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The Global Electric Vehicle (EV) Industry Price War: Implications for Managerial Decision-Making

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Abstract

This paper provides an in-depth analysis of the price war dominated by Tesla and BYD in the global electric vehicle (EV) industry between 2023 and 2025, along with its managerial implications. The study reveals that as market competition transitions from the initial growth phase to a zero-sum stage, the stimulative effect of price leverage on Total Revenue (TR) has diminished, primarily driven by structural shifts in the Price Elasticity of Demand (PED). Applying game theory models, the analysis demonstrates that automakers have fallen into a classic "Prisoner's Dilemma" under conditions of incomplete information. This has resulted in a widespread structural collapse of industry profit margins; notably, Tesla's net profit for the third quarter of 2025 fell to $2.95 billion, representing a significant year-on-year decline of 40.5%. A comparative analysis indicates a stark divergence in financial resilience between the two leading firms: while Tesla's gross margin retracted to approximately 15.4% due to frequent price adjustments, BYD maintained a robust automotive gross margin of 20% in the first half of 2025, attributed to its profound Vertical Integration and Economies of Scale. Furthermore, the study highlights that frequent price volatility has not only eroded brand equity but also triggered a "wait-and-see effect" among consumers, causing the short-term demand curve to become increasingly inelastic. The paper concludes that the competitive logic of the EV industry is transitioning from "hardware-based pricing" to "value reconstruction." Strategic managers should transcend homogeneous price competition and establish a differentiated moat through non-price competition strategies, including Software-Defined Vehicles (SDV), cost optimization via vertical supply chain integration, and the implementation of brand residual value protection systems, thereby facilitating a strategic leap from scale-driven expansion to efficiency-driven growth.

Keywords

Electric Vehicles; Price War; Price Elasticity of Demand (PED); Game Theory; Vertical Integration; Managerial Decision-Making.

1. Introduction

Over the past decade, the global automotive industry has undergone a profound paradigm shift, transitioning from traditional internal combustion engine (ICE) vehicles to electric vehicles (EVs). According to industry data from 2025 and early 2026, EV market penetration has reached record highs, evolving into a core metric for evaluating national manufacturing competitiveness [1]. However, as the sector pivots from early policy-driven growth-characterized by government subsidies and carbon emission quotas-toward a purely market-

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driven dynamic, the EV market has transitioned from a high-growth "blue ocean" into a "red ocean" phase defined by intense competition for existing market share. Since the global price reductions initiated by industry leader Tesla in early 2023, the sector has been embroiled in a sustained and intensive "price war" [2].

This macro trend of simultaneous market expansion and downward price pressure is intuitively reflected in the data (see Figure 1). Statistics indicate that global EV sales surged from 10.5 million units in 2022 to approximately 20.7 million in 2025, with projections exceeding the 25 million mark by 2026 [3]. Concurrently, the average selling price (ASP) per vehicle has continuously declined from approximately $55,000 in 2022 and is expected to drop to roughly $40,000 by 2026 [4]. This divergent trend reveals that managers, operating within an environment of intense oligopoly competition, are leveraging economies of scale and sacrificing short-term gross margins to secure long-term market dominance. Such frequent price volatility has not only reshaped consumer purchasing expectations but also fundamentally destabilized the industry's profit structure [5]. From a managerial standpoint, the price war is not merely a tactical marketing tool but a critical business-economic decision concerning long-term survival.

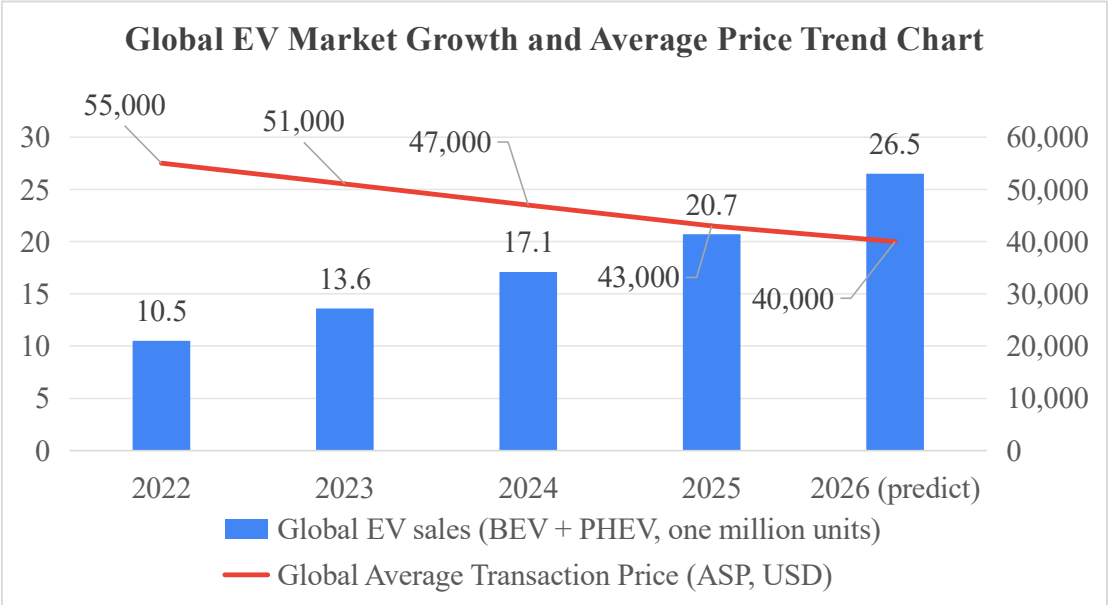

Figure 1. Global EV market growth and average selling price (ASP) trends.

This study aims to evaluate the impact of the global electric vehicle (EV) price war on corporate decision-making between 2023 and 2026 by analyzing stylized facts within the industry. By applying microeconomic principles-specifically market power, production cost structures, and competitive game theory-the research examines the profound implications of this phenomenon for industry stakeholders through empirical data analysis. Furthermore, the paper provides strategic recommendations from a managerial perspective for navigating environments characterized by extreme price competition.

2. Stylize Facts/Data Analysis

2.1. Market Share and Sales Volume

The year 2025 is widely acknowledged as a "watershed" for the competitive landscape of the global battery electric vehicle (BEV) industry. This year marked the conclusion of the industry's long-standing unipolar leadership, witnessing a historic shift in the hierarchy of leading

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manufacturers [6]. Regarding delivery scale, BYD achieved robust expansion in 2025 through its diversified product matrix, recording annual BEV sales of 2.26 million units—a significant year-on-year increase of 27.9%. In stark contrast, Tesla, the long-term market leader, exhibited stagnant growth under the pressure of aggressive price wars, with annual deliveries retreating to 1.636 million units, representing a year-on-year contraction of approximately 8.6% [7]. This divergent performance has directly reshaped the global market landscape (see Figure 2): by the end of 2025, BYD's global BEV market share significantly ascended to 12.1%, while Tesla's share was compressed to 8.8% [8].

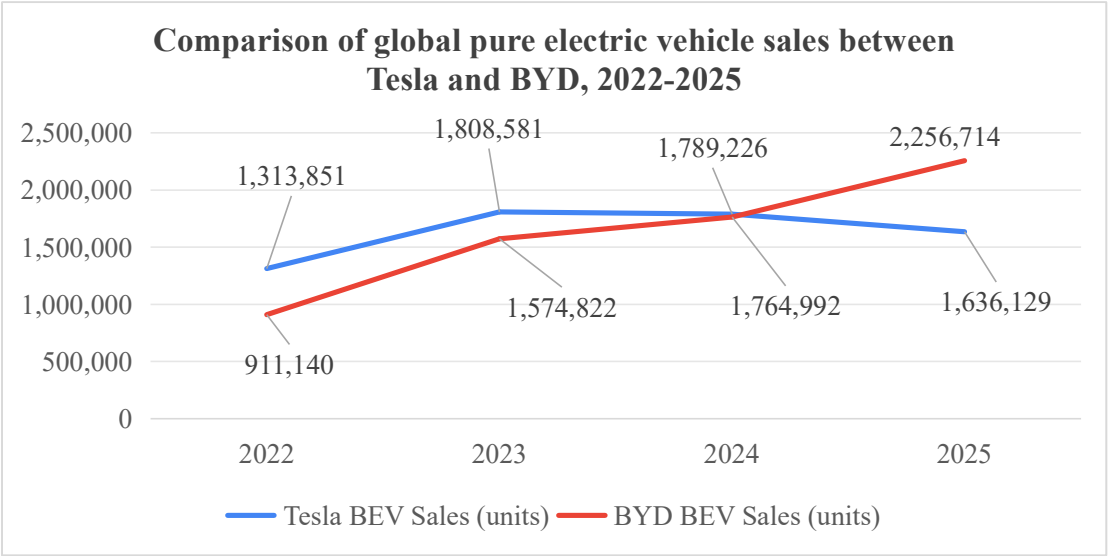

Figure 2. Comparison of global pure electric vehicle sales between Tesla and BYD, 2022-2025

As a "barometer" of the global electrification process, the competitive dynamics within the Chinese market profoundly reflect the efficacy of these managerial decisions. In 2025, Tesla's sales in China reached approximately 600,000 units; while this still accounted for nearly 30% of its total global output, the brand's market "moat" faced severe challenges amidst the comprehensive encirclement by Chinese domestic brands [9]. As Chinese automakers demonstrate exceptional resilience in technological iteration and cost control, the established market share previously held by multinational brands is being rapidly eroded. This displacement in sales volume is more than a mere numerical fluctuation; it is a direct manifestation of the differentiated performance between management teams regarding production capacity allocation and localized competitive strategies [10].

2.2. Profitability and Margin Divergence

The continuous escalation of the price war has exerted an asymmetric impact on the financial health of industry leaders. While sales volume remains a critical metric for market standing, the trajectory of the Gross Margin provides a more profound revelation of the heterogeneity in managerial cost control and strategic positioning.

During this competitive cycle, Tesla's profitability has exhibited a clear contractionary trend. Directly eroded by frequent price-reduction strategies, Tesla's automotive gross margin has retreated from its once industry-leading level of over 25% to approximately 15.4% as of the third quarter of 2025. Net profit for the first three quarters of 2025 was recorded at $2.954 billion, representing a sharp year-on-year decline of 40.5%. This financial performance reflects a managerial trade-off under a "volume-first" decision-making framework, where short-term unit profits are sacrificed to offset the pressures of market share erosion.

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In contrast, BYD has demonstrated superior financial resilience amidst this intensive price game. As of the third quarter of 2025, BYD's automotive gross margin has remained robust, stabilizing at a high of 20.6% despite the downward pricing pressure. The core of this divergent phenomenon lies in BYD's management model of deep Vertical Integration. By internally developing batteries, semiconductors, and other core components, BYD has been able to effectively absorb the shocks of falling terminal prices. From a managerial perspective, BYD has leveraged Economies of Scale not only to dilute fixed costs but also to maintain a wider "profit moat" in extreme pricing environments through absolute control over its supply chain. To further illustrate the fluctuations in profitability during the price war, Table 1 summarizes the comparative gross margin data and key strategic shifts for both companies from 2022 to 2025.

Table 1. Comparison of Automotive Gross Margin Trends (2022-2025)

Time Period	Tesla Gross Margin	BYD Gross Margin	Industry Context & Management Decisions
2022 Q1 (Peak)	29.11%	12.40%	High Tesla premium; BYD scaling production.
2022 FY (Annual)	25.60%	16.80%	Overcapacity issues; end of high-margin era.
2023 Q1 (Inception)	19.30%	17.90%	Global price cuts vs. BYD economies of scale.
2023 FY (Annual)	18.20%	18.20%	Convergence: Profit parity in price war.
2024 Q4 (Saturation)	16.30%	16.00%	Market saturation; Tesla margins bottoming.
2025 Q1 (Reversal)	16.31%	20.70%	Reversal: BYD leads via vertical integration.
2025 Q3 (Stabilization)	18.00%	17.61%	Steady state; Tesla pivots to FSD & software.

2.3. Magnitude and Intensity of Price Volatility

The intensity of the price war is manifested not only in the absolute magnitude of individual price reductions but, more significantly, in the high frequency of adjustments and their profound impact on the industrial ecosystem. Between 2024 and 2025, the pricing logic of the global electric vehicle (EV) market underwent a structural shift from "cost-oriented" to "game-oriented" strategies. Starting in 2024, price adjustments evolved from traditional seasonal promotions into a normalized competitive instrument. Exemplified by BYD's "Electricity Cheaper than Oil" campaign, the launch of "Glory Edition" models slashed starting prices for several mainstream vehicles by 10% to 20% within a few months. This high-frequency adjustment model forced managers of mid-stream and downstream brands to react within extremely narrow decision windows to avert the risk of instantaneous order loss. Concurrently, Tesla's adoption of similar dynamic pricing strategies led to substantial cumulative price drops per vehicle, fundamentally disrupting the industry's established price stability. These drastic fluctuations were largely fueled by a precipitous decline in production costs-most notably, the price of lithium carbonate, a core raw material, which crashed from a 2023 peak of approximately 600,000 RMB/ton to roughly 60,000 RMB/ton by 2025. While this provided managers with significant "pricing ammunition," it simultaneously introduced severe challenges regarding inventory management and asset impairment.

However, frequent price adjustments have yielded significant negative externalities, specifically the collective collapse of EV residual values. By 2025, the one-year residual value of mainstream models generally fell below 60%; for instance, the secondary market retail price of the Tesla Model S plummeted by 17.2%. From a managerial decision-making perspective, such

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volatile value fluctuations not only erode brand equity but also trigger a "wait-and-see effect" among consumers, prompting potential customers to postpone purchases in anticipation of further price declines. Consequently, frequent price reductions have become a double-edged sword for management, necessitating a difficult strategic equilibrium between expanding market share through aggressive pricing and preserving long-term brand value and consumer loyalty.

3. Economic Implications for Firms and the Industry

3.1. Pricing Strategy and Price Elasticity of Demand

Within the analytical framework of business economics, managerial pricing decisions are not merely an indiscriminate pursuit of market share; rather, their underlying logic is fundamentally predicated upon the precise assessment of the Price Elasticity of Demand (PED). The correlation between pricing strategies and fluctuations in Total Revenue (TR) can be delineated through the following simplified formula:

$$\Delta TR \approx P \cdot \Delta Q + Q \cdot \Delta P \tag{1}$$

This formula elucidates that whether a price reduction (<0) can successfully generate revenue growth is entirely contingent upon whether the positive contribution from volume gains () offsets the negative deficit caused by price erosion. From a managerial standpoint, when a product operates within a price-elastic region (|Ep|>1), reducing prices to drive a proportionately larger increase in sales volume constitutes a rational dominant strategy for total revenue expansion. During the nascent stages of the price war, Tesla and BYD capitalized on the high elasticity characteristic of electric vehicles (EVs) relative to traditional internal combustion engine (ICE) vehicles, rapidly achieving economies of scale through aggressive pricing.

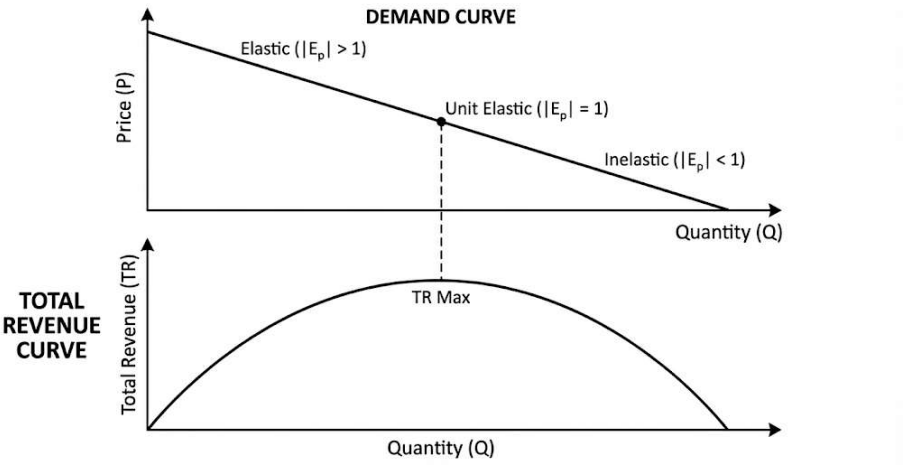

Figure 3. Theoretical Relationship between Price Elasticity

As illustrated in Figure 3, the trajectory of the total revenue function is strictly constrained by the price elasticity of demand . When the market operates within the price-elastic region, marginal price reductions drive a more significant expansion in sales volume, causing the TR curve to trend upward. However, once the market enters the price-inelastic region-as seen in the current "deep-water" phase of the price war, exacerbated by the wait-and-see effect-further

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price cuts lead to a contraction in total revenue. This model intuitively elucidates why, in early 2025, despite the adoption of more aggressive pricing strategies by Tesla and BYD, their profit margins and total revenues failed to achieve synchronized growth, instead falling into the quagmire of diminishing marginal returns.In actual dynamic games, this revenue growth logic predicated on elasticity theory faces severe challenges from the "wait-and-see effect." As the price war transitions from short-term promotions to a protracted stalemate, consumer expectations undergo a structural shift. Frequent price signals have failed to stimulate purchases as anticipated; instead, they have solidified a psychological anchor that "prices will be even lower in the future." The direct consequence of this expectation is that the demand curve exhibits markedly inelastic characteristics within the current price range. At this juncture, even if managers continue to implement substantial price reductions, the marginal increment in sales volume remains extremely limited due to deferred consumption. Consequently, this not only fails to bolster total revenue but also leads to financial deterioration as per-vehicle profit margins are excessively compressed. This dilemma reveals the inevitability of the law of diminishing marginal utility under extreme price competition. From this perspective, a solitary price lever can no longer sustain effective growth in a mature market. When the marginal utility of the price lever approaches zero, the strategic axis must pivot from "price-driven" to "value reconstruction." Managers should employ non-price competition mechanisms-such as establishing technological barriers (e.g., Software-Defined Vehicles, SDV) and optimizing the brand service ecosystem-to alter the slope of the demand curve or shift the entire demand curve upward and to the right through product differentiation. Such strategies allow firms to bypass low-level price competition while regaining pricing leadership in the market.

3.2. Game Theoretical Analysis of the EV Price War under Oligopolistic Competition

The current global electric vehicle (EV) market exhibits quintessential characteristics of an oligopoly, in which the pricing behaviors of leading manufacturers-notably Tesla and BYD-manifest a significant degree of mutual interdependence. Within this market structure, managerial pricing strategies are not isolated financial decisions; rather, they represent a sophisticated game predicated on the anticipation of rivals' responses.This competitive stalemate can be effectively deconstructed using the "Prisoner's Dilemma" model from game theory. Even if an industry consensus suggests that maintaining high prices (analogous to tacit collusion) would maximize aggregate profits, the absence of mutual trust and enforceable constraints ensures that the inclination of each manager to defect from the consensus-in pursuit of short-term market share-dominates the decision-making process.

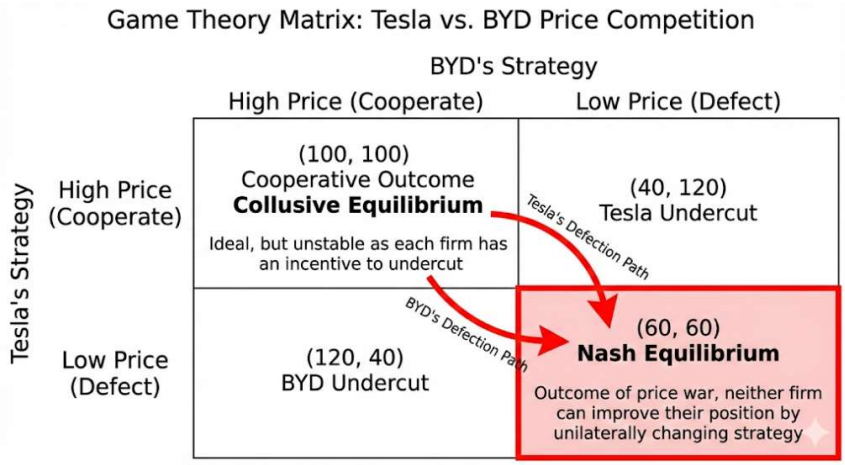

Figure 4. Payoff Matrix of Price Competition Game between Tesla and BYD (Prisoner's Dilemma and Nash Equilibrium)

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As illustrated in Figure 4, regardless of the competitor's chosen strategy, price reduction emerges as the dominant strategy for each individual firm. If one firm maintains its status quo while the other reduces prices, the latter will capture an excess payoff of 150 through rapid market share expansion, whereas the former will only retain a residual profit of 40 due to severe market erosion.

Driven by these psychological expectations, the outcome of the game inevitably converges toward the Nash Equilibrium of (60, 60). This state provides a profound explanation for the inevitability of the vicious cycle characterizing the price war between 2023 and 2026. It suggests that managers do not necessarily lack a holistic industry perspective; rather, under intense competitive pressure, they are compelled to adopt "defensive price reductions"-sacrificing profit margins to secure relative market share stability-to mitigate the catastrophic losses potentially caused by unilateral adherence to high pricing.Consequently, to escape this low-level game trap, managers must transcend purely price-based competition. By establishing asymmetric competitive advantages through technological barriers, the cost efficiencies of vertical integration, or brand differentiation, firms can decouple their products from homogenized price rivalry and seek a new, higher-dimensional equilibrium.

3.3. Production Costs, Economies of Scale and Vertical Integration

The ultimate price war is a battle of cost floors, not marketing. In a deflationary market, survival hinges on whether the reduction in Average Total Cost (ATC) outpaces falling selling prices. BYD's financial resilience stems from the synergy of vertical integration and economies of scale. Figure 5 depicts the mathematical relationship between output and unit cost via the Long-Run Average Cost (LRAC) curve.

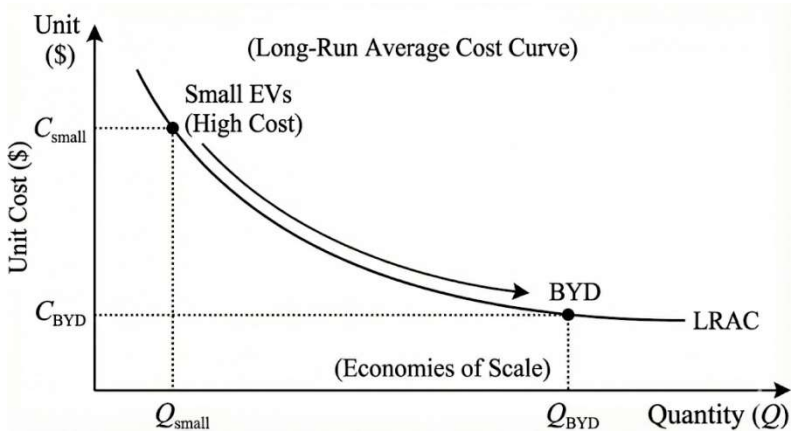

Figure 5. Economies of Scale and Long-Run Average Cost Curve

Unlike outsourced OEMs, BYD employs a closed-loop supply chain, controlling everything from batteries to semiconductors. Under Transaction Cost Theory, this integration minimizes contractual risks and internalizes profit margins. Amidst the 2025 lithium price collapse, BYD leveraged its battery scale to maintain an industry-low Marginal Cost (MC).

Massive sales volumes further dilute fixed costs, driving down the Long-Run Average Cost (LRAC). Surpassing the Minimum Efficient Scale (MES) grants managers superior pricing flexibility. In contrast, smaller firms failing to cover Average Variable Costs (AVC) are forced into shut-down decisions, fueling the 2024–2025 industry consolidation.

Strategically, Tesla prioritizes process innovation (e.g., giga-casting), whereas BYD relies on vertical depth to secure its cost moat. Ultimately, these superior cost structures provide the "strategic resilience" necessary to sustain profitability and R&D funding amidst a broader "lose-lose" price war.

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3.4. Structural Shifts in Consumer Behavior and Brand Equity

Prolonged price wars have restructured consumer internal reference prices and value anchors. EVs are transitioning from durable goods to rapidly depreciating consumer electronics.

Psychologically, frequent cuts trigger post-purchase dissonance. Short-term asset devaluation-exemplified by the 17.2% drop in Tesla Model S secondary prices-erodes brand loyalty. Driven by loss aversion, owners likely defect during future replacements. Concurrently, potential buyers shift to "expectation-driven" behavior, reinforcing the wait-and-see effect. Consumers delay purchases to capture maximum consumer surplus at the price floor, eroding brand equity and risking the commoditization trap. This complicates future margin expansion via software services (e.g., FSD) or premium models.

Strategically, managers must prioritize restoring value confidence over mere cost competition. Implementing residual value protection, leveraging technology for value-add, and pivoting toward life-cycle services are essential to rebuild value-based competitive advantages before brand equity is fully diluted.

4. Comments and Suggestions

4.1. Industry Assessment: The Painful Shift from Scale Expansion to Efficiency-Driven Growth

Amid global structural adjustments, the Tesla-BYD price war represents a deep industry shakeout rather than mere promotion, redefining entry barriers and competitive rules. Building on previous analyses of demand elasticity, game logic, and cost structures, this section evaluates the current industry landscape and offers targeted strategic recommendations for management.

The current price war marks the end of high-premium dividends, ushering the industry into a formal oligopolistic rivalry. Economically, while price volatility erodes short-term margins, it serves as a catalyst for industry consolidation, forcing concentration toward the Minimum Efficient Scale (MES) by eliminating obsolete capacity.

However, excessive reliance on price leverage triggers brand commoditization and undermines consumer confidence in EVs as durable assets. Sustained price-centric competition risks industry-wide profit collapse, potentially stifling long-term R&D in frontier technologies like solid-state batteries and autonomous driving. Consequently, the market has reached a precarious equilibrium, requiring firms to balance the market share needed for survival against the profit moats required for future innovation.

4.2. Strategic Recommendations: Building Differentiated Moats via Non-Price Competition

To escape the Prisoner's Dilemma, managers must transcend passive, one-dimensional responses and restructure competitive strategies across three dimensions:

(1) Pivoting from Hardware Sales to Ecosystem Value: Management should alter the nature of the demand curve by prioritizing Software-Defined Vehicles (SDV) and high-margin service subscriptions (e.g., Tesla's FSD, BYD's DiSus). This non-price competition hedges hardware margin erosion and increases switching costs through technological barriers.

(2) Optimizing Vertical Integration and Supply Chain Agility: Leveraging BYD's defensive model, firms should adopt a "core-in, generic-out" strategy-self-developing core components while outsourcing generic parts. This balances economies of scale (to dilute fixed costs) with the agility needed to mitigate raw material volatility and technological obsolescence.

(3) Implementing Residual Value Protection to Restore Confidence: To combat the wait-and-see effect, managers should implement Certified Pre-Owned (CPO) programs and buy-back

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schemes. Stabilizing internal reference prices mitigates post-purchase dissonance and revitalizes immediate demand by securing the product's perceived asset value.

References

[1] International Energy Agency. (2025) Global EV outlook 2025: Trends in electric car markets and projections to 2030. J. International Energy Agency Report. https://www.iea.org/reports/global-ev-outlook-2025

[2] Counterpoint Research. (2025) Global passenger EV forecast 2025: Competitive dynamics of the Tesla-BYD rivalry. J. Counterpoint Research. https://www.counterpointresearch.com/research/

[3] BloombergNEF. (2025) Electric vehicle outlook 2025: Long-term market projections and price parity analysis. J. BloombergNEF. https://about.bnef.com/electric-vehicle-outlook/

[4] You, H. (2025) Research on the value of listed companies in the global automotive industry: Tesla, BYD, and Toyota. J. SHS Web of Conferences, 218: 01019.

[5] Chen, J., Zhang, Z., Zhao, C., Zhang, S., Guo, W., Lu, C., Sun, X. (2023) Research on the purchase intention of electric vehicles based on customer evaluation and personal information. J. World Electric Vehicle Journal, 15(1): 9.

[6] J.P. Morgan Research. (2026) The great pivot: BYD's ascent and Tesla's plateau in the 2025 global BEV landscape. J. J.P. Morgan Global Equity Research.

[7] Xinhua. (2026) Update: BYD overtakes Tesla in 2025 EV sales. J. Xinhua News. https://english.news.cn/20260103/789a89edf76742a68efc1eae2b0939ed/c.html

[8] Carbon Credits. (2026) BYD overtakes Tesla as world's biggest EV seller in 2025. J. Carbon Credits. https://carboncredits.com/byd-overtakes-tesla-as-worlds-biggest-ev-seller-in-2025/

[9] Lee, S., Tan, Y. (2026) China's domestic dominance: Competitive resilience of local EV OEMs against multinational brands. J. Asia-Pacific Journal of Business Administration, 18(1): 45-62.

[10] World Electric Vehicle Journal. (2025) Strategic decoupling in the EV sector: Lessons from the Tesla-BYD price war and localized competition strategies. J. World Electric Vehicle Journal, 16(12): 412.