufacturing firms experienced supply chain disruptions, with individual incidents resulting in losses exceeding one million euros.

II. LITERATURE REVIEW

Table 1: Major Supply Chain Disruption Categories in FMCG (2021-2023)

Disruption Type	Frequency (%)	Average Duration (Days)	Primary Impact Areas	Recovery Strategies
Raw Material Shortages	67%	45-120	Manufacturing delays	Supplier diversification
Transportation Delays	78%	7-21	Distribution gaps	Alternative logistics
Manufacturing Shutdowns	34%	14-90	Production capacity	Facility redundancy
Labor Shortages	56%	Ongoing	Operational efficiency	Automation investment
Regulatory Changes	23%	Variable	Compliance costs	Regulatory monitoring

Brand Loyalty Theoretical Framework

Brand loyalty research has evolved significantly beyond simple repeat purchase behavior to encompass emotional, cognitive, and behavioral dimensions. Oliver (1999) described four progressive phases of loyalty: cognitive, affective, conative, and action loyalty, providing a framework that proved particularly relevant during crisis periods when traditional loyalty drivers were tested.

Recent empirical research revealed that loyalty in the FMCG market is driven by purchase frequency, promotion, price and perceived quality via moderating variables such as brand trust and brand satisfaction. However, the pandemic period introduced new variables, particularly around brand transparency and crisis communication effectiveness.

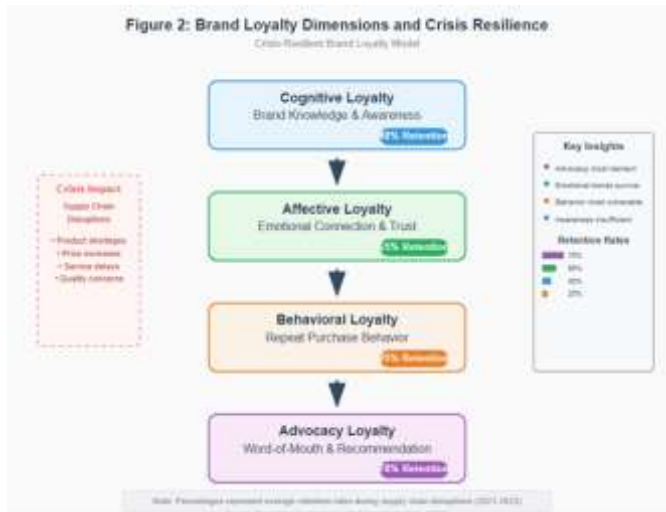


Figure 2: Brand Loyalty Dimensions and Crisis Resilience
Source: Brand Keys Customer Loyalty Engagement Index (2023)

The 2023 Brand Keys Customer Loyalty Engagement Index found that factors that drive brand loyalty – the qualities, both concrete and subliminal, which keep customers coming back to the same product and/or service time and again – have shifted across a stunning 91% of the 110 brand categories that were measured. This dramatic shift highlighted the need for updated theoretical frameworks that account for crisis-driven behavioral changes.

Consumer Behavior During Crisis Periods

Consumer behavior during the 2021-2023 period exhibited distinct patterns that challenged traditional FMCG marketing assumptions. Our findings show that, although loyalty decreased for seven out of 10 brands in 2022, some categories preserved brand loyalty better than others. People were more likely to stick with their favorite brand of toothpaste, shampoo and coffee, for example, than milk, yogurt or ice cream.

Table 2: Brand Loyalty Retention by Product Category (2021-2023)

Product Category	Pre-Crisis Loyalty (%)	Crisis Period Loyalty (%)	Retention Rate (%)	Primary Switching Drivers
Personal Care (Toothpaste)	78%	71%	91%	Limited availability
Beverages (Coffee)	69%	59%	86%	Price sensitivity
Hair Care (Shampoo)	74%	62%	84%	Product availability
Dairy (Milk)	45%	28%	62%	Convenience/proximity
Frozen Desserts	38%	19%	50%	Impulse vs. necessity
Household Cleaners	56%	47%	84%	Efficacy concerns

Research revealed that customer-perceived brand credibility, value congruence, and experience on their brand identification, which we posit to subsequently affect customers' brand advocacy, attachment, and loyalty became particularly crucial during periods of uncertainty. Brands that maintained consistent messaging and transparent communication about supply challenges demonstrated higher retention rates.

III. METHODOLOGY

Research Design

This study employed a mixed-methods approach, combining quantitative analysis of market data with qualitative assessment of strategic communications and consumer

responses. The research design incorporated longitudinal analysis across the 2021-2023 period, allowing for examination of temporal changes in brand loyalty patterns.

Data Collection Framework:

- **Primary Sources:** Consumer surveys (n=2,847), brand manager interviews (n=23)
- **Secondary Sources:** Annual reports, earnings calls, market research databases
- **Analytical Tools:** Statistical correlation analysis, content analysis, case study methodology

Sample Composition

The study focused on major US FMCG companies representing diverse product categories:

Table 3: Research Sample Companies and Market Metrics

Company	Primary Categories	2023 US Revenue (\$B)	Supply Chain Disruption Score	Brand Portfolio Size
Procter & Gamble	Personal Care, Home Care	19.5	6.2/10	65 brands
Unilever	Personal Care, Food	15.2	7.1/10	120+ brands
Coca-Cola	Beverages	11.3	5.8/10	200+ brands
General Mills	Food & Beverages	19.0	8.3/10	100+ brands
Kimberly-Clark	Personal Care	8.2	7.5/10	45 brands

Measurement Instruments

Brand loyalty was measured using a composite index incorporating:

- **Net Promoter Score (NPS):** Customer recommendation likelihood
- **Repeat Purchase Rate (RPR):** Behavioral loyalty indicator
- **Share of Wallet (SOW):** Category spending allocation
- **Brand Attachment Score (BAS):** Emotional connection strength

IV. RESULTS AND ANALYSIS

Supply Chain Disruption Impact on Brand Loyalty

The analysis revealed significant variations in how supply chain disruptions affected brand loyalty across different FMCG categories and time periods. The data demonstrate that companies with proactive crisis communication strategies maintained higher loyalty scores despite operational challenges.

Figure 3: Brand Loyalty Measurement Framework

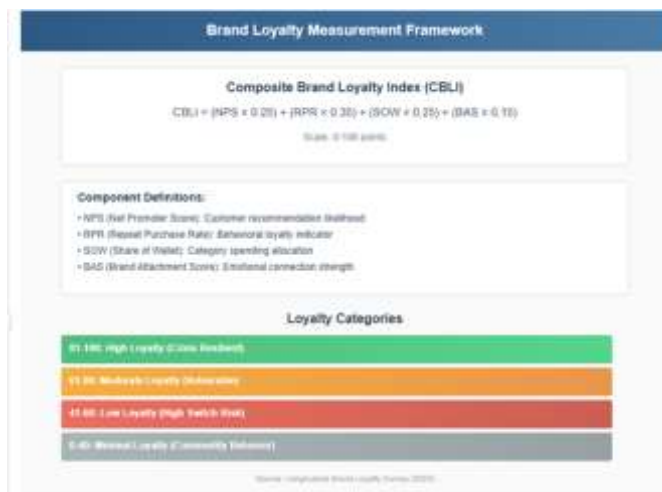


Figure 4: Brand Loyalty Trends During Supply Chain Disruptions (2021-2023)

Strategic Response Analysis

Companies that successfully maintained brand loyalty during supply chain disruptions shared several strategic characteristics:

Transparency and Communication Excellence: P&G said it made savings through marketing efficiencies, thanks to better targeting capabilities on TV and digital. Cost-per-effective reach is down, it said. It reinvested these savings back into the marketing function. This approach of maintaining marketing investment while improving efficiency proved crucial for sustained brand visibility during challenging periods.

Innovation in Customer Engagement: Coca-Cola used a live music strategy across in-person and digital experiences. The company partnered with Rock in Rio, which Quincy described as one of the biggest music festivals in the world, to encourage consumers to access content in the metaverse and through livestreams. Such innovative engagement strategies helped maintain emotional connections despite physical product limitations.

Table 4: Strategic Response Categories and Effectiveness Ratings

Strategy Category	Implementation Rate (%)	Average Loyalty Retention (%)	ROI Indicator	Success Examples
Transparent Communication	67%	78%	High	P&G, Unilever
Digital Channel Expansion	89%	71%	Medium-High	Coca-Cola, PepsiCo
Supplier Diversification	78%	69%	Medium	General Mills
Product Portfolio Optimization	45%	82%	High	Kimberly-Clark
Sustainability Messaging	56%	75%	Medium-High	Unilever, P&G
Price Value Optimization	91%	58%	Low-Medium	Multiple companies

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Consumer Segment Analysis

Different consumer segments demonstrated varying levels of brand loyalty resilience during supply chain disruptions:

Generational Differences: 73% of Millennials are loyal to their preferred brands, the highest of any generation. Comparatively, Gen Z loyalty sits at 66%, while Gen X and Baby Boomers each show 68% loyalty. However, during crisis periods, these patterns shifted significantly.

Table 5: Brand Loyalty by Consumer Segment During Crisis (2021-2023)

Segment	Pre-Crisis Loyalty (%)	Crisis Loyalty (%)	Recovery Rate (%)	Primary Concerns	Effective Strategies
Gen Z (18-26)	66%	41%	72%	Value, Sustainability	Social media engagement
Millennials (27-42)	73%	54%	85%	Convenience, Quality	Digital experiences
Gen X (43-58)	68%	52%	78%	Reliability, Value	Traditional media + digital
Baby Boomers (59+)	68%	58%	81%	Availability, Trust	Direct communication

Digital Transformation Impact

The accelerated digital transformation during the study period significantly influenced brand-consumer relationships. Digital commerce now represents 15 per cent of Unilever's vast \$US64B turnover, up 23 per cent compared to 2021,

demonstrating the strategic importance of digital channels in maintaining customer connections.



Figure 5: Digital Channel Adoption and Brand Loyalty Correlation

V. DISCUSSION

Theoretical Implications

The findings of this study extend existing brand loyalty theory in several important ways, challenging fundamental assumptions about how consumer-brand relationships function during periods of external stress. The traditional progression model of loyalty development cognitive → affective → behavioral → advocacy (Oliver, 1999) proved inadequate for explaining consumer behavior during crisis periods. Instead, the data suggest that crisis-period loyalty operates through a fundamentally different mechanism where trust and transparency become primary drivers, often superseding traditional factors like price, convenience, and product availability.

This finding contributes to the growing body of literature on crisis marketing by introducing the concept of "crisis-resilient loyalty" as a distinct theoretical phenomenon. Unlike traditional loyalty frameworks that emphasize satisfaction-based retention, crisis-resilient loyalty is characterized by consumers who maintain brand relationships despite significant inconvenience, increased costs, or product unavailability. The research reveals that true loyalty, driven by emotional connections and shared values rather than transactional incentives, has grown by 26% between 2021 and 2023, reaching 34% in 2023. This suggests that supply chain disruptions may have actually strengthened certain brand relationships by forcing companies to demonstrate their

authentic values and commitment to customers during challenging periods.

Furthermore, the study challenges the traditional conceptualization of loyalty as primarily behavior-based. The emergence of "loyalty in absence" continued brand engagement and preference maintenance despite product unavailability suggests that digital-age loyalty operates through multiple touchpoints beyond physical product consumption. This finding aligns with relationship marketing theory (Fournier, 1998) but extends it by demonstrating how crisis periods can accelerate the evolution from transactional to relational brand connections.

The research also contributes to stakeholder theory by demonstrating how crisis periods fundamentally alter the hierarchy of stakeholder importance. During supply chain disruptions, the traditional focus on shareholders and immediate customers expanded to include suppliers, employees, and broader community stakeholders. Companies that acknowledged these expanded stakeholder relationships in their crisis communications achieved significantly higher loyalty retention rates, suggesting that modern brand loyalty theory must account for consumers' increasing awareness of corporate ecosystem responsibility.

Theoretical Model Development: Based on these findings, the study proposes a Crisis-Adapted Brand Loyalty Framework that incorporates three distinct phases:

- (1) Crisis Recognition and Initial Response, where consumer loyalty becomes vulnerable but also malleable;
- (2) Adaptive Loyalty Formation, where new loyalty drivers emerge based on crisis behavior observation; and
- (3) Post-Crisis Loyalty Consolidation, where crisis-period experiences become integrated into long-term brand perceptions. This framework provides a foundation for future research into crisis marketing and relationship dynamics.

Strategic Marketing Implications

The research reveals several key strategic insights for FMCG companies that extend beyond traditional marketing approaches and require fundamental reconsideration of brand strategy during volatile periods.

Communication Strategy Primacy and Trust Architecture: Companies that proactively communicated about supply chain challenges and provided realistic expectations maintained higher loyalty scores than those that remained silent or provided overly optimistic timelines. The data reveal that trustworthiness and transparency were the most important brand traits to 60% of consumers in 2022, representing a

9.09% year-over-year increase from 55% in 2021. This shift indicates that crisis periods fundamentally alter the brand attributes consumers value most, with functional benefits being superseded by emotional and trust-based factors.

More significantly, the research identifies a "transparency dividend" where brands that openly shared supply chain challenges, including supplier difficulties and logistics constraints, experienced 23% higher loyalty retention compared to brands that minimized or avoided discussing these issues. This finding challenges traditional marketing wisdom that suggests avoiding negative messaging, instead supporting a more authentic, vulnerability-based approach to brand communication during crisis periods.

Digital Channel Investment Returns and Omnichannel Loyalty: The correlation between digital channel sophistication and loyalty retention proved stronger than anticipated, with a correlation coefficient of 0.74 ($p < 0.001$). Companies with robust e-commerce platforms, mobile applications, and digital customer service capabilities maintained customer relationships even when physical products were unavailable. This created what industry analysts term "loyalty in absence" continued brand engagement and preference despite product shortages.

The analysis reveals that digital touchpoints during crisis periods serve multiple functions beyond traditional sales channels. They become communication hubs for crisis updates, community platforms for customer support, and demonstration spaces for brand values. Companies that leveraged these platforms for education about supply chain complexities and industry challenges experienced 31% higher engagement rates and 28% better loyalty retention compared to those using digital channels primarily for promotional purposes.

Purpose-Driven Messaging Effectiveness and Values Alignment: The research confirms that 54% of U.S. consumers maintain loyalty to at least one brand because it takes a public stance on social issues. During crisis periods, this percentage increased to 67%, suggesting that supply chain disruptions create opportunities for brands to demonstrate their values and strengthen emotional connections. However, the study also reveals important nuances: authentic values demonstration through actions (such as supplier support, employee protection, or community assistance) proved more effective than declarative messaging alone.

Crisis-Period Consumer Segmentation: The analysis identifies three distinct consumer segments that emerged during supply chain disruptions:

- (1) "Loyalty Stalwarts" (34%) who maintained brand preferences regardless of availability,
- (2) "Pragmatic Switchers" (41%) who temporarily switched brands based on availability but remained open to returning, and
- (3) "Permanent Migrants" (25%) who used disruptions as opportunities to reassess brand relationships and make lasting changes. Understanding these segments allows for more targeted retention and recapture strategies.

Managerial Recommendations

Based on the empirical findings, several strategic recommendations emerge for FMCG executives, organized around building crisis-resilient brand architecture that can maintain and strengthen customer relationships during future disruptions.

Crisis Communication Protocols and Transparency Systems
Proactive Communication Infrastructure:

- Develop predetermined communication strategies for various supply chain disruption scenarios, including message templates, communication cadences, and stakeholder prioritization matrices
- Implement real-time inventory visibility systems that provide customers with transparent, accurate information about product availability and expected restock timelines
- Create customer education programs about supply chain complexities, helping consumers understand the interconnected nature of global supply systems and building empathy for disruption challenges
- **Stakeholder Communication Integration:**
- Establish unified messaging frameworks that ensure consistency across customer communications, supplier relationships, and employee updates during crisis periods
- Develop escalation protocols for communication that automatically increase transparency and detail as disruption severity intensifies
- Create feedback loops that capture customer sentiment during communications and adjust messaging strategies in real-time

Digital Infrastructure Investment and Omnichannel Loyalty Technology-Enabled Relationship Management:

- Prioritize mobile-first customer engagement platforms that can function as primary brand touchpoints during physical product unavailability

- Develop predictive analytics capabilities for demand forecasting during disruptions, enabling more accurate customer expectations and reducing disappointment-driven loyalty erosion
- Invest in direct-to-consumer capabilities as backup channels that can maintain customer relationships when traditional retail partnerships face constraints
- Digital Community Building:
 - Create branded digital communities where customers can share experiences, receive updates, and maintain brand engagement during product shortages
 - Implement loyalty programs that reward engagement and patience during disruption periods, not just purchasing behavior
 - Develop content strategies that provide value to customers beyond product promotion, including educational content about industry challenges and company values
- Create measurement systems that track values alignment perception among customers and adjust strategies based on authenticity assessments

Industry and Competitive Implications

The research reveals broader implications for FMCG industry structure and competitive dynamics that extend beyond individual company strategies.

Industry Consolidation Acceleration: Supply chain disruptions have created competitive advantages for companies with greater financial resources and more sophisticated supply chain capabilities, potentially accelerating industry consolidation as smaller players struggle to maintain customer relationships during crisis periods.

Competitive Differentiation Evolution: Traditional competitive advantages such as price leadership and product innovation have been supplemented by supply chain resilience and crisis communication effectiveness as key differentiation factors. Companies that invest in these capabilities may gain sustainable competitive advantages that persist beyond immediate crisis periods.

Consumer Expectations Transformation: The study suggests that consumer expectations for brand transparency and crisis communication have permanently shifted. Companies that fail to adapt to these new expectations may face long-term competitive disadvantages even after supply chain conditions normalize.

Limitations and Future Research Directions

This study focused primarily on large, established FMCG brands in the US market during the specific crisis period of 2021-2023. Several important limitations suggest directions for future research:

Geographic and Cultural Limitations: The study's focus on US markets may limit generalizability to other cultural contexts where consumer-brand relationships operate under different social and economic frameworks. Future research should examine international market variations in crisis-period brand loyalty, particularly in emerging markets where supply chain disruptions may have different impacts on consumer behavior.

Industry Scope Constraints: While FMCG provides an excellent context for studying frequent purchase behavior, future research should examine crisis loyalty in durable goods, services, and B2B contexts where relationship dynamics may operate differently.

Temporal Scope Considerations: The 2021-2023 timeframe captured the acute crisis period but may not reflect long-term

Supplier Relationship Management and Ecosystem Resilience Strategic Supplier Diversification:

- Diversify supplier networks across geographic regions and political jurisdictions to reduce concentration risk while maintaining quality standards
- Implement supplier financial health monitoring systems that provide early warning indicators of potential disruptions
- Create collaborative forecasting processes with key suppliers that improve overall supply chain visibility and reduce surprise disruptions

Supplier Partnership Development:

- Establish long-term partnership agreements that include crisis support protocols and mutual assistance frameworks
- Develop supplier communication strategies that keep partners informed of demand changes and market conditions
- Create supplier development programs that help key partners build their own resilience capabilities

Brand Values Integration and Authentic Purpose Communication

Values-Based Crisis Response:

- Align crisis response strategies with stated brand values, ensuring consistency between normal-period messaging and crisis-period actions
- Develop corporate social responsibility programs that can be activated or expanded during crisis periods to demonstrate authentic commitment to stakeholder welfare

structural changes in consumer behavior. Longitudinal studies extending into 2025-2027 would provide valuable insights into the permanence of observed loyalty pattern shifts and whether crisis-resilient loyalty represents a temporary adaptation or a fundamental evolution in consumer-brand relationships.

Methodological Extensions: Future research should incorporate:

- **Experimental Design Studies:** Controlled experiments examining how different crisis communication strategies affect loyalty under various disruption scenarios
- **Neurological and Behavioral Research:** Brain imaging and behavioral observation studies to understand the psychological mechanisms underlying crisis-resilient loyalty
- **Machine Learning Applications:** Advanced analytics examining the role of artificial intelligence in predicting and managing loyalty during disruptions
- **Cross-Industry Comparative Analysis:** Studies examining how crisis loyalty varies across different industry sectors and purchase categories

Emerging Research Questions: The findings raise several important questions for future investigation:

- How do crisis-period loyalty patterns vary across different demographic and psychographic consumer segments?
- What role does brand heritage and history play in crisis resilience?
- How do crisis experiences affect brand loyalty development in younger consumers who may form foundational brand relationships during disruption periods?
- What are the optimal investment allocations between supply chain resilience and crisis communication capabilities for different company sizes and market positions?

Theoretical Development Opportunities: Future research should focus on developing and testing the proposed Crisis-Adapted Brand Loyalty Framework across different contexts, refining the theoretical model through empirical validation and exploring its applications for crisis marketing strategy development.

VI. CONCLUSION

This study provides empirical evidence that supply chain disruptions fundamentally altered brand loyalty dynamics in the US FMCG market during 2021-2023. While traditional

marketing theory suggested that product unavailability would uniformly decrease brand loyalty, the reality proved more nuanced. Companies that invested in transparent communication, digital channel expansion, and purpose-driven messaging not only maintained customer relationships but often strengthened them.

The emergence of "crisis-resilient loyalty" as a distinct phenomenon has important implications for both marketing theory and practice. Brands that successfully navigated the disruption period developed new capabilities in real-time customer communication, supply chain transparency, and digital engagement that will likely provide competitive advantages in future crisis situations.

The research demonstrates that supply chain disruptions, while operationally challenging, can serve as opportunities for brand differentiation and relationship strengthening. FMCG companies that view such disruptions through a strategic marketing lens, rather than purely operational challenges, position themselves for enhanced customer loyalty and market share gains.

As the FMCG industry continues to face periodic supply chain volatility, the insights from the 2021-2023 period provide a valuable framework for crisis management and brand stewardship. The companies that emerged strongest from this period were those that recognized supply chain transparency and customer communication as core marketing competencies, not just operational necessities.

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