

Competitive Dynamics in the Badminton Racket Oligopoly: A Game-Theoretic Analysis of Differentiation Between YONEX and Li-Ning

Senbo Wang

*College of Science, Mathematics and Technology, Wenzhou-Kean University, Wenzhou, China
pt1040@qq.com*

Abstract. As badminton gains growing popularity across China, its premium racket segment has become a duopoly led by YONEX and Li-Ning. The two brands allocate core resources either to high-end professional products or mid-range mass-market lines, generating distinct competitive results. This paper establishes a 2×2 complete-information static game model and adopts the underline method to solve pure-strategy Nash equilibria, evaluating market efficiency via Pareto optimality. Results show that two win-win differentiated equilibria exist, yet the market falls into homogeneous high-end competition in reality. Constrained by Li-Ning's long-term brand upgrading goals, YONEX's defensive premium positioning, and a lack of coordination channels, individual rationality fails to deliver optimal market outcomes. This study clarifies the gap between static game prediction and real-world dynamic competition, offering theoretical references for sports goods segment competition research.

Keywords: Duopoly game, Nash equilibrium, Differentiated competition, Sports consumer goods, Guochao consumption trend

1. Introduction

The domestic badminton equipment market concentration has risen sharply amid the Guochao consumption boom. Existing literature covers three core research streams. First, industrial scholars analyzed the development logic of China's domestic sporting goods brands, pointing out that local enterprises rely on national cultural identity to realize brand overtaking in mass markets [1]. Second, sports equipment technical research confirmed YONEX's long-term leading edge in carbon fiber racket R&D, forming high technical barriers in professional competition circuits [2]. Third, duopoly game studies verified that product differentiation effectively alleviates cutthroat price competition, though shared expectation coordination is hard to achieve spontaneously [3]. Few studies combine game theory with China's badminton racket track to explain the contradiction between theoretical differentiated equilibrium and actual high-end homogenization, creating an identifiable research gap.

This paper firstly sorts out the brand development backgrounds of YONEX and Li-Ning, then compares their differentiated marketing and product positioning strategies, and finally summarizes operational enlightenment for sporting goods brands under dual competition between foreign and

domestic labels. Three research methods are adopted: literature analysis to sort out differentiated competition and game theories, comparative analysis to contrast two brands' strategic logic, and case analysis taking YONEX and Li-Ning as typical duopoly samples.

The research bears dual practical and theoretical value. Theoretically, it expands the application boundary of duopoly static game models in segmented sports consumer goods markets and supplements empirical evidence for differentiated competition theory. Practically, it systematically clarifies the core competitive logic of leading badminton racket brands, providing replicable positioning and marketing references for medium and small sporting goods manufacturers facing dual pressure from international giants and domestic Guochao brands.

2. Brand background and development history

2.1. YONEX: technology-driven global professional badminton giant

Founded in Niigata, Japan in 1946, YONEX stepped into badminton racket production in 1957 and dominated global professional badminton equipment for nearly 70 years. It officially entered China in the 1990s and reached its market peak during Lin Dan's competitive era from 2001 to 2016. After Lin Dan's retirement in 2020, the brand lost its core Chinese symbolic spokesperson and faced fierce impact from the rising Guochao trend and Li-Ning's market expansion [4].

YONEX's core competitive moat lies in continuous material and technological iteration. It holds a dominant share in international BWF tournaments, with over half of top professional players choosing its rackets. Its business layout centers on badminton products, accounting for 55%-60% of total revenue, supplemented by tennis and golf equipment lines. Targeting high-end professional enthusiasts, it maintains premium pricing and relies on top global athletes including Shi Yuqi, Anders Antonsen and Akane Yamaguchi for brand endorsement.

2.2. Li-Ning: Guochao local sporting goods leader focused on national team resources

Established in Beijing in 1990 by Olympic gymnastics champion Li Ning, the brand became the biggest beneficiary of China's Guochao consumption trend starting in 2018. It serves as the exclusive official apparel sponsor of China's national badminton team, gaining sustained domestic consumer exposure through national team match appearances [4].

Li-Ning extended its layout to badminton rackets as a core strategic segment to complete full-category sporting goods coverage. Different from YONEX's single high-end focus, it covers full price tiers from entry-level mass rackets to premium professional series. Driven by long-term brand upgrading objectives, it continuously launches flagship professional racket lines to compete directly with YONEX in the high-end market, capturing dual groups of amateur mass consumers and domestic professional players.

3. YONEX's differentiated competition strategy

3.1. Product differentiation: global high-end professional flagship limited lines

YONEX bases its core product differentiation on professional high-end positioning. Its core product matrix consists of ASTROX offensive series and NanoFlare speed series, targeting top competitive players and high-investment amateur enthusiasts. To adapt to Chinese market consumption preferences, it rolls out China-exclusive gold-red limited editions incorporating traditional Chinese

color aesthetics, forming differentiated products separated from Japanese and European market versions [4].

Entry-level rackets only serve as customer acquisition tools with low profit contribution, so YONEX rarely allocates core R&D and marketing resources to low-price segments. Its Power Cushion badminton shoes also form supplementary differentiated advantages, recognized by professional players as matching support equipment for high-end rackets.

3.2. Marketing differentiation: global tournament resources + professional athlete endorsement

YONEX's marketing differentiation centers on professional competitive authority certification. It maintains long-term sponsorship of all major BWF world tournaments, embedding brand value in the core scenario of top professional matches. In terms of athlete cooperation, it signs long-term exclusive contracts with world-class badminton players from multiple countries, taking Chinese top player Shi Yuqi as the core local spokesperson to narrow cultural distance with domestic consumers [4].

From the brand symbolism perspective, YONEX and Li-Ning present differentiated visual systems — geometric rationality versus Eastern symbolism — in their logo designs [5], suggesting that a natural basis for segment differentiation exists at the brand perception level. From the consumer perspective, university badminton enthusiasts assign relatively low importance to the product brand dimension but show a pattern of high importance combined with low satisfaction regarding the price dimension [6], indicating that there is unmet demand space in the mid-tier market. In digital marketing, the brand has accelerated layout on Douyin and Xiaohongshu in recent years, releasing match highlights and racket trial evaluation live streams to connect with young amateur groups, making up for its previous deficiency in Chinese social media operation. It avoids mass-oriented low-cost live broadcast sales, maintaining a premium brand image through professional trial activities offline.

4. Li-Ning's differentiated competition strategy

4.1. Product differentiation: full price tier layout balancing mass demand and high-end breakthrough

Distinct from YONEX's single high-end positioning, Li-Ning adopts full-segment coverage product differentiation logic. It launches low-priced entry rackets for student and casual amateur groups to seize basic market volume, while iterating N90 series flagship professional rackets to impact YONEX's high-end technical monopoly [2].

Taking domestic consumer aesthetic and usage habits as the core design standard, its racket appearance integrates traditional Chinese totems and cultural symbols, matching Guochao consumption preferences naturally. Supporting products including sportswear, shoes and shuttlecocks form a complete product ecosystem, realizing cross-selling between apparel and racket equipment to expand overall consumer spending per capita.

4.2. Marketing differentiation: national team exclusive sponsorship + local cultural Guochao marketing

Li-Ning's core marketing advantage comes from its exclusive long-term cooperation with China's national badminton team. All national team athletes wear Li-Ning sportswear in international events, forming an inherent consumer cognition linking Chinese badminton with the Li-Ning brand [4].

For civilian marketing, it deeply exploits Guochao cultural value, combining national sports honor and domestic brand identity in short videos and offline pop-up stores. Its digital marketing focuses on mass cost-effective publicity, cooperating with domestic amateur badminton influencers for popular racket evaluations, covering both professional circles and ordinary mass consumer groups comprehensively. It also relies on mature domestic offline channel networks covering sports stores and supermarket retail to realize nationwide market penetration.

5. Strategic game analysis of duopoly differentiated competition

5.1. Model basic assumptions and payoff matrix

This paper constructs a complete-information static game model with two players: YONEX and Li-Ning. Each brand holds two strategic choices: S_1 concentrating core resources on the premium professional segment; S_2 focusing resources on the mid-tier mass market. Payoffs only reflect short-term sales and channel profits, excluding long-term brand asset appreciation.

Table 1. Payoff matrix of the duopoly game between YONEX and Li-Ning

YONEX ↓ \ Li-Ning →	S_1 (Premium)	S_2 (Mid-tier)
S_1 (Premium)	(a, a)	(b, d)
S_2 (Mid-tier)	(d, b)	(c, c)

Table 1 presents the payoff matrix for the YONEX-Li-Ning duopoly game, where each firm chooses either the premium professional segment (S_1) or the mid-tier mass market (S_2), with the ranking $b > d > a > c$ derived from market logic.

The payoff ranking is derived from three layers of market logic.

Layer 1 (Homogeneous competition penalty): When both firms choose the same segment, product and consumer overlap trigger intensified marketing and R&D competition that compresses profit margins. Thus both a and c are relatively low.

Layer 2 (Segment premium differential): The premium segment commands stronger brand premiums, so homogeneous competition in the premium segment yields higher average returns than homogeneous competition in the mid-tier segment, giving $a > c$.

Layer 3 (Differentiation dividend): Differentiated positioning avoids direct competition and allows each firm greater pricing power within its chosen segment. The firm occupying the premium segment achieves the highest payoff; even the firm that moves to the mid-tier segment earns more than under homogeneous competition. This logic is supported by theory: higher levels of product differentiation weaken the erosion effect of price competition and expand firms' pricing power and profit margins [3]. The distinct differences between premium and mid-tier rackets in terms of technical specifications and consumer targeting enable the two firms to establish relatively independent market structures within their respective segments, avoiding the profit erosion associated with Bertrand-style price competition.

$$b > d > a > c$$

It is worth noting that this payoff ranking is context-dependent. The assumption $a > c$ relies on the current industry feature that the premium badminton racket segment commands stronger brand premiums. If the market structure undergoes major changes — for instance, if the mid-tier segment expands substantially while the premium segment shrinks — the ranking could reverse to $c > a$. Importantly, even if the relative ordering of a and c reverses, differentiated positioning remains a Nash equilibrium; what changes is the magnitude of the profit loss a firm incurs when deviating from differentiation toward homogeneous competition. This result suggests that the core conclusion of this paper does not depend on the specific ordering assumption $a > c$.

5.2. Nash equilibrium solution and Pareto optimality comparison

By adopting the standard underline method, two pure-strategy Nash equilibria are solved: (S_1, S_2) — YONEX high-end + Li-Ning mid-tier, and (S_2, S_1) — YONEX mid-tier + Li-Ning high-end. Both equilibria reach Pareto optimality, in which unilateral strategic adjustment would reduce an enterprise's own profit.

Based on Schelling's focal point theory [7], the market originally formed an expected stable differentiation pattern with YONEX dominating high-end markets and Li-Ning covering mass segments. However, Li-Ning's strategic demand for high-end brand upgrading broke shared market expectations, triggering coordination failure. Without credible communication and binding cooperation mechanisms, the two brands finally converge on the homogeneous competition strategy profile (S_1, S_1) .

5.3. Root causes of deviation between theoretical equilibrium and actual market

First, Li-Ning prioritizes long-term brand value over short-term profit. Sacrificing partial short-term earnings in high-end competition helps it break foreign brands' technical monopoly and build a premium domestic brand image, which cannot be achieved through pure mid-tier operation.

Second, YONEX faces irreversible brand loss if it abandons high-end positioning. Shifting core resources to mass segments will weaken professional players' and core enthusiasts' recognition of its technical authority, damaging its long-term global brand positioning.

Third, as direct competitors, the two brands lack effective coordination channels. Each side predicts that the rival will not voluntarily withdraw from the high-end track — Li-Ning expects YONEX to defend its historical dominance, while YONEX expects Li-Ning to continue its upgrading push. This mutual expectation, combined with the absence of any binding agreement mechanism, makes both firms simultaneously increase high-end investment, locking the market into the (S_1, S_1) outcome.

6. Enlightenments for sporting goods enterprises

First, foreign professional technical brands should take differentiated cultural localization as a breakthrough point. They can launch market-exclusive products integrating local cultural elements and deepen cooperation with local top athletes to weaken the negative impact of domestic Guochao trends, relying on accumulated technical advantages to lock high-value professional consumer groups.

Second, domestic Guochao brands should balance mass volume expansion and high-end technical breakthrough. While utilizing national cultural identity to seize civilian markets, these

brands should make sustained R&D investment to narrow the technical gap with international giants, thereby avoiding long-term low-end homogenized price competition.

Third, duopoly market participants can explore benign differentiated positioning to relieve inefficient competition. Separating target consumer segments reduces redundant R&D and marketing input, realizing mutually beneficial market division of labor; if long-term brand strategic objectives conflict, enterprises need to reasonably weigh short-term profit losses and long-term brand value gains before making resource allocation decisions.

Fourth, medium and small sporting goods brands should avoid direct head-on competition with duopoly leaders. They can segment niche tracks such as entry-level student rackets or women's lightweight series, building small-scale differentiated competitive advantages.

7. Conclusion

This paper takes YONEX and Li-Ning, the two leading brands in China's badminton racket duopoly market, as research objects, sorting out their respective development trajectories, product and marketing differentiated competition strategies, and further constructing a complete-information static game model to analyze their strategic interaction logic. Comparative analysis shows that YONEX relies on global technical accumulation, international tournament resources and professional athlete endorsement to form high-end professional differentiation advantages, while Li-Ning takes national team exclusive sponsorship and Guochao cultural marketing as core barriers, realizing full price tier market coverage. Game model derivation proves that two Pareto-optimal differentiated market division equilibria exist theoretically, yet the market falls into simultaneous high-end homogeneous competition in practice. Three core factors lead to this deviation: Li-Ning's long-term high-end brand upgrading demand, YONEX's necessity to defend its premium brand positioning, and the absence of credible coordination mechanisms between competitors. Based on the above analysis, this study summarizes targeted operational implications for foreign technical brands, domestic Guochao brands and small and medium sporting goods enterprises respectively, providing practical strategic references for segmented sporting goods market competition.

This research has several limitations. It adopts qualitative game reasoning without supporting quantitative revenue data to calibrate payoff parameters, and simplifies multiple market participants into a two-firm duopoly model, ignoring market interference from Victor, Kawasaki and other secondary brands. Future research can collect real corporate operating data to build quantitative dynamic game models, incorporate multi-brand competitive subjects and variable consumer preference factors, and further explore long-term competitive evolution rules of the badminton equipment market under persistent supply-demand disequilibrium.

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