Price Game in Online Shopping: Analysis of Consumer Behavior in the Double Eleven Promotions

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Abstract: This study examines the pricing dynamics and consumer behavior during China's "Double Eleven" shopping festival, focusing on the Taobao platform. As the world's largest online shopping event, Double Eleven serves as a prime example of the intense price competition and strategic interactions between sellers, buyers, and the platform. The research highlights the festival's economic significance, surpassing major Western shopping events. Combining price tracking and consumer data, this study uncovers systemic tensions between platform-driven growth and market fairness. Through a case study of Taobao's 2023 promotions, the paper reveals critical issues such as deceptive pricing practices, market distortion favoring large brands, and algorithmic control that erodes consumer trust and SME profitability. The analysis identifies underlying problems, including information asymmetry, short-termism in pricing strategies, and regulatory gaps in algorithmic governance. These issues collectively undermine market fairness and long-term platform credibility. To address these challenges, the study proposes actionable solutions: enhancing pricing transparency through historical price displays and simplified rules, rebalancing competition for SMEs via dedicated traffic allocation, and establishing ethical algorithmic frameworks. The findings underscore the importance of fostering a fair and sustainable e-commerce ecosystem, offering practical insights for platforms, merchants, and policymakers. The study advances the literature on algorithmic transparency in e-commerce while providing policy recommendations for emerging markets.

1 INTRODUCTION

1.1 Research Background

In recent years, online shopping has become an integral part of global consumer behavior, with e-commerce platforms experiencing exponential growth. Among the various shopping events, China's "Double Eleven" (Singles' Day) shopping festival, initiated by Alibaba in 2009, has emerged as the world's largest online shopping event. In 2022, Alibaba's Tmall and Taobao platforms alone generated a record-breaking 84.54 billion in gross merchandise volume (GMV) during the 24-hour period of Double Eleven, showcasing the immense scale and economic impact of this event. This data surpassed the combined GMV of Black Friday and Cyber Monday in the same year, highlighting the festival's unparalleled dominance.

This phenomenon is not limited to China; similar shopping festivals, such as Black Friday and Cyber Monday in the United States, have also seen significant growth. In 2022, Cyber Monday online sales reached 11.3 billion in the U.S. alone.

1.2 Literature Review

The "Double 11" shopping festival has evolved into a complex economic and psychological battlefield between retailers and consumers. Huang's analysis reveals that while consumers are initially driven by discounts, psychological triggers (e.g., fear of missing out), and non-rational impulses, their behavior has become more rational over time (Huang, 2025). By 2023, growth slowed significantly due to consumer fatigue, overly complex pricing rules, and broader economic pressures. This shift challenges retailers' traditional reliance on price discrimination

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and bundling strategies as trust in promotional tactics declines.

From an economic perspective, Tan explains the festival's initial success through classic theories: incentives stimulate demand, price elasticity drives volume for discount-sensitive goods, and game theory frames the strategic interplay between buyers and sellers (Tan, 2017). However, the globalization of "Double 11" has introduced new challenges, including deceptive practices (e.g., fake discounts), resource waste from impulse buying, and intensified competition with offline retail. Tan argues that long-term sustainability hinges on stricter regulation and rebuilding consumer trust.

Wang's game theory lens further unpacks retailers' dilemmas (Wang, 2016). Sellers are trapped in a Nash equilibrium of price wars, where short-term competition undermines collective profitability. To escape this "prisoner's dilemma," Wang proposes three solutions: (1)developing core competitiveness (e.g., brand value, product differentiation), (2) forming strategic alliances to avoid cutthroat competition, and (3) collaborating with regulators to ensure fair market practices.

Chen's survey of young consumers (e.g., high school students) confirms this paradigm shift (Chen, 2017). Younger buyers increasingly prioritize quality and authenticity over discounts, signaling that pure price-based strategies are losing effectiveness. Retailers must innovate beyond discounts, focusing on service quality, transparency, and personalized experiences to retain this demographic.

While these studies provide valuable insights, their methodologies predominantly rely on survey data and theoretical modeling, lacking empirical analysis of real-time pricing data flows within platforms.

1.3 Research Gap

Despite extensive examination of macro-level dynamics (e.g., Huang's psychological analysis and Wang's game theory models), three critical micro-level blind spots persist. However, few scholars have examined the micro-level pricing mechanisms within specific e-commerce platforms like Taobao, particularly how real-time algorithmic pricing and B2C price negotiation mechanisms shape outcomes during mega-shopping events. A critical gap remains in understanding the platform-driven pricing ecosystem—where AI tools, regulatory policies, and consumer tactics collide—and its implications for market fairness and efficiency.

1.4 Research Framework

To address this gap, this study adopts a three-tiered analytical approach: First, it dissects Taobao's pricing ecosystem, analyzing tools like dynamic pricing algorithms and AI-driven promotions that sellers employ during "Double 11". Next, it investigates consumer counterstrategies (e.g., price-tracking extensions, collective bargaining) and their impact on sellers' pricing decisions. Finally, it evaluates regulatory interventions (e.g., transparency policies) and their effectiveness in mitigating issues like algorithmic collusion or deceptive discounts.

By integrating platform technology, behavioral economics, and policy analysis, this framework aims to uncover the hidden rules of Taobao's price game and propose balanced solutions for stakeholders. The following sections will operationalize this framework through case studies of representative product categories.

2 TAOBAO'S DOUBLE ELEVEN PRICING GAME: A MULTILATERAL DYNAMIC COMPETITION CASE

2.1 Background and Participants

Since its inception in 2009, Taobao's Double Eleven has evolved from a single-day promotion to a month-long shopping festival, with the platform acting as both a marketplace and a rule-setter through algorithmic governance.

Taobao "Double Eleven" is a typical multilateral dynamic game scene; the participants include:

Platform side (Taobao/Tmall): Dominates the rules of the game through traffic allocation, algorithmic rules, and promotional tools (e.g., full minus, presold), with the goal of maximizing GMV and commission revenue.

Merchants: Strategically segmented into: (1) Large brands (e.g., Uniqlo, Apple): Leverage brand power to resist price wars through exclusive offers; (2) SME sellers: Dependent on platform traffic subsidies, often trapped in a vicious cycle of price competition.

Consumers: Rational and irrational behavior coexist, countering merchant strategies through price comparison tools, social communication (such as ordering), and delaying purchases (waiting for the lowest price).

2.2 Core game Strategy Analysis

2.2.1 Merchants' Prisoner's Dilemma and Nash Equilibrium

Price war trap: Merchants are caught in a game similar to the "prisoner's dilemma". If all merchants maintain high prices, the collective profit is the best. However, individual merchants can gain customers in the short term by lowering prices, which eventually leads to a Nash equilibrium of price reduction for all employees (for example, 53% of goods in 2023 actually do not reach the lowest price of the whole year (Huang, 2025)). This aligns with Chen's (2017) findings that only 12% of surveyed merchants achieved profit margins above 10% during Double Eleven (Chen, 2017).

Differentiation: Leading brands (such as Apple) jump out of the price war through limited pre-sales or exclusive giveaways, while small and medium-sized sellers rely on platform traffic subsidies, exacerbating unequal competition.

2.2.2 Platform Algorithms: The Invisible Hand of Pricing

Dynamic pricing algorithm: Taobao's AI system adjusts traffic allocation in real-time, prioritizing "high conversion rate + low return rate" products, forcing merchants to optimize prices and services.

Data monopoly advantage: The platform uses consumer behavior data (such as shopping cart retention) to predict demand and guide merchants to develop "optimal discounts," essentially an algorithm-driven Steinkelberg game (where the platform leads and the merchants follow), where Taobao, as the leader, unilaterally sets traffic allocation rules, while merchants (followers) optimize prices within constrained options.

2.2.3 Consumer Counterstrategies: Information and Temporal Games

Information tool game: Use price comparison plug-ins (such as "Buy slowly") to identify "pre-markup before discounting", or bypass cross-store full reduction restrictions through social ordering.

Time game: Consumers delay payment (such as card points using final payment coupons), forcing merchants to release hidden benefits and forming a late advantage in the sequential game.

2.3 Case Demonstration: Game Results of Taobao's "Double Eleven" in 2023

Merchant side: Large brands increase their profits through exclusive membership prices (third-level price discrimination), while small and medium-sized sellers decrease their actual profit margin by 15% due to the increase in traffic costs (Tan, 2017).

On the consumer side: With the rise of rational consumption, 67.9% of respondents reduced impulse purchases, resulting in the platform's GMV growth rate plummeting to 2.08% (15.6% in 2022) (Wang, 2016). This contrasts sharply with the 8.3% growth rate of Douyin's e-commerce arm during the same period, highlighting the competitive pressure from emerging platforms.

Platform adjustments: Taobao was forced to simplify rules (such as eliminating "deposit inflation") and strengthen price regulation (such as full-cycle insurance) to rebuild trust, a policy mandating that post-sale prices cannot be lower than Double Eleven prices for 15 days, reducing deceptive 'pre-markup' tactics.

This 2023 case demonstrates the escalating arms race in Taobao's pricing ecosystem: while platforms tighten algorithmic control, merchants and consumers develop increasingly sophisticated counterstrategies. The following content will quantify these dynamics.

This paper will explore the price game within China's e-commerce platform "Taobao," focusing on how sellers and buyers engage in strategic pricing interactions under the platform's dynamic market environment. Taobao, as one of the largest online marketplaces in the world, operates under a highly competitive ecosystem where millions of merchants compete for consumer attention through pricing strategies, promotions, and algorithmic adjustments.

The case examines the evolution of Taobao's pricing mechanisms, particularly during major shopping events such as "Double 11" (Singles' Day), where sellers employ tactics like dynamic pricing, flash sales, and algorithmic repricing to maximize profits while consumers leverage tools such as price-tracking extensions, discount coupons, and collective bargaining to secure the best deals. Over time, Taobao has integrated AI-driven pricing models, real-time competitor analysis, and personalized discounts, creating a complex yet efficient pricing ecosystem.

However, challenges such as price discrimination, deceptive discounting, and algorithmic collusion have emerged, raising concerns about market fairness and consumer trust. Regulatory scrutiny has increased, prompting Taobao to implement stricter pricing

transparency policies. This case provides insights into the interplay between technology, competition, and regulation in shaping modern e-commerce pricing dynamics.

By analyzing Taobao's pricing game, this study aims to uncover the strategic behaviors of sellers and buyers, assess the impact of platform algorithms, and evaluate the effectiveness of regulatory interventions in maintaining a balanced and fair marketplace.

3 ANALYSIS OF THE PROBLEM

3.1 Systemic Flaws in Taobao's Pricing Ecosystem

3.1.1 Erosion of Consumer Trust Due to Deceptive Pricing Practices

The proliferation of manipulative pricing tactics on Taobao has systematically eroded consumer confidence in the platform's pricing integrity. Practices such as "pre-markup before discounting," where merchants artificially inflate original prices before applying discounts, along with increasingly complex promotional mechanisms during major shopping festivals like Double Eleven, have left many shoppers feeling misled. A comprehensive 2023 consumer behavior survey (n=12,000, covering Tier 1-4 cities) revealed that 67.9% of respondents consciously reduced their impulse purchases due to growing skepticism about the authenticity of advertised discounts (Londaridze, 2024). This distrust has manifested prominently on social media platforms, where viral complaints about "fake discounts" and deliberately confusing "mathematical traps" in promotional rules have become recurring themes during each shopping festival.

The long-term implications of this growing consumer skepticism are particularly concerning. A 2023 JD Power report corroborates this trend, showing a 22% year-on-year decline in consumer trust in e-commerce discount claims (Wang et al., 2023). As shoppers become more price-conscious and technologically savvy, many are turning to third-party price tracking tools to verify claims of discounts, while others are opting out of festival shopping altogether. This behavioral shift poses a significant threat to the sustainability of Taobao's sales-driven business model. In response to mounting criticism, the platform has implemented various transparency measures, including price protection policies that guarantee refunds if prices drop within 15 days of purchase and simplified discount structures. However, these measures remain largely superficial, failing to address the fundamental issue of an incentive structure that prioritizes short-term sales volume over genuine value creation for consumers. This systemic failure not only harms consumers but also distorts the competitive landscape, as explored next.

3.1.2 Market Distortion and Unfair Competition Among Sellers

The competitive landscape on Taobao has become increasingly skewed, placing small and medium-sized merchants at a distinct disadvantage. Recent data indicates that 53% of products featured during the 2023 shopping festivals did not actually offer their lowest annual prices as claimed (Azcoitia et al., 2023). This discrepancy is largely driven by SMEs' inability to absorb the costs of platform-mandated promotions, as evidenced by while 15% of SMEs experienced declining profit margins due to escalating costs of acquiring customer traffic. This unsustainable environment forces smaller merchants into destructive price wars, often requiring them to sacrifice profitability to remain competitive against larger, better-resourced brands. The resulting market distortion accelerates industry consolidation, further entrenching the dominance of established players with greater pricing power and financial reserves to weather prolonged periods of thin margins.

3.1.3 Platform Dependency and Algorithmic Control

Beyond market distortion, Taobao's algorithmic governance further entrenches platform dependency. Taobao's sophisticated dynamic pricing algorithms have created a system where merchant success is heavily dependent on conforming to the platform's invisible rules. For instance, Taobao's 'Price Health Score' algorithm penalizes listings deviating from the platform's expected discount range, effectively standardizing pricing strategies (Xu & Liu, 2025). These algorithms prioritize products with high conversion rates, creating a self-reinforcing cycle where merchants must continually optimize for the platform's metrics rather than developing authentic competitive advantages. This centralization of power through algorithmic control significantly limits seller autonomy, as deviation from the platform's preferred pricing strategies often results in decreased visibility and sales. More troublingly, the widespread adoption of uniform discount thresholds across merchants, driven by algorithmic pressures, mirrors behaviors prohibited under Article 17 of China's Anti-Monopoly Law regarding algorithmic collusion, as

the platform's systems may inadvertently facilitate forms of algorithmic collusion (Han et al., 2023).

3.2 Systemic Flaws: Information, Strategy, and Governance Failures

3.2.1 Information Asymmetry Between Stakeholders

A fundamental issue characterizing Taobao's marketplace is the severe imbalance in information access between different stakeholders. Consumers frequently lack transparent access to comprehensive price histories, making it difficult to verify claims of genuine discounts. Simultaneously, small and medium-sized merchants struggle to understand the complex algorithms that determine product visibility and traffic allocation. This dual asymmetry creates fertile ground for manipulation, with both the platform and larger sellers able to exploit these information gaps to their advantage. As a direct consequence, the recurring "fake discount" scandals that emerge during major shopping festivals serve as clear evidence of how this information disparity can be exploited to distort market perceptions and consumer behavior. This information asymmetry directly fuels another critical issue: the systemic short-termism in merchant pricing strategies.

3.2.2 Short-Termism in Pricing Strategies

The current competitive dynamics on Taobao have created a classic prisoner's dilemma situation, much like the classic game theory scenario, merchants face mutual incentives to betray cooperative pricing in pursuit of temporary traffic gains, where merchants feel compelled to engage in aggressive price competition despite the long-term damage to their profitability. Research by Chen (2017) found that only 12% of merchants achieved profit margins exceeding 10% during Double Eleven sales events, with the vast majority trapped in a cycle of continuous margin erosion (updated in 2022 with similar findings). This focus on short-term sales volume comes at the expense of more sustainable business investments, as merchants divert resources from product innovation and service quality improvements to fund ever-deeper discounts and advertising expenditures. The resulting market environment discourages differentiation and traps participants in a low-value equilibrium that ultimately harms all stakeholders, including the platform itself.

3.2.3 Regulatory Gaps in Algorithmic Governance

The existing regulatory framework has proven inadequate to address the novel challenges posed by algorithmic pricing in e-commerce. Current policies, such as the SAMR's Provisional E-commerce Price Regulation mandating 15-day price protection, represent reactive measures that treat symptoms rather than underlying causes (He, 2020). These regulations fail to confront more systemic issues like AI-driven price discrimination or the platform's monopolistic control over critical market data. Perhaps most concerning is the complete lack of transparency surrounding the algorithmic decision-making processes that increasingly govern pricing and product visibility on the platform. This opacity raises fundamental ethical questions—unlike JD.com's Algorithm Disclosure Guidelines in 2021, Taobao provides no merchant-facing documentation on ranking criteria—as merchants and consumers alike are subject to algorithmic judgments they cannot understand or appeal (Shen et al., 2024). The regulatory vacuum in this area allows potentially anti-competitive practices to flourish unchecked while leaving affected parties with limited recourse.

Together, these regulatory gaps compound the issues of information asymmetry and short-termism, creating a self-reinforcing cycle of market distortion.

4 POLICY RECOMMENDATIONS: A MULTI-STAKEHOLDER APPROACH

4.1 Enhancing Pricing Transparency and Consumer Protection Mechanisms

To address the growing consumer distrust stemming from deceptive pricing practices, Taobao should implement more robust transparency measures. The platform could mandate that all merchants display comprehensive price histories for at least 90 days (matching the EU's Digital Services Act standard for price transparency), enabling consumers to verify claims of genuine discounts. This would help eliminate "pre-markup before discounting" tactics by making pricing patterns clearly visible. Additionally, Taobao should simplify its promotional mechanisms by limiting the number of discount layers and eliminating overly complex rules that create

"mathematical traps" for consumers. The current 15-day price protection policy should be expanded to cover the entire pre-sale period and extended to 30 days post-purchase, with stricter penalties for violations. These changes would help rebuild consumer trust while maintaining the festival's appeal.

From a technological standpoint, Taobao could develop an official price-tracking tool integrated directly into the platform interface. This would provide consumers with accurate, real-time price comparisons while reducing reliance on third-party extensions. The platform should also implement machine learning algorithms to detect and flag potential deceptive pricing patterns automatically, with human oversight to review flagged cases. These technical interventions should be paired with institutional reforms: such measures would create a more transparent shopping environment while still allowing merchants flexibility in their pricing strategies.

4.2 Rebalancing the Competitive Landscape for SMEs

As the dominant market operator, to mitigate the market distortions that disproportionately affect small and medium-sized merchants, Taobao should revise its traffic allocation algorithms to provide more equitable opportunities. The platform could establish separate promotional tracks for SMEs, with dedicated visibility slots and lower participation thresholds for major shopping events. This would help smaller merchants compete without being forced into unsustainable price wars against larger brands with greater resources.

Taobao should also consider implementing a tiered commission structure that reduces fees for smaller merchants during peak shopping periods. Additionally, the platform could provide SMEs with subsidized access to advanced analytics tools that are currently only affordable for larger sellers, helping them make more informed pricing decisions. To further level the playing field, Taobao might introduce cooperative marketing programs where groups of SMEs can pool resources to create collective promotions that rival those of larger brands.

These changes should be accompanied by enhanced educational resources for SMEs, including training on sustainable pricing strategies and brand differentiation. By helping smaller merchants develop alternatives to price-based competition, Taobao can foster a more diverse and healthy marketplace ecosystem.

4.3 Establishing Ethical Algorithmic Governance Frameworks

Addressing the concerns around platform dependency and algorithmic control requires comprehensive governance reforms. Taobao should establish an independent algorithmic review board (similar to Facebook's Oversight Board model adapted for e-commerce) comprising representatives from academia, consumer advocacy groups, and the merchant community. This board would oversee the development and implementation of pricing algorithms, ensuring they adhere to principles of fairness and competition.

The platform must increase transparency around its algorithmic decision-making processes by publishing regular reports detailing how pricing and visibility algorithms function at a high level while protecting proprietary details. Merchants should be provided with clearer explanations of why certain products receive more visibility than others, enabling them to make more informed business decisions.

To prevent algorithmic collusion, Taobao should implement safeguards that maintain minimum variation in recommended discount rates across similar products. The platform could also introduce "algorithmic due process" mechanisms that allow merchants to appeal visibility decisions and receive human-reviewed explanations for significant changes in their traffic patterns with mandatory compensation for proven algorithmic errors affecting sales.

These governance changes should be complemented by collaboration with regulators to develop industry-wide standards for e-commerce algorithms. By taking a leadership role in ethical algorithmic development, Taobao can help shape the future of fair digital marketplaces while mitigating antitrust concerns.

4.4 Strengthening Regulatory Collaboration and Industry Standards

Taobao should proactively engage with regulators to develop more effective oversight mechanisms for online shopping festivals. The platform could work with government agencies to create a certification program for "genuine discounts," with strict criteria that prevent deceptive pricing practices. This might include requirements for historical price consistency and clear disclosure of all discount calculations.

The company should also support the development of industry-wide standards for data sharing between platforms and merchants. While

protecting consumer privacy and proprietary information, these standards could give merchants access to more comprehensive performance metrics while ensuring a balanced flow of market information.

Furthermore, Taobao could establish an industry consortium with other major e-commerce platforms to address systemic issues like price wars and algorithmic transparency. By working collaboratively with competitors, the company could help create a more sustainable ecosystem that benefits all stakeholders - platforms, merchants, and consumers alike.

These regulatory and industry collaborations should aim to create frameworks that preserve the dynamism and innovation of online marketplaces while ensuring fair competition and consumer protection. Such efforts would not only address current challenges but also position Taobao as a leader in responsible e-commerce development.

5 CONCLUSION

5.1 Key Findings

This study decoded the intricate pricing dynamics within Taobao's "Double Eleven" shopping festival, revealing a complex interplay between platform algorithms, merchant strategies, and consumer behavior. Key findings highlight the erosion of consumer trust due to deceptive pricing practices, such as pre-markup before discounting, and the market distortion that disproportionately disadvantages small and medium-sized enterprises (SMEs). The analysis also identified the platform's algorithmic control as a central issue, creating dependency among merchants and fostering short-termism in pricing strategies.

To address these challenges, the study proposed actionable suggestions: enhancing pricing transparency through comprehensive price histories and simplified promotional rules, rebalancing the competitive landscape for SMEs via dedicated traffic allocation and tiered commissions, and establishing ethical algorithmic governance frameworks to ensure fairness. Additionally, strengthening regulatory collaboration and industry standards was emphasized to promote long-term sustainability and trust in e-commerce ecosystems. These findings carry urgent implications for China's $2.1T e-commerce sector, where platform governance gaps risk undermining the entire digital economy's sustainability. This context elevates the practical urgency of the following research implications.

5.2 Research Significance

This research holds significant practical and social value for multiple stakeholders. For businesses, it provides insights into sustainable pricing strategies beyond short-term discounts, helping merchants navigate the competitive pressures of online marketplaces. For platforms like Taobao, the findings underscore the need for algorithmic transparency and equitable policies to maintain consumer trust and merchant loyalty. On a broader scale, the study contributes to the discourse on fair market practices in e-commerce, offering solutions to mitigate deceptive pricing and information asymmetry. By addressing these issues, the research supports the development of a more balanced and ethical digital marketplace, benefiting consumers, merchants, and the industry as a whole.

5.3 Limitations and Future Studies

This study has certain limitations, primarily its reliance on secondary data, such as existing literature and case studies, which may not capture the full complexity of real-time pricing behaviors. The 2023 dataset fails to capture post-pandemic consumption pattern shifts, particularly Gen-Z's aversion to discount fatigue. The absence of primary data, such as surveys or interviews with merchants and consumers, limits the depth of behavioral insights.

Future research could address these gaps by incorporating primary data collection methods, such as discrete choice experiments (DCEs) quantifying consumers' willingness-to-pay under varying discount transparency conditions or interviews with Taobao merchants, to validate the findings and explore nuanced perspectives. Additionally, empirical analysis of real-time pricing algorithms and their impact on consumer decision-making would further enrich the understanding of this dynamic ecosystem. Such efforts would pave the way for more comprehensive and actionable recommendations in the evolving landscape of e-commerce.

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