

Research on Private Label Introduction Strategy of Dominant Retailers Considering Manufacturer Fairness Concerns: Postprint

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Abstract

This study investigates the store brand introduction strategy of a dominant retailer under manufacturer fairness concerns. In a supply chain characterized by the presence of a dominant retailer, we examine the impact of fairness concerns held by the disadvantaged manufacturer on supply chain decision-making. By combining the retailer's decision on whether to introduce a store brand with the manufacturer's potential fairness concern behavior, four distinct scenarios are constructed. The paper analyzes supply chain game models across these four scenarios, deriving equilibrium strategies, profit outcomes, and the corresponding conditions for store brand introduction. Further comparative analysis of the models explores how store brand introduction and manufacturer fairness concerns affect the decisions and profits of supply chain members. The findings reveal that manufacturer fairness concerns lead to higher wholesale prices and increased profits; retailer introduction of a store brand enhances profits for both the retailer and the overall supply chain; and when the store brand product substitution rate is relatively high, manufacturer profit levels also benefit.

Full Text

Preamble

Impact of Fairness Concern on Store Brand Strategy of Powerful Retailer

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Abstract: This paper examines the store brand introduction strategy of a powerful retailer under manufacturer fairness concerns, analyzing how fairness considerations of the weaker manufacturer affect supply chain decisions in a retailer-dominated supply chain. By combining scenarios of whether the retailer introduces a store brand and whether the manufacturer exhibits fairness concerns, four distinct situations are derived. Supply chain game models under each scenario are analyzed to obtain equilibrium strategies, profits, and the corresponding conditions for store brand introduction. Comparative analysis further explores how store brand introduction and manufacturer fairness concerns influence supply chain members' decisions and profits. The findings reveal that manufacturer fairness concerns lead to higher wholesale prices and increased profits for the manufacturer. Retailer store brand introduction enhances both retailer and supply chain profits, and can also benefit the manufacturer when the store brand product substitution rate is sufficiently high.

Keywords: store brand; fairness concern; powerful retailer; supply chain management

0 Introduction

In recent years, as manufacturing capabilities have continuously improved, retailers have gained increasingly important positions in supply chains. The emergence and rise of large retailers worldwide have made retailer dominance more pronounced, exemplified by Walmart, Carrefour, Amazon, and JD.com. This shift has given retailers significant advantages in supply chain profit distribution, while upstream manufacturers find themselves in a relatively disadvantaged and potentially unfair position, prompting fairness concerns among manufacturers. How do these fairness concerns affect supply chain members' decisions and profits in a retailer-led supply chain? How should the dominant retailer respond?

Simultaneously, retailer store brands have experienced rapid growth. Switzerland and the UK have the highest proportion of store brand retail sales globally, with Europe averaging 30%-40% store brand penetration. China's store brand development also shows an upward trend. The China Chain Store & Franchise Association reported in its 2016 Top 100 annual report that over 80% of top 100 enterprises had begun developing store brands. Store brand introduction enhances product differentiation while generating substantial profits for retailers. International retail giants such as Walmart, Carrefour, and Metro have actively participated, while e-commerce players like Amazon and JD.com have also aggressively expanded into store brands in recent years.

Extensive research has been conducted on store brands. Empirical studies by Hara et al. [1] examined product development collaboration between manufacturers and retailers, finding that both parties benefit when store brand product value increases despite intense competition from manufacturer brands. Fornari et al. [2] utilized sales panel data from 322 products in a supermarket from

2010-2013 to empirically investigate competition between manufacturer brands and store brands. Other scholars have studied factors influencing purchase intentions for store brand products. Rubio et al. [3] identified consumer loyalty to store brands as one of three determinants affecting retailer loyalty and trust. Liu et al. [4] found that individuals with stronger self-consciousness prefer manufacturer brand products when examining consumer preferences. Chung et al. [5] explored how store introductions of manufacturer versus store brands affect price leadership relationships, concluding that retailers' ability to reshape price leadership environments enhances their bargaining power. Empirical research generally agrees that store brand introduction benefits retailers through increased profits, enhanced customer loyalty, and improved bargaining power, though findings regarding manufacturer impacts vary. Perceived store brand quality, store image, and product display significantly influence consumer purchase decisions.

Other research has focused on store brand introduction strategies and quality decisions. Chung et al. [6] studied store brand quality decisions in vertically differentiated product categories, finding that store brand quality should not necessarily approach manufacturer brand quality, as it depends on consumer willingness-to-pay distributions. Choi et al. [7] examined competition between store brands and manufacturer brands, and among store brands themselves, in a supply chain with one manufacturer and two retailers, concluding that retailers should differentiate their store brands from each other while positioning them close to manufacturer brands, whereas manufacturers should differentiate their products from store brands. Fang et al. [8] found that retailer store brand introduction reduces total supply chain profits when manufacturer brand production costs exceed store brand costs, a situation that can be coordinated through minimum order quantity contracts. Jin et al. [9] compared channel strategies and store brand introduction strategies under retailer and manufacturer Stackelberg games across five single and dual-channel supply chain models. Nalca et al. [10] studied information sharing between manufacturers and retailers, finding that sharing consumer taste information benefits both parties despite intensified competition. Li et al. [11] demonstrated that under certain leadership structures, store brand imitation can enhance profits of the imitated manufacturer brand when market competition intensifies moderately. Li et al. [12] examined the competitive game between retailer store brand introduction and manufacturer direct channel introduction, deriving equilibrium strategies. These studies, based on rational economic agent assumptions, provide conclusions on store brand introduction and quality decisions but neglect behavioral preferences, particularly those of the weaker manufacturer, and their impact on store brand decisions.

Fairness concern, as an important irrational behavior, has attracted considerable scholarly attention. Cui et al. [19] introduced fairness concerns into channel coordination, designing a wholesale price contract to coordinate the supply chain under linear demand functions when only the retailer or both parties care about fairness. Caliskan-Demirag et al. [20] extended these findings to non-linear demand functions, demonstrating that supply chain coordination under

exponential demand functions requires slightly less stringent conditions when only the retailer considers fairness. Du et al. [13] improved the traditional fairness reference framework by constructing a Nash bargaining model. Zhang et al. [14] introduced retailer fairness concerns into closed-loop supply chain differential pricing, finding it beneficial for manufacturers. Li et al. [15] examined a scenario where manufacturers introduce direct channels and retailers add value to products while exhibiting fairness concerns, finding that channel efficiency increases with customer loyalty to retail channels but decreases with retailer fairness concerns. Yang et al. [16] studied cooperative advertising decisions in a distribution channel with a fairness-concerned retailer, analyzing the impact on decisions. Qin et al. [17] investigated how fairness concerns affect supply chain decisions under retailer bounded rationality, showing that fairness concerns increase supply chain profits and balance profit distribution between manufacturers and retailers. Nie et al. [18] examined quantity discount issues in a supply chain with one manufacturer and two retailers (one concerned only with fair distribution, the other also with peer fairness), coordinating the supply chain through quantity discount contracts combined with fixed fees. These studies incorporate fairness concerns into various supply chain structures, demonstrating significant impacts on members. However, manufacturer fairness concerns when facing powerful retailers, particularly when those retailers introduce store brands, require deeper investigation.

In summary, existing store brand research typically assumes rational economic agents, focusing on product positioning, consumer purchase factors, or post-introduction competitive games between manufacturers and retailers, while rarely addressing behavioral supply chain issues. Literature examining store brand introduction strategies under fairness concerns is particularly scarce. In practice, decision-makers are not always rational and are influenced by behavioral factors such as fairness concerns, risk preferences, and anchoring effects. In supply chains, members' fairness concerns may lead to decisions deviating from rational outcomes. How should members respond to irrational partners? This paper introduces fairness concerns into a two-level supply chain, considering a powerful retailer's store brand introduction strategy and manufacturer fairness concerns, establishing a Stackelberg game model and using backward induction to analyze the impacts on the supply chain.

The findings indicate that when manufacturers exhibit fairness concerns, wholesale prices and profit levels increase. Depending on competition intensity between the two products, store brands have varying effects on both parties.

1 Model Description

Consider a two-level supply chain consisting of a single manufacturer and a single retailer, where the retailer is the leader and the manufacturer is the follower. The manufacturer sells its national brand product to the retailer at

a wholesale price, and the retailer resells it to consumers. Simultaneously, the retailer considers whether to introduce a store brand that is substitutable for the manufacturer's product. As the follower, the manufacturer experiences feelings of "unfairness" regarding supply chain profit distribution. Based on whether the retailer introduces a store brand and whether the manufacturer exhibits fairness concerns, four supply chain models emerge: (1) No store brand introduction, no manufacturer fairness concern (NN model); (2) Store brand introduction, no manufacturer fairness concern (SN model); (3) No store brand introduction, with manufacturer fairness concern (NF model); (4) Store brand introduction, with manufacturer fairness concern (SF model). The following sections analyze the Stackelberg game equilibrium strategies under each model to identify mutually beneficial strategies.

1.1 Notation

The symbols used in this paper are defined in Table 1.

Table 1 Table of Notations

- ω : Manufacturer's wholesale price to retailer
- A : Market base demand for manufacturer brand and retailer store brand
- c_n, c_s : Production costs for manufacturer product and retailer store brand product
- θ : Consumer acceptance of retailer store brand product
- α : Manufacturer's fairness concern degree
- p_n, p_s : Market sales prices for manufacturer and retailer store brand products
- q_n, q_s : Market demands for manufacturer and retailer store brand products
- π_m, π_r, π_{sc} : Profits of manufacturer, retailer, and total supply chain
- u_n, u_s : Consumer utilities from purchasing manufacturer and retailer store brand products
- U_m : Utility function of fairness-concerned manufacturer

1.2 Model Assumptions

- a) Retailer store brand products are generally substitutes for manufacturer brand products, with lower quality and consumer acceptance [21]. Assume consumer valuation of manufacturer brand products is v , and valuation of store brand products is θv , with $\theta \in (0, 1)$, meaning consumers prefer manufacturer brand products under equal conditions, primarily because manufacturer brands are national brands with better quality and reputation guarantees.
- b) Following Mills' consumer purchase model [21], assume consumers' product valuation θ is uniformly distributed on $[0, 1]$, i.e., $\theta \sim U[0, 1]$. Consumer utility from purchasing manufacturer brand products is $u_n = v - p_n$, and from store brand products is $u_s = \theta v - p_s$. Therefore, consumers purchase

manufacturer brand products when $u_n > 0$ and $u_n > u_s$, and purchase store brand products when $u_s > 0$ and $u_s > u_n$.

- c) Based on assumption (a) that manufacturer brand product quality exceeds store brand quality, assume manufacturer brand production cost exceeds store brand cost, i.e., $c_n > c_s$. Similarly, Bontems et al. [22] argue that manufacturer and store brands have different marginal costs that increase with product quality. Mills [21] assumed identical variable costs but higher fixed costs for manufacturer brands due to marketing expenses. In practice, retailer store brands achieve lower costs primarily through savings in logistics, transaction, and promotional expenses.
- d) The fairness-concerned manufacturer's utility function adopts relative fairness: $U_m = \pi_m - \alpha(\pi_r - \pi_m)$, where $\alpha > 0$ is the manufacturer's fairness concern coefficient. Larger α indicates deeper fairness concerns. Li et al. [15] specified the utility function as $U_r = \pi_r - \alpha(\gamma\pi_r - \pi_m)$, where α represents inequality aversion (the fairness concern coefficient) and γ represents the retailer's perception of fair profit distribution. When $\gamma = 1$, this reduces to our utility function.
- e) If the manufacturer exhibits fairness concerns, the retailer seeking long-term stable cooperative relationships will consider manufacturer fairness, incorporating fairness concerns into its decision-making.

1.3 Demand and Objective Functions

- a) When the retailer does not introduce a store brand, only manufacturer brand products exist in the market. Based on previous assumptions, consumers purchase only when utility from manufacturer brand products is positive, i.e., $u_n > 0$. Therefore, demand for manufacturer brand products is $q_n = A - p_n$. Due to fairness concerns, the manufacturer's objective function is $U_m = \pi_m - \alpha(\pi_r - \pi_m)$, while the retailer's objective function is its profit function $\pi_r = (p_n - \omega)q_n$. The manufacturer's profit function is $\pi_m = (\omega - c_n)q_n$.
- b) When the retailer introduces a store brand, both manufacturer brand and store brand products coexist. Consumer utilities are $u_n = v - p_n$ for manufacturer brand and $u_s = \theta v - p_s$ for store brand. Based on assumption (b) conditions, demands for manufacturer and store brand products are respectively:

$$q_n = A - \frac{p_n - p_s}{1 - \theta}$$

$$q_s = \frac{\theta p_n - p_s}{\theta(1 - \theta)}$$

The manufacturer's objective function remains $U_m = \pi_m - \alpha(\pi_r - \pi_m)$, where $\pi_m = (\omega - c_n)q_n$. The retailer, with additional store brand revenue, has objective function $\pi_r = (p_n - \omega)q_n + (p_s - c_s)q_s$.

2 Supply Chain Game Model Analysis

Superscripts “NN,” “SN,” “NF,” and “SF” denote: no store brand, no fairness concern (NN model); store brand introduction, no fairness concern (SN model); no store brand, with fairness concern (NF model); and store brand introduction, with fairness concern (SF model). The following sections analyze equilibrium strategies under each model.

2.1 No Store Brand, No Fairness Concern (NN Model)

In this scenario, the retailer does not introduce a store brand and the manufacturer exhibits no fairness concerns, leaving only manufacturer brand products in the market. The game sequence is: the retailer (leader) first sets the manufacturer brand retail price, then the manufacturer sets the wholesale price. Backward induction yields Proposition 1.

Proposition 1. In the NN model, the optimal decisions for retailer and manufacturer are:

$$\omega^{NN} = \frac{A + 3c_n}{4}, \quad p_n^{NN} = \frac{3A + c_n}{4}$$

Corollary 1. In the NN model, manufacturer brand sales volume is $q_n^{NN} = (A - c_n)/4$; manufacturer, retailer, and total supply chain profits are respectively:

$$\pi_m^{NN} = \frac{(A - c_n)^2}{16}, \quad \pi_r^{NN} = \frac{(A - c_n)^2}{8}, \quad \pi_{sc}^{NN} = \frac{3(A - c_n)^2}{16}$$

Corollary 1 shows that in the NN model, the retailer captures 2/3 of total supply chain profits while the manufacturer receives only 1/3, creating significant distribution inequality due to channel power differences. This inequality may trigger fairness concerns for the disadvantaged manufacturer.

2.2 Store Brand Introduction, No Fairness Concern (SN Model)

In the SN model, the retailer introduces a store brand while the manufacturer exhibits no fairness concerns, offering consumers two competing products. The game sequence is: the retailer first determines retail prices for both manufacturer and store brand products, then the manufacturer sets its wholesale price.

Proposition 2. When $\theta \in [0, \theta^*)$, the retailer cannot introduce a store brand; when $\theta \in (\theta^*, 1]$, there exists θ^* such that store brand introduction is viable.

Proof: Constructing a Lagrangian function from the retailer's profit with the constraint of positive store brand demand yields Kuhn-Tucker conditions. Two cases emerge:

1. When $\mu = 0$, solving $\partial\pi_r^{SN}/\partial p_s = 0$ gives $p_s = (A\theta + c_s)/2$. Substituting into the constraint yields $(A\theta - c_s) > 0$, indicating positive store brand demand and successful introduction.
2. When $\mu > 0$, the constraint binds with $q_s = 0$, giving $p_s = \theta p_n$. Solving yields $p_n = (A + c_n)/2$ and $p_s = \theta(A + c_n)/2$, resulting in zero store brand demand and no introduction. QED.

Proposition 2 shows that when consumer acceptance of store brands is low, introduction fails. Only when acceptance exceeds a critical threshold can store brands be successfully introduced, particularly attracting price-sensitive consumers.

Proposition 3. In the SN model, when store brand introduction is viable, optimal decisions are:

$$\omega^{SN} = \frac{A + 3c_n - c_s}{4}, \quad p_n^{SN} = \frac{3A + c_n + c_s}{4}, \quad p_s^{SN} = \frac{A\theta + c_s}{2}$$

Corollary 2. In the SN model, sales volumes and profits are:

$$q_n^{SN} = \frac{A - c_n - c_s + A\theta}{4(1 - \theta)}, \quad q_s^{SN} = \frac{A\theta - 2c_s + c_n\theta + c_s\theta}{4\theta(1 - \theta)}$$

$$\pi_m^{SN} = \frac{(A - c_n - c_s + A\theta)^2}{16(1 - \theta)}, \quad \pi_r^{SN} = \frac{(A\theta - c_s)^2}{8\theta} + \frac{(A - c_n - c_s + A\theta)^2}{16(1 - \theta)}$$

$$\pi_{sc}^{SN} = \frac{(A\theta - c_s)^2}{8\theta} + \frac{3(A - c_n - c_s + A\theta)^2}{16(1 - \theta)}$$

Proposition 3 reveals that manufacturer brand wholesale and retail prices decrease with θ ; as product substitutability increases, manufacturer brand prices fall due to intensified competition, benefiting consumers. Conversely, store brand prices increase with substitutability, favoring retailers when consumers prefer store brands, though exacerbating manufacturer unfairness perceptions.

2.3 No Store Brand, With Fairness Concern (NF Model)

In this model, the retailer does not introduce a store brand but the manufacturer exhibits fairness concerns, leaving only manufacturer brand products. The game sequence is: the retailer sets the manufacturer brand retail price based on its

profit function, then the manufacturer sets wholesale price based on its utility function. Backward induction yields:

Proposition 4. In the NF model, optimal decisions are:

$$\omega^{NF} = \frac{A + 3c_n}{4} + \frac{\alpha(A - c_n)}{4(1 + 2\alpha)}, \quad p_n^{NF} = \frac{3A + c_n}{4}$$

Corollary 3. In the NF model, sales volume is $q_n^{NF} = (A - c_n)/4$; profits are:

$$\pi_m^{NF} = \frac{(A - c_n)^2}{16} + \frac{\alpha(A - c_n)^2}{8(1 + 2\alpha)}, \quad \pi_r^{NF} = \frac{(A - c_n)^2}{8} - \frac{\alpha(A - c_n)^2}{8(1 + 2\alpha)}, \quad \pi_{sc}^{NF} = \frac{3(A - c_n)^2}{16}$$

The retailer's pricing decision remains unaffected by manufacturer fairness concerns, leaving market prices and total supply chain profits unchanged. However, when retailers consider manufacturer fairness concerns, manufacturers gain improved profit allocation. As fairness concerns intensify (α increases), manufacturer profits rise while retailer profits decline, with manufacturer profits exceeding retailer profits when $\alpha > 1/2$.

2.4 Store Brand Introduction, With Fairness Concern (SF Model)

When the retailer introduces a store brand and the manufacturer exhibits fairness concerns, the game sequence is: the retailer first sets retail prices for both products, then the manufacturer determines its wholesale price. The demand functions yield:

Proposition 5. Consistent with the SN model, store brand introduction is viable when $\theta \in (\theta^*, 1]$. In the SF model, optimal decisions are:

$$\omega^{SF} = \frac{A + 3c_n - c_s}{4} + \frac{\alpha(A - c_n - c_s + A\theta)}{4(1 + 2\alpha)(1 - \theta)}$$

$$p_n^{SF} = \frac{3A + c_n + c_s}{4}, \quad p_s^{SF} = \frac{A\theta + c_s}{2}$$

Corollary 4. In the SF model, sales volumes and profits are:

$$q_n^{SF} = \frac{A - c_n - c_s + A\theta}{4(1 - \theta)}, \quad q_s^{SF} = \frac{A\theta - 2c_s + c_n\theta + c_s\theta}{4\theta(1 - \theta)}$$

$$\pi_m^{SF} = \frac{(A - c_n - c_s + A\theta)^2}{16(1 - \theta)} + \frac{\alpha(A - c_n - c_s + A\theta)^2}{8(1 + 2\alpha)(1 - \theta)}$$

$$\pi_r^{SF} = \frac{(A\theta - c_s)^2}{8\theta} + \frac{(A - c_n - c_s + A\theta)^2}{16(1 - \theta)} - \frac{\alpha(A - c_n - c_s + A\theta)^2}{8(1 + 2\alpha)(1 - \theta)}$$

$$\pi_{sc}^{SF} = \frac{(A\theta - c_s)^2}{8\theta} + \frac{3(A - c_n - c_s + A\theta)^2}{16(1 - \theta)}$$

Manufacturer brand sales volume is unaffected by fairness concern parameters but decreases with product substitutability. Store brand retail prices and sales volumes increase with θ , indicating that higher imitation levels of store brands benefit retailers.

3 Model Comparison and Results Analysis

Section 2 derived optimal decisions and profits under four models. This section compares decisions and profits across models to analyze impacts of store brand introduction and manufacturer fairness concerns.

3.1 Impact of Manufacturer Fairness Concerns

Comparing NF vs. NN models and SF vs. SN models yields Proposition 6.

Proposition 6. For $I \in \{N, S\}$ (where $I = N$ represents no store brand, $I = S$ represents store brand introduction): - $\omega^{IF} > \omega^{IN}$, $p_n^{IF} = p_n^{IN}$, $p_s^{IF} = p_s^{IN}$ - $q_n^{IF} = q_n^{IN}$, $q_s^{IF} = q_s^{IN}$ - $\pi_m^{IF} > \pi_m^{IN}$, $\pi_r^{IF} < \pi_r^{IN}$, $\pi_{sc}^{IF} = \pi_{sc}^{IN}$

Regardless of store brand introduction, manufacturer fairness concerns increase manufacturer brand wholesale prices while leaving retailer pricing decisions and product sales volumes unchanged. Manufacturers gain higher profits through increased wholesale prices, while retailer profits decrease, leaving total supply chain profits unchanged. Retailers transfer portion of manufacturer brand profits to manufacturers to accommodate fairness concerns and maintain long-term cooperation, without affecting store brand product metrics.

3.2 Impact of Retailer Store Brand Introduction

Comparing SN vs. NN models and SF vs. NF models reveals impacts of store brand introduction under different manufacturer fairness scenarios, summarized in Proposition 7.

Proposition 7. For $I \in \{N, F\}$ (where $I = N$ represents no fairness concern, $I = F$ represents fairness concern): - $\omega^{SI} < \omega^{NI}$, $p_n^{SI} < p_n^{NI}$, $p_s^{SI} > c_s$ - $q_n^{SI} > q_n^{NI}$ when $\theta > c_s/c_n$; $q_n^{SI} < q_n^{NI}$ when $\theta < c_s/c_n$ - $\pi_r^{SI} > \pi_r^{NI}$, $\pi_{sc}^{SI} > \pi_{sc}^{NI}$

Manufacturer profits: Comparing π_m^{SF} and π_m^{NF} yields $\Delta\pi_m = \pi_m^{SF} - \pi_m^{NF} = \frac{F(\theta)}{16(1-\theta)}$, where $F(\theta)$ is a quadratic function with discriminant $(2A\theta - 2c_s + c_n)\theta +$

$c_s \theta)^2 > 0$. Therefore, a threshold $\hat{\theta}$ exists in $(0, 1)$. When $\theta < \hat{\theta}$, $\Delta\pi_m < 0$ (store brand reduces manufacturer profit); when $\theta > \hat{\theta}$, $\Delta\pi_m > 0$ (store brand increases manufacturer profit). Similar analysis for $\pi_m^{SN} - \pi_m^{NN}$ yields analogous results. Thus, regardless of manufacturer fairness concerns, store brands benefit manufacturers when product substitution rates are high but harm them when substitution rates are low.

Retailer profits: When manufacturers do not consider fairness, $\pi_r^{SN} - \pi_r^{NN}$ has a negative denominator and a cubic numerator in θ . Analysis shows $\pi_r^{SN} > \pi_r^{NN}$ for all $\theta \in (0, 1)$. Similarly, when manufacturers exhibit fairness concerns, $\pi_r^{SF} > \pi_r^{NF}$. Therefore, store brand introduction always increases retailer profits.

Supply chain profits: The difference $\pi_{sc}^{SI} - \pi_{sc}^{NI}$ has a negative denominator. Analysis reveals two thresholds in $(0, 1)$, but store brand introduction increases total supply chain profits across the feasible range.

Store brand introduction intensifies competition, forcing manufacturer brand price and wholesale price reductions. While store brands capture some manufacturer market share, manufacturer product sales may not necessarily decline. Manufacturers attract consumers through lower prices, while store brands attract price-sensitive consumers. When store brand cost advantages are small, they may actually stimulate manufacturer brand sales. Interestingly, store brands enhance retailer and total supply chain profits by reducing double marginalization. For manufacturers, low substitution rates reduce profits, but high substitution rates create mutual benefits, increasing profits for both parties and total supply chain.

Proposition 8. When $\theta \in [0, \theta^*)$, the retailer's optimal strategy is "no store brand introduction" regardless of manufacturer fairness concerns. When $\theta \in (\theta^*, 1]$, the optimal strategy is "introduce store brand."

Manufacturer fairness concerns do not alter the dominant retailer's store brand strategy, which depends solely on consumer preference for store brands. Low acceptance leads to no introduction, while high acceptance enables successful store brand entry.

4 Conclusion

This paper examines store brand introduction by a powerful retailer considering manufacturer fairness concerns, comparing optimal decisions across four models to identify Stackelberg game equilibria. The study derives optimal decisions for manufacturers and retailers in each model, analyzes how fairness concerns and consumer acceptance affect decisions and profits, and identifies equilibrium strategy combinations under different conditions.

Key findings indicate that manufacturer fairness concerns primarily redistribute channel profits without changing total supply chain profits. Regardless of store

brand introduction, fairness concerns increase wholesale prices while leaving retail prices and sales volumes unchanged, transferring profits from retailer to manufacturer. Store brand introduction consistently enhances retailer and total supply chain profits by mitigating double marginalization. For manufacturers, store brands are detrimental at low substitution rates but beneficial at high rates, creating win-win scenarios where both parties' profits increase simultaneously.

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