

Optimal Channel Strategy in E-Commerce under Revised Consumer Preferences and Endogenous Commission Rates

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ABSTRACT

The rapid growth of e-commerce has fundamentally reshaped consumer shopping behavior, with online channels now surpassing physical retail in both usage and sales volume. This shift challenges traditional channel strategy models that assume consumers derive higher utility from offline shopping. Motivated by these changes, we investigated a manufacturer's optimal channel strategy in the context of e-commerce, considering marketplace selling, reselling, and dual-channel configurations. We developed a game-theoretic model featuring heterogeneous consumers who, unlike in prior studies, exhibit a stronger preference for online channels. Our key findings are as follows: (1) Under exogenous commission rates, the optimal strategy depends on the commission level, favoring marketplace selling at low rates, dual-channel at moderate rates, and reselling at high rates; (2) When commission rates are endogenous, platforms strategically lower commissions to retain the manufacturer, making marketplace or dual-channel strategies more attractive; (3) The presence of retailer competition shifts the optimal strategy toward reselling under exogenous rates and toward marketplace under endogenous rates; and (4) The dual-channel configuration yields the lowest profit when consumer online preference is moderate. This study contributes to the distribution channel literature by incorporating evolving consumer preferences, modeling commission rate endogeneity, and examining their joint influence on channel structure decisions in the digital marketplace.

Keywords: *Consumer channel preference, Dual-channel, Commission rate, Competition, Channel structure*

1. INTRODUCTION

With the rapid advancement of e-commerce over the past two decades, many manufacturers have transitioned from traditional reselling models to agency selling, whereby they sell directly on digital platforms and pay a commission fee in return. In this study, we refer to this arrangement as the marketplace model, following prior literature that equates agency selling, where the manufacturer sells directly on a platform and pays a commission fee, with marketplace formats (Tian *et al.*, 2018; Wei *et al.*, 2020). This transition signifies not only a structural change in distribution channels but also a fundamental shift in consumer behavior and retail dynamics.

In the early 2000s, it was widely assumed that consumers experienced diminished utility when shopping online, largely due to limitations in product inspection, trust, and overall customer experience (Chiang *et al.*, 2003). However, by 2025, this assumption has been fundamentally overturned. Today's consumers, particularly digital-native generations such as Millennials and Gen Z, increasingly perceive physical stores as less convenient, citing factors such as travel time, limited product information, and lack of real-time feedback as sources of disutility. This behavioral shift is well documented in academic literature, which emphasizes the rising appeal of online channels driven by their convenience, transparency, and features that enable social validation (Grewal *et al.*, 2017; Verhoef *et al.*, 2015). Complementing these academic findings, recent global surveys show that over 70% of Gen Z and Millennial consumers now regard online platforms as their primary shopping channel, even for high-involvement product categories such as electronics and fashion (Deloitte, 2022; McKinsey & Company, 2021). In response to these trends, traditional retailers like UNIQLO and Zara are expanding their digital footprints, while leading e-commerce platforms such as Amazon are simultaneously investing in physical store formats. These developments underscore the increasing

importance of dual-channel strategies (Yan *et al.*, 2024) and reflect a growing recognition among firms that optimal channel configurations must adapt to evolving market conditions, consumer preferences, and strategic platform behavior.

These shifts in consumer behavior raise important strategic questions for manufacturers deciding between traditional reselling through retailers and direct selling via online platforms. In the marketplace model, manufacturers set retail prices but pay commission to the platform. In the reselling model, they sell to retailers at a wholesale price, ceding control over final pricing. While reselling can lead to double marginalization from retailer markups, the marketplace allows full pricing control, albeit at the cost of potentially high commissions. Choosing the optimal channel requires careful consideration, especially under evolving consumer preferences and platform pricing strategies.

Adding to this complexity is the growing prevalence of dual-channel strategies, where manufacturers simultaneously engage in both reselling and marketplace channels. Though this hybrid approach can expand market reach, it also introduces risks of channel conflict and cannibalization. Moreover, commission rate endogeneity, where platforms adjust fees in response to manufacturer behavior—further complicates channel decisions, creating feedback effects that influence optimal strategy.

To examine these dynamics, we develop a stylized game-theoretic model involving a manufacturer, a digital platform, a retailer, and consumers with heterogeneous valuations and channel preferences. Departing from earlier studies that assume online shopping entails utility loss, we reflect current consumer behavior by modeling higher utility from online purchases and lower utility from offline channels. This revision accounts for modern frictions in physical shopping (e.g. travel time, limited product information) and the convenience of online platforms.

Our model yields several key insights. First, under exogenous commission rates, reselling can yield higher manufacturer profits, particularly when retailer competition is limited. However, under endogenous commission rates, platforms may reduce fees to retain manufacturers, making marketplace or dual-channel strategies more favorable. Second, retailer competition plays a critical role: under exogenous rates, it lowers retail prices and boosts reselling attractiveness, while under endogenous rates, it pressures platforms to reduce commissions, favoring marketplace adoption. Third, we uncover a non-monotonic relationship between consumer channel preferences and total profit: dual-channel strategies underperform when preferences are moderate but become more effective when preferences are strongly skewed toward either online or offline channels.

This study contributes to distribution channel strategy and platform economics in several ways. We (1) updated consumer channel preference modeling to reflect digital-era behavior, (2) incorporated commission rate endogeneity into platform-manufacturer interactions, (3) examined the interplay between retailer competition and commission structures, and (4) identified when dual-channel strategies may underperform, offering practical insights for firms navigating hybrid retail environments.

2. LITERATURE REVIEW

A growing body of work investigates the implications of marketplace or agency selling, where manufacturers sell directly through platforms and pay commissions, relative to traditional reselling, where retailers purchase products at wholesale and control retail pricing (Abhishek *et al.*, 2016; Tian *et al.*, 2018; Wei *et al.*, 2020). Studies in this stream highlight the trade-offs manufacturers face: agency selling enables pricing control but incurs platform fees, while reselling exposes firms to double marginalization yet offers wider distribution. For example, Chen *et al.* (2023) showed that a manufacturer's preferred model depends on consumer acceptance of online channels and spillover effects to offline sales. Similarly, Yu *et al.* (2020) emphasized the role of consumer channel preferences in determining optimal selling formats, and Tian *et al.* (2018) found that upstream competition among suppliers can render reselling more profitable than agency selling. Wei *et al.* (2020) further demonstrated that platforms may prefer reselling when manufacturers offer substitutable products, while Zhang and Zhang (2020) showed how information transparency affects a supplier's platform strategy.

Parallel to this, literature on channel configuration and choice explores how firms design, coordinate, and compete across multiple sales channels. Early work by Balasubramanian (1998) laid the foundation by examining coordination and conflict in dual-channel settings. Subsequent studies explore mechanisms to mitigate channel conflict (Eshghi & Ray, 2021), enhance coordination (Cai, 2010), and manage pricing and quality competition (Taleizadeh *et al.*, 2019). More recent research shifted focus toward omnichannel strategies and platform entry. Dzyabura and Jagabathula (2018) found that the ability to offer exclusive products drives online firms to open physical outlets, while Arya and Mittendorf (2018) examined how tax policy and customer acquisition motivate similar transitions. Matsui (2020) and Gallego and Talebian (2019) explored pricing and contract decisions in multi-channel supply chains, noting the implications for profit distribution and coordination.

Despite these advances, most prior work treats platform commission rates as fixed and does not fully account for strategic platform responses to manufacturer behavior, nor has retailer competition been widely integrated into models of channel choice. We extend this literature by modeling endogenous commission setting, where platforms adjust fees to retain manufacturers, and by incorporating retailer competition—a critical but underexplored factor that reshapes channel profitability under both fixed and dynamic pricing regimes.

3. MODEL

Consider a setting in which a manufacturer distributes a product to consumers through two distinct channels: a reselling channel and a marketplace channel. In the reselling channel, the manufacturer supplies the product to a downstream retailer, who then sets the final retail price and sells it to consumers. In contrast, the marketplace channel allows the manufacturer to engage in direct-to-consumer sales via an online platform, wherein the manufacturer retains control over the retail price but pays a commission to

the platform for access to its consumer base. The manufacturer also has the option to adopt a dual-channel strategy, simultaneously operating on both channels. Under this configuration, consumers choose their preferred channel, reselling or marketplace, based on their individual utility.

The market consists of a continuum of consumers with total mass normalized to one, where each consumer demands at most one unit of the product and chooses whether to purchase based on the utility derived from the available channels. A consumer purchases through the channel that offers the highest non-negative utility. Consumers are heterogeneous in their valuations and perceive different levels of utility depending on the channel. This is because purchasing through the physical retail channel involves additional friction, such as travel inconvenience and limited product information, which result in a lower baseline utility relative to the online marketplace. Following Hsiao and Chen (2014) and Pan *et al.* (2022), we define consumer utility as follows. Let $v \sim U[0,1]$ denote a consumer's valuation of the product. The utility from purchasing via the marketplace (subscript m) is given by $U_m = v - p_m$, while the utility from purchasing via the retailer (subscript r) is $U_r = \delta v - p_r$. Here, p_m and p_r represent the retail prices in the marketplace and reselling channels, respectively. The parameter δ ($0 < \delta \leq 1$) captures the relative utility consumers derive from the reselling channel. The value of $\delta < 1$ reflects net disutility or frictions associated with offline shopping. These frictions are well-documented and may include both tangible costs, such as travel time and transportation expenses and intangible factors, such as limited store hours, narrower product selection relative to the online 'endless shelf,' and information asymmetries (e.g., difficulty accessing peer reviews or comparing prices) (Verhoef *et al.*, 2015). Conversely, a higher value of δ indicates reduced friction or strong experiential advantages associated with the offline retail experience. When $\delta = 1$, consumers are indifferent between the two channels in terms of utility. Consumers behave rationally and choose the channel that maximizes their utility. In a single-channel configuration $i \in \{m, r\}$, a consumer purchases if $U_i > 0$. In the dual-channel setting i , a consumer purchases via channel i if $U_i > U_{-i}$ and $U_i > 0$.

The profit functions for the retailer, manufacturer, and platform across different channel structures are summarized in Figure 1. Let π , Π , and $\hat{\Pi}$ represent the profits of the retailer, manufacturer, and platform. To avoid excessive use of subscripts while maintaining clarity, we employ a hat notation for the platform's profit. We further define $\Pi_{channel}$ as the total channel profit, which is the total profit accrued across all participants in the distribution system, that is the sum of the manufacturer's profit Π , the platform's profit $\hat{\Pi}$, and the retailer's profit π . A summary of all notation used in the model is provided in Table 1.

3.1 Reselling Channel

In the reselling channel, the manufacturer sells the product through the retailer. The manufacturer charges a wholesale price w , and the retailer charges a retail price p_r . Thus, given

the demand D_r , the profit of the retailer is $\pi_r = (p_r - w_r)D_r$. The manufacturer incurs a cost c for producing the product, and her profit is $\Pi_r = (w_r - c)D_r$.

The game sequence in the reselling channel is as follows: First, the manufacturer sets the wholesale price. Subsequently, the retailer determines the retail price based on the wholesale price. Once the retail price is established, consumers then decide whether to purchase the product.

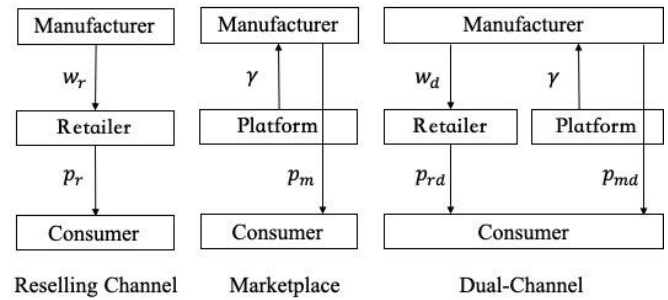


Figure 1 Model Structure.

3.2 Marketplace

In the marketplace channel, the manufacturer sells the product directly to consumers via the platform, retaining control over the retail price. The platform facilitates access to the consumer base and charges a commission fee at rate γ on each transaction. Consistent with prior literature (e.g., Hao & Fan 2014; Kwark *et al.* 2017; Tian *et al.* 2018; Hu *et al.* 2022), the baseline model assumes that the commission rate γ is exogenously given. In Section 5.1, this assumption is relaxed to allow for endogenous commission-setting by the platform, enabling an analysis of strategic free adjustments. Under the marketplace configuration, the manufacturer's profit is given by $\Pi_m = (1 - \gamma)p_m D_m$, and the platform's profit is $\hat{\Pi}_m = \gamma p_m D_m$.

The game sequence proceeds as follows: 1. The platform sets the commission rate γ , if endogenously determined; 2. The manufacturer chooses the retail price p_m ; 3. Consumers observe the price and decide whether to purchase based on their individual utilities.

3.3 Dual-channel

In the dual-channel, the manufacturer sells the product through both the platform and the retailer. This scenario combines elements from both the reselling channel and the marketplace. Thus, the profit of the retailer is $\pi_d = (p_{rd} - w_d)D_{rd}$, the profit of the platform is $\hat{\Pi}_d = \gamma p_{md} D_{md}$, and that of the manufacturer is $\Pi_d = (1 - \gamma)p_{md} D_{md} + (w_d - c)D_{rd}$.

The game sequence in the dual-channel is as follows: First, the platform decides the commission rate if it can. Then, the manufacturer establishes the wholesale price for the reselling channel. Subsequently, the retailer sets the retail price based on this wholesale price, while simultaneously, the manufacturer determines its retail price for sales on the platform within the marketplace. Based on these retail prices, consumers decide whether to purchase the product and, if so, through which channel.

Table 1. Summary of Notation

Notation	Description
U_m	Consumer utility in the marketplace
U_r	Consumer utility in the reselling channel
v	Consumers' product valuation
δ	Consumers' preference for purchasing from channels
p_m	Price in the marketplace
p_r	Price in the reselling channel
w	Wholesale price
c	Production cost
γ	Platform commission rate
D_m	Demand in the marketplace
D_r	Demand in the reselling channel
Π	Manufacturer's profit
π	Retailer's profit
$\hat{\Pi}$	Platform's profit
$\Pi_{channel}$	Total channel profit (i.e., $\Pi + \pi + \hat{\Pi}$)

4. MONOPOLY RETAILER

The analysis begins with a monopoly retailer operating in the reselling channel. Under this setting, a single downstream retailer interacts with the manufacturer, who must decide whether to sell through the reselling channel, the marketplace, or both (dual-channel configuration). This serves as the baseline for comparison before introducing retail competition in subsequent sections. Under the monopoly setting, equilibrium outcomes are derived for each channel structure, reselling, marketplace, and dual-channel. Then, profits for both the manufacturer and the retailer are compared across the three configurations to identify their respective channel preferences.

4.1 Exogenous Commission Rate

In this case, the commission rate is exogenous (Hao & Fan 2014; Kwark *et al.* 2017; Tianet *et al.* 2018; Hu *et al.* 2022). Following this assumption, we find that the optimal wholesale price and retail price are $w_r^* = \frac{\delta+c}{2}$ and $p_r^* = \frac{3\delta+c}{4}$ in the reselling channel. The optimal retail price in the marketplace is $p_m^* = \frac{1}{2}$. In the dual-channel, the optimal retail prices are $p_{md}^* = \frac{4(1-\delta)-r[4(1-\delta)+c]}{8[1-r(1-\delta)-\delta]-r^2\delta}$ and $p_{rd}^* = \frac{(4-r)(1-r)(1-\delta)\delta+c[2(1-r)-(2-r)\delta]}{8[1-r(1-\delta)-\delta]-r^2\delta}$. The optimal wholesale price is $w_d^* = \frac{(1-r)(1-\delta)[2(2-r)\delta+3c]+c(1-\delta-r)}{8[1-r(1-\delta)-\delta]-r^2\delta}$.

Based on the optimal decisions among these channels, we derive Proposition 1 by letting $\underline{\gamma} = \min\{\frac{2[2(1-\delta)+c]}{4-3\delta+c}, \frac{2}{\delta}[\sqrt{2(2-3\delta+\delta^2)} - 2(1-\delta)]\}$, showing the manufacturer's preferred channel.

PROPOSITION 1. When the commission rate is low, i.e., $\gamma \leq \underline{\gamma}$, the manufacturer is better off choosing the marketplace. When the commission rate is moderate,

i.e., $\frac{2c}{\delta} \leq \gamma \leq \underline{\gamma}$, the manufacturer is better off choosing the dual-channel. When the commission rate is high, i.e., $\gamma \geq \underline{\gamma}$, the manufacturer is better off choosing the reselling channel.

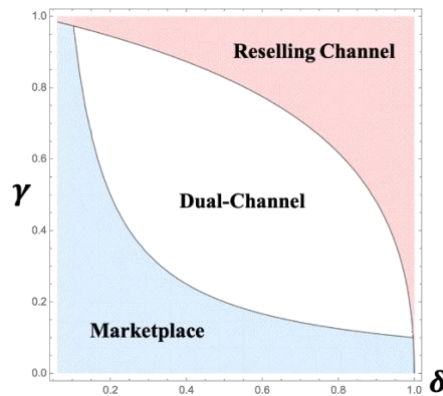


Figure 2 Manufacturer Optimal Strategy.

When the commission rate is low, the manufacturer benefits from this low rate and opts to sell the product directly in the marketplace. However, when the commission rate rises, the attractiveness of the marketplace diminishes due to higher commission. Thus, when the commission rate is moderate, the manufacturer, influenced by the commission costs, selects the dual channel. When the commission becomes excessively high, the manufacturer chooses to sell the product through the retailer.

Figure 2 also shows that with increases in the channel preference, the manufacturer is better off choosing the marketplace, dual-channel, and then reselling channel. The manufacturer balances the losses from the consumer's channel preference and wholesale price in the reselling channel against the commission losses in the marketplace. When consumers have a low preference for the retailer, they

indicate a higher inclination for online purchases, the marketplace becomes a more favorable choice for the manufacturer. However, when channel preference is moderate, the manufacturer considers the trade-offs between the wholesale price and the commission rate, typically leaning towards the dual-channel.

4.2 Exogenous Commission Rate

In this case, we endogenize the commission rate, and the results are shown in Lemma 1.

LEMMA1. Let $c_m = \sqrt{2(2 - 3\delta + \delta^2)} - 2(1 - \delta)$. When $c \geq c_m$, the optimal commission rate is $\gamma^* = \frac{\sqrt{2(2-3\delta+\delta^2)}-2(1-\delta)}{\delta}$. When $\frac{\bar{c}}{2} \leq c < c_m$, the optimal commission rate is $\gamma^* = \frac{2c}{\delta}$. When $c \leq \frac{\bar{c}}{2}$, the optimal commission rate is $\gamma^* = \bar{\gamma}$.¹

Lemma 1 demonstrates that the optimal commission rate is influenced by the production cost. When the production cost changes, the retailer adjusts the retail price accordingly, which affects demand. This shift in price and demand induces the platform to adjust the commission rate to maximize its profits.

Based on Lemma 1, we investigate the manufacturer’s channel preference, which is summarized in Proposition 2.

PROPOSITION 2. When $c \leq \frac{\bar{c}}{2}$, the manufacturer is better off choosing the dual-channel. When $c > \frac{\bar{c}}{2}$, the manufacturer is better off choosing the marketplace.

Proposition 2 shows that when the commission rate is endogenously set by the platform, the manufacturer does not choose the reselling channel. This outcome arises because the platform cannot extract commission revenue from transactions occurring in the reselling channel. Consequently, to incentivize the manufacturer to remain on the platform, the commission rate is strategically lowered, making the marketplace or dual-channel configuration more attractive to the manufacturer.

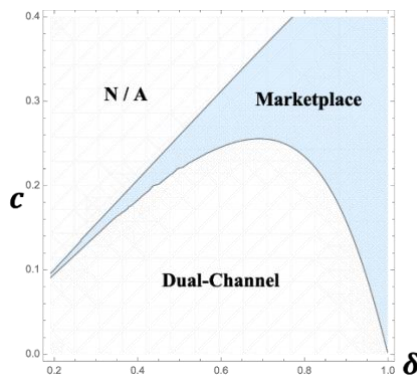


Figure 3 Manufacturer Optimal Strategy with Endogenous Commission Rate.

In addition, we observe that as the production cost increases, the manufacturer’s preference gradually shifts from the dual-channel configuration to the marketplace channel. This shift arises because higher production costs typically prompt the manufacturer to raise the wholesale price. In response, the retailer increases the retail price, which reduces consumer demand in the reselling channel. As retailer orders decline, the manufacturer finds the marketplace more attractive due to its direct access to consumers and greater pricing control. To ensure that the manufacturer has a valid choice between the dual-channel and the marketplace, a **feasibility condition** must be satisfied. When this condition is not met, the dual-channel structure is violated, leading to its collapse and the emergence of the “n/a” region depicted in **Figure 3**.

From Proposition 2, we derive one corollary to show the relationship between the optimal commission rate and consumer channel preference (and the production cost).

COROLLARY 1. (1) The optimal commission rate decreases with the consumer channel preference, i.e., $\frac{\partial \gamma^*}{\partial \delta} < 0$. (2) The optimal commission rate increases with the production cost, i.e., $\frac{\partial \gamma^*}{\partial c} > 0$.

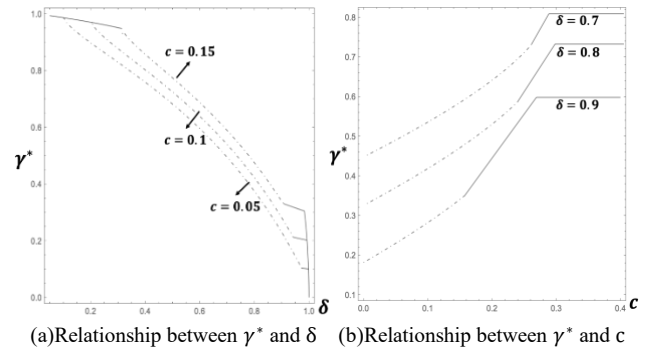


Figure 4 Optimal Commission Rate and Consumer Channel Preference (Production Cost).

Corollary 1 first shows that the high consumer channel preference leads to a high commission rate. Specifically, as the consumer channel preference for the retailer diminishes (δ is low), purchasing from the retailer becomes less attractive, thereby dissuading consumers. As a result, the platform obtains an increase in demand, leading to a higher commission rate.

Moreover, Corollary 1 indicates that the optimal commission rate increases with the production cost. An increase in production cost compels the manufacturer to set a higher wholesale price. As a result, the retail price on the reselling channel exceeds that of the marketplace. This price gap nudges consumers towards the marketplace, and the subsequent demand prompts the platform to raise its commission rate to optimize profit.

We further define $\bar{c} = \delta \bar{\gamma}$ as the threshold production cost below which the manufacturer prefers the dual-channel strategy over the marketplace.

¹Note that $\bar{\gamma}$ satisfies $\gamma^4 \delta [c^2 + c(8 - 7\delta) + 4(4 - 7\delta + 3\delta^2)] - \gamma^3 [4c^2(2 - \delta) + 8c(8 - 11\delta + \delta^2) + 8(16 - 36\delta + 25\delta^2 + 5\delta^3)] + \gamma^2(1 - \delta)(16 + 8c + c^2 - 26\delta - 6c\delta + 10\delta^2) - 32\gamma(1 - \delta)[c^2 + 6c(1 - \delta) + 2(1 - \delta)(6 - 5\delta)] + 64c(1 - \delta)^2 + 128(1 - \delta)^3 = 0$

We further delve into the impact of consumer channel preference on the total profit of the channel.

COROLLARY 2. In the dual-channel: With the consumer channel preference δ increasing, the total channel profit first decreases and then increases.

As shown in Figure 5, the channel profit is not strictly monotonic in the consumer channel preference. The underlying rationale is as follows. When the consumer channel preference is low (δ is high), channel heterogeneity is low. In this case, as the consumer preference decreases (δ increases), the perceived difference between the channels narrows for the consumers. This intensifies the competition between the price in the reselling channel and the marketplace, generally leading to lower prices and thus attracting more consumers. Consequently, the total channel profit rises. Conversely, when the consumer channel preference is high (i.e. δ is low), channel heterogeneity is high. The stronger differentiation between channels softens price competition, allowing higher prices and thus generating greater per-unit margins, which can also enhance total channel profit. In the analysis that follows, we denote the **optimal total channel profit** as $\Pi_{channel}^*$.

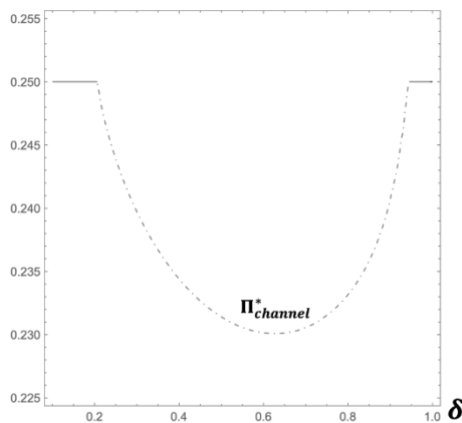


Figure 5 Relationship between Optimal Total Channel Profit and Consumer Channel Preference.

5. COMPETITIVE RETAILERS

Building on the monopoly retailer case in the previous section, this section considers a setting with competing retailers. The manufacturer now distributes the product through multiple retailers in the reselling channel. As before, the manufacturer chooses among three distribution strategies: exclusive reselling, marketplace, or dual-channel. The analysis proceeds in two stages. First, the manufacturer’s optimal channel choice is examined under an exogenous commission rate set by the platform. Then, the model is extended to allow the commission rate to be endogenously determined, providing insights into how retailer competition and platform pricing power jointly shape the manufacturer’s strategic preferences.

5.1 Exogenous Commission Rate with Retailers Competition

When the manufacturer sells the product through the two symmetric retailers in the reselling channel, the two

competing retailers would lower their retail prices to attract consumers. As a result, the retail prices would equal the wholesale prices, which leads to zero profits for the two retailers. In the marketplace, the manufacturer directly sells the products, a scenario similar to that discussed in Section 4. In the dual-channel, the manufacturer competes with the two retailers, which differs from the scenario in the previous section. Considering the competition of retailers, we find that the manufacturer’s optimal channel decision, which is shown in Proposition 3.

PROPOSITION 3. When the commission rate is low, i.e., $\gamma \leq \frac{2c}{\delta}$, the manufacturer is better off choosing the marketplace. When the commission rate is moderate, i.e., $\frac{2c}{\delta} \leq \gamma \leq \underline{\gamma}$, the manufacturer is better off choosing the dual-channel. When the commission rate is high, i.e., $\gamma \geq \underline{\gamma}$, the manufacturer is better off choosing the reselling channel.

Consistent with Proposition 1, in the absence of retailer competition, the manufacturer remains motivated to choose among the marketplace, reselling, and dual-channels. When the commission rate is low, the manufacturer is better off choosing the marketplace. When the commission rate is moderate, the manufacturer is better off choosing the dual-channel. And when the commission rate is high, the manufacturer is better off opting for the reselling channel. Interestingly, our findings suggest that the retailer competition can influence the manufacturer’s optimal channel choice. Specifically, the manufacturer is more inclined to select the reselling channel when retailers are highly competitive. This analysis and detailed information are summarized in Proposition 4.

PROPOSITION 4. Regardless of the degree of channel preference, due to competition between two retailers, the manufacturer prefers to choose the reselling channel over the monopoly retailer case.

In Figure 6, R_4^c denotes the expanded region where the manufacturer optimally chooses the reselling channel, relative to the monopoly model, due to competition from retailers.

As Figure 6 illustrates, compared to the scenario with a monopoly retailer, the manufacturer’s optimal channel choice shifts: it changes from the marketplace to the reselling channel when the consumer channel preference is high (δ is low) and from the dual-channel to the reselling channel when the consumer channel preference is low (δ is high). The reasoning is as follows. When the two symmetric retailers are in competition, they tend to reduce their retail prices to appeal to more consumers. This allows the manufacturer to charge a higher wholesale price, and the total demand of the reselling channel is also high. Thus, the manufacturer leans towards the retail channel, which, in turn, limits the attractiveness of the marketplace. Therefore, comparing to the monopoly, the manufacturer is less incentivized to opt for the marketplace and the dual-channel.

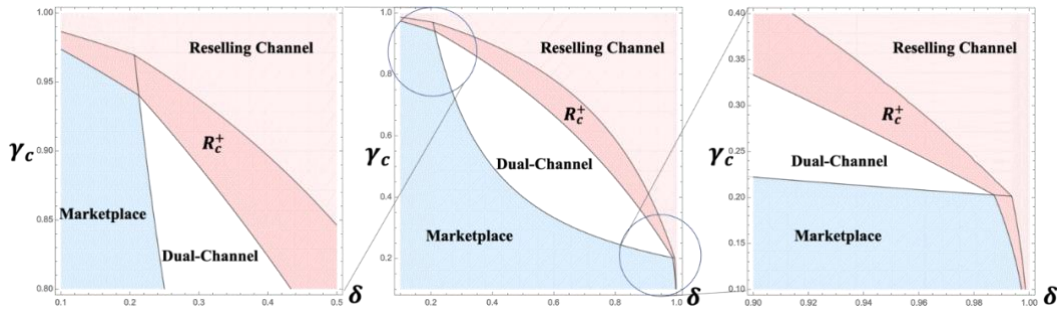


Figure 6 Manufacturer Optimal Strategy under Competition of Retailers.

5.2 Endogenous Commission Rate with Retailers Competition

In this case, we endogenize the commission rate when retailers are competitive. We denote the optimal commission rate as $\hat{c} = \sqrt{1 - \delta} - (1 - \delta)$, and present it in Lemma 2.

LEMMA 2. When $c \geq \hat{c}$, the optimal commission rate is $\gamma^* = \frac{2(\sqrt{(1-\delta)} - (1-\delta))}{\delta}$. When $\frac{\bar{c}}{2} \leq c \leq \hat{c}$, the optimal commission rate is $\gamma^* = \frac{2c}{\delta}$. When $c \leq \frac{\bar{c}}{2}$, the optimal commission rate is $\gamma^* = \bar{\gamma}^2$.

Lemma 2 shows the optimal commission rate given the production cost. By comparing this rate between the monopoly retailer and competitive retailers, we present our findings in Proposition 5, which illustrates the commission rate difference between the two cases. Let γ_m denote the optimal commission rate for the monopoly retailer, and γ_c as the rate for competitive retailers.

PROPOSITION 5. Compared to the monopoly case, the optimal commission rate is always lower in the competition case, i.e., $\gamma^* > \gamma_c^*$.

We present Proposition 5 in Figure 7. When determining the optimal commission rate, the platform knows that retailers sell at a lower price due to price competition, leading to increased sales in the reselling channel. Therefore, the platform has an incentive to reduce the commission rate in order to avoid the manufacturer abandoning the marketplace under a sharp decrease in demand in the online channel.

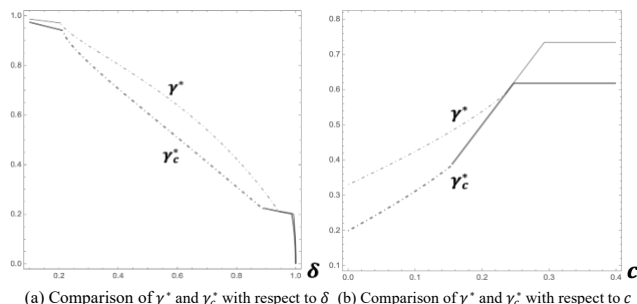


Figure 7 Optimal Commission Rates under Monopolistic Versus Competitive Retail with Channel Preference (Production Cost).

Next, we compare the manufacturer’s preferred channels under both monopolistic and competitive retailer scenarios to explore the impact of the competition on the manufacturer’s optimal channel decision. We detail the result in Proposition 6 and illustrate it in Figure 8.

PROPOSITION 6. Compared to the monopoly retailer case, the manufacturer is more likely to choose the marketplace in the retailer competition case.

In Figure 8, M_c^+ captures the additional region for the manufacturer’s optimal choice of reselling channel when retailers are competing. As noted in Proposition 5, the commission rate is lower when there is competition among retailers. This lower commission rate results in higher profits for the manufacturer. Therefore, the manufacturer is more inclined to choose the marketplace.

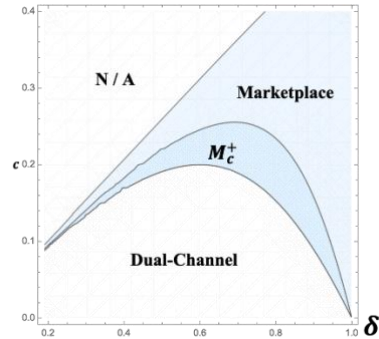


Figure 8 Manufacturer Optimal Strategy with Endogenous Commission Rate under Competition of Retailers.

COROLLARY 3. In the dual-channel with retailer competition, total channel profit may fall below that under monopoly. As consumer preference δ increases, it follows a similar non-monotonic pattern, first declining and then rising.

We now compare the total channel profit under dual-channel strategies between two retail market structures, monopoly and competition. As shown in Figure 9, even though both cases adopt the same dual-channel configuration, retailer competition does not always lead to higher total channel profit. The relative performance depends on the degree of consumer preference toward the offline channel, denoted by δ .

²Note that $\bar{\gamma}$ satisfies $\gamma^4 \delta [4 + c^2 + c(4 - 3\delta) - 6\delta + 2\delta^2] - 4\gamma^3 [4 + c^2 + c(4 - 3\delta - \delta^2) - 6\delta + \delta^2 + \delta^3] + 12\gamma^2 (1 - \delta)(4 + c^2 + 2c(2 - \delta) - 5\delta + \delta^2) -$

$$16\gamma(1 - \delta)[3 + c^2 + 3c(1 - \delta) - 5\delta + 2\delta^2] + 16(1 - \delta + c)(1 - \delta)^2 = 0.$$

When consumer preference for the offline channel is low, the demand from the retail side remains limited. In this setting, although competition among retailers eliminates double marginalization, the benefit is marginal because the offline sales volume is small. In contrast, under monopoly, the retailer can maintain a higher markup, which increases the price difference between online and offline channels. This incentivizes the manufacturer to raise the online price, and the platform reduces its commission rate to retain the manufacturer. These combined effects improve the total channel profit under the monopoly structure.

As the consumer preference δ increases, demand gradually shifts toward the offline channel. The relief of double marginalization in the competitive case becomes more significant due to the expanding base of offline transactions. Meanwhile, the manufacturer loses the ability to sustain a large price gap between channels, and the platform has less incentive to lower its commission rate. Eventually, the competitive retail structure surpasses the monopolistic one in generating total channel profit.

This finding implies that retailer competition is not unconditionally beneficial for total channel performance. When the platform endogenously sets the commission rate, the profit advantage of retailer competition only materializes when consumer preference for the retail channel is sufficiently strong.

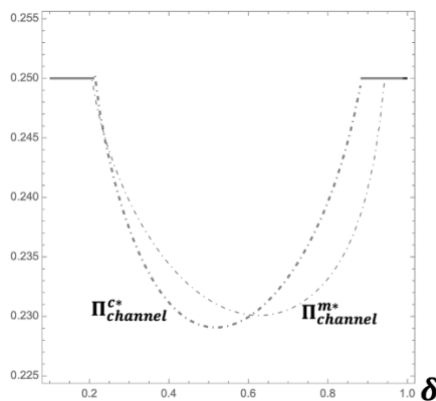


Figure 9 Relationship Between Optimal Total Channel Profit and Consumer Channel Preference under Monopoly and Retailer Competition.

6. MANAGERIAL IMPLICATIONS

This study offers several actionable insights for firms operating in platform-based commerce environments. First, manufacturers should not presume that intensified retailer competition inherently enhances reselling performance. Strategic adjustments in platform commission rates can lead to marketplace configurations that deliver superior profitability. Second, although dual-channel strategies provide broader market access, their effectiveness may be limited when consumer preferences are not distinctly aligned with a specific channel. Managers are therefore advised to carefully evaluate the distribution of consumer preferences prior to implementing hybrid channel structures. Lastly, platform operators may gain competitive advantage by maintaining adaptive and flexible commission policies,

which can help sustain key partnerships and respond effectively to dynamic market conditions.

7. CONCLUSION

As marketplace selling becomes increasingly prevalent among manufacturers, understanding the conditions under which it is preferable to the traditional reselling model is of critical strategic importance. While reselling is subject to double marginalization, leading to reduced demand and manufacturer profits, it allows the manufacturer to set wholesale prices, offering potential advantages. Thus, the manufacturer’s optimal channel choice hinges on the trade-off between profit erosion from double marginalization and pricing control under reselling.

The findings provide several important insights for understanding platform-mediated distribution strategies. First, the commission rate plays a pivotal role in determining the manufacturer’s channel preference. When the platform’s commission is exogenously fixed, reselling may be preferable. However, when the commission rate is endogenously determined, the manufacturer tends to avoid the reselling channel. This is because the ability to opt for reselling exerts downward pressure on the platform’s commission, increasing the appeal of the marketplace or dual-channel options. This finding underscores the strategic and regulatory importance of platform commission policies. Second, retailer competition has divergent effects depending on the commission structure. Under exogenous commissions, competition among retailers lowers final retail prices, enhancing the attractiveness of the reselling channel for the manufacturer. Conversely, under endogenous commissions, intensified retailer competition prompts the platform to reduce its commission rate, thereby making the marketplace more favorable. Third, the dual-channel strategy exhibits a non-monotonic relationship with consumer channel preference. When consumer preferences are moderate, price competition between the channels is most intense, eroding total profit. When preferences are strongly skewed toward one channel, the overlap shrinks, competition weakens, and total profit improves. While this U-shaped pattern is observed in both monopoly and competitive settings, the profit level under retailer competition does not always lead to higher profits. Retailer competition only improves overall channel performance when offline demand is sufficiently strong to offset the inefficiencies caused by double marginalization.

This research focuses on manufacturer and retailer preferences given fixed product quality. A promising direction for future research is to endogenize product quality and examine how it interacts with channel choice. Additionally, while this study considers retailer competition, extending the framework to include competition among manufacturers may yield further strategic insights into platform-based distribution channels.

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Appendix A: Proof of Main Model

Proof of Proposition 1.

We use backward induction to solve the game. First, we analyze the consumer's purchase choice. Then, we plug the demand into the profits of the retailer and the manufacturer and derive the optimal decisions.

Marketplace. In the marketplace, consumers buy the product from the manufacturer, and the net utility of the consumer is $U_m = v - p_m$. Since the rational consumers buy the product only when the net utility is non-negative, i.e.,

$U_m > 0$, we have that consumers with high product valuation will buy the product, and the demand is $D_m = 1 - p_m$. The profit of the manufacturer is $\Pi_m = (1 - \gamma)p_m(1 - p_m)$. Considering the first-order condition $\frac{\partial \Pi_m}{\partial p_m} = 0$, the manufacturer's optimal price is $p_m^* = \frac{1}{2}$. The optimal demand and the optimal profit of the manufacturer are $D_m^* = \frac{1}{2}$ and $\Pi_m^* = \frac{1-\gamma}{4}$.

Reselling Channel. In the reselling channel, the retailer, instead of the manufacturer, sell the product to consumers. The net purchase utility of the consumer is $U_r = \delta v - p_r$. The demand is $D_r = 1 - \frac{p_r}{\delta}$.

The profit of the retailer is $\pi_r = (p_r - w_r) \left(1 - \frac{p_r}{\delta}\right)$. Considering the first-order condition $\frac{\partial \pi_r}{\partial p_r} = 0$, we have the retailer's best response $p_r = \frac{w_r + \delta}{2}$. The profit of the manufacturer is $\Pi_r = (w_r - c) \left(1 - \frac{p_r}{\delta}\right)$. By solving $\frac{\partial \Pi_r}{\partial w_r} = 0$, we have that the wholesale price is $w_r^* = \frac{\delta + c}{2}$. The optimal price and demand are $p_r^* = \frac{3\delta + c}{4}$ and $D_r^* = \frac{\delta - c}{4}$. The profits of the retailer and manufacturer are $\pi_r^* = \frac{(\delta - c)^2}{16\delta}$ and $\Pi_r^* = \frac{(\delta - c)^2}{8\delta}$.

Additionally, when $p_r \leq p_m - (1 - \delta)$, the retailer's best response is $p_r = p_m - (1 - \delta)$. Because the manufacturer's profit will increase with wholesale prices. But $\pi_r \geq 0$ was satisfied, we know the wholesale price cannot be too high ($w_r \leq \delta + p_m - 1$). So, $w_r = \delta + p_m - 1$ substitute Π , calculate $\frac{\partial \Pi_r}{\partial p_m} = 0$, and get $p_m^* = \frac{2 - \delta + c}{2}$. Substituting p_m^* back to w_r , we get the same equilibrium solution, i.e., $w_r^* = \frac{\delta + c}{2}$ and $p_r^* = \frac{3\delta + c}{4}$.

Dual-channel. In the dual-channel, consumers can buy the product through the manufacturer or the retailer. In this case, the rational consumers buy the product not only when the net utility is non-negative but also higher than that of buying in other channels, $U_i > 0$ and $U_i > U_{-i}$, with $i \in \{m, r\}$. Thus, we find that: When $p_{md} - (1 - \delta) \leq p_{rd} \leq \delta p_{md}$ the demand in the reselling channel is $D_{rd} = \frac{p_{md} - p_{rd}}{1 - \delta} - \frac{p_{rd}}{\delta}$. And the demand in the marketplace is $D_{md} = 1 - \frac{p_{md} - p_{rd}}{1 - \delta}$.

The profit of the retailer and the manufacturer are $\pi = (p_{rd} - w_d) \left(\frac{p_{md} - p_{rd}}{1 - \delta} - \frac{p_{rd}}{\delta}\right)$ and $\Pi = (1 - \gamma)p_{md} \left(1 - \frac{p_{md} - p_{rd}}{1 - \delta}\right) + (w_d - c) \left(\frac{p_{md} - p_{rd}}{1 - \delta} - \frac{p_{rd}}{\delta}\right)$. Given the wholesale price and platform's price, we know retailer's best response is $p_{rd} = \frac{w_d + \delta p_{md}}{2}$. we plug the retail price p_{rd} into the manufacturer's profits. The manufacturer needs to trade off wholesale price w and platform's price p_{md} . As follows: $\Pi = (1 - \gamma)p_{md} \left[1 - \frac{w_d - (2 - \delta)p_{md}}{2(1 - \delta)}\right] + (w_d - c) \frac{\delta p_{md} - w_d}{2(1 - \delta)\delta}$. The optimal prices in Dual-channel correspond to the solution of the following quadratic program:

$$\max_{p_{md}, w_d} (1 - \gamma)p_{md} \left[1 - \frac{w_d - (2 - \delta)p_{md}}{2(1 - \delta)}\right] + (w_d - c) \frac{\delta p_{md} - w_d}{2(1 - \delta)\delta}$$

$$\text{s.t. } \frac{w_d}{\delta} \leq p_{md} \leq \frac{2 + w_d - 2\delta}{2 - \delta}.$$

We obtain the optimal solution to $w_d^* = \frac{4(1 - \gamma)(1 - \delta)[2(2 - \gamma)\delta + 3c] + c(1 - \delta - \gamma)}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$ and $p_{md}^* = \frac{4(1 - \delta) - \gamma[4(1 - \delta) + c]}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$,

which depends on the following condition:

$$\frac{2c}{\delta} \leq \gamma \leq \min\left\{\frac{2[2(1 - \delta) + c]}{4 - 3\delta + c}, \frac{2}{\delta} \left[\sqrt{2(2 - 3\delta + \delta^2)}\right]\right\}$$

The equilibrium solution and corresponding optimal profits are $p_{rd}^* = \frac{(4 - \gamma)(1 - \gamma)(1 - \delta)\delta + c[2(1 - \gamma) - (2 - \gamma)\delta]}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$, $D_{md}^* = \frac{4(1 - \gamma) - \delta(4 - 3\gamma) + c(2 - \gamma)}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$, $D_{rd}^* = \frac{(1 - \gamma)(\gamma\delta - 2c)}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$, $\pi_d^* = \frac{(1 - \gamma)^2(1 - \delta)(\gamma\delta - 2c)^2}{\delta[8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta]^2}$, and $\Pi_d^* = \frac{(1 - \gamma)[2(1 - \gamma)(1 - \delta)\delta - c(\gamma\delta - c)]}{\delta[8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$.

In contrast, when the condition of commission rate is $\gamma \geq \max\left\{\frac{2[2(1 - \delta) + c]}{4 - 3\delta + c}, \frac{2}{\delta} \left[\sqrt{2(2 - 3\delta + \delta^2)}\right]\right\}$, manufacturer's optimal channel strategy is reselling channel. When the condition of commission rate is $\gamma \leq \frac{2c}{\delta}$, manufacturer's optimal channel strategy is marketplace.

Proof of Lemma 1. We use the backward induction to solve the endogenous commission rate. Firstly, we analyze strategic equilibrium in Dual-Channel. Then, we plug the optimal price and demand into the platform's profits to derive the optimal solution. As follows: $\hat{\Pi} = \gamma p_{md} D_{md}$. The optimal commission rate corresponds to the solution of the following quadratic program:

Proof of Lemma 1.

We use the backward induction to solve the endogenous commission rate. Firstly, we analyze strategic equilibrium in Dual-Channel. Then, we plug the optimal price and demand into the platform's profits to derive the optimal solution. As follows: $\hat{\Pi} = \gamma p_{md} D_{md}$. The optimal commission rate corresponds to the solution of the following quadratic program:

$$\max_{\gamma} \gamma \frac{4(1 - \delta) - \gamma[4(1 - \delta) + c]}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta} \frac{4(1 - \gamma) - \delta(4 - 3\gamma) + c(2 - \gamma)}{8[1 - \gamma(1 - \delta) - \delta] - \gamma^2\delta}$$

$$\text{s.t. } \frac{2c}{\delta} \leq \gamma \leq \min\left\{\frac{2[2(1 - \delta) + c]}{4 - 3\delta + c}, \frac{2}{\delta} \left[\sqrt{2(2 - 3\delta + \delta^2)}\right]\right\}.$$

We obtain the optimal commission rate is γ^* which it satisfies $\gamma^4\delta[c^2 + c(8 - 7\delta) + 4(4 - 7\delta + 3\delta^2)] - \gamma^3[4c^2(2 - \delta) + 8c(8 - 11\delta + \delta^2) + 8(16 - 36\delta + 25\delta^2 + 5\delta^3)] + \gamma^2(1 - \delta)(16 + 8c + c^2 - 26\delta - 6c\delta + 10\delta^2) - 32\gamma(1 - \delta)[c^2 + 6c(1 - \delta) + 2(1 - \delta)(6 - 5\delta)] + 64c(1 - \delta)^2 + 128(1 - \delta)^3 = 0$, and $c \leq \frac{\delta\gamma^*}{2}$.

Therefore, corresponding platform's optimal profits is $\hat{\Pi}_d^* = \frac{\gamma^*[4(1 - \gamma^*)(1 - \delta) - \gamma^*c][4(1 - \gamma^*) + c(2 - \gamma^*) - \delta(4 - 3\gamma^*)]}{8[1 - \gamma^*(1 - \delta) - \delta] - (\gamma^*)^2\delta^2}$.

In contrast, when the production cost is $\frac{\delta\gamma^*}{2} \leq c \leq \sqrt{2(2 - 3\delta + \delta^2)} - 2(1 - \delta)$, optimal commission rate is $\gamma^* = \frac{2c}{\delta}$. Then, the optimal profits are $\Pi_d^* = \frac{\delta - 2c}{4\delta}$ and $\hat{\Pi}_d^* = \frac{c}{2\delta}$. When the condition of production cost is $c \geq \sqrt{2(2 - 3\delta + \delta^2)} - 2(1 - \delta)$, optimal commission rate is $\gamma^* = \frac{2(\sqrt{(1 - \delta) - (1 - \delta)})}{\delta}$. Then, the optimal profits are $\Pi_m^* = \frac{4 - 3\delta - 2\sqrt{2(2 - 3\delta + \delta^2)}}{4\delta}$ and $\hat{\Pi}_m^* = \frac{\sqrt{2(2 - 3\delta + \delta^2)} - 2(1 - \delta)}{2\delta}$. For two optimal commission rates, the manufacturer's optimal equilibrium channel strategy is marketplace.

To streamline the algebraic derivations in Lemma 1, we define $c_m = \sqrt{2(2 - 3\delta + \delta^2)} - 2(1 - \delta)$, $\gamma^* = \bar{\gamma}$, $\bar{c} = \delta\bar{\gamma}$. These notational simplifications facilitate a more concise

expression of the threshold conditions embedded in the platform’s optimal commission-setting behavior.

Proof of Proposition 2.

Building on Lemma 1, we know that the manufacturer prefers the dual-channel configuration over the marketplace when the production cost satisfies $c \leq \frac{\bar{c}}{2}$, where $\bar{c} = \delta\bar{\gamma}$ and $\bar{\gamma}$ is the platform’s optimal commission rate derived under the dual-channel setting. Conversely, when $c > \frac{\bar{c}}{2}$, the manufacturer switches to the marketplace strategy, as the dual-channel becomes less profitable.

However, to meaningfully compare the dual-channel and marketplace configurations, the reselling channel must remain a viable option, that is, it must offer strictly higher utility than the marketplace to at least some consumers. In the dual-channel setup, a consumer with valuation $v \in [0,1]$ compares $U_r = \delta v - p_r$ and $U_m = v - p_m$. The reseller attracts demand only if there exists some v such that $U_r \geq U_m$ i.e., $v(1 - \delta) \leq p_m - p_r$. Solving this yields the marginal consumer $v = \frac{p_m - p_r}{1 - \delta}$. To ensure that $v < 1$, a sufficient condition is $\delta > p_r - p_m + 1$. To conservatively approximate this condition, we let $p_m \rightarrow 0$, yielding $\delta > p_r + 1$. Given that equilibrium pricing in our model satisfies $p_r = w^* + c$, we obtain the sufficient feasibility condition $\delta > w^* + c$. When this condition fails, i.e., $\delta < w^* + c$, no consumer strictly prefers the retailer over the marketplace. In this case, the dual-channel effectively collapses into a pure marketplace, and the manufacturer faces no real strategic decision. This defines the “n/a” region in Figure 3.

Appendix B: Proof of Extension Model

Proof of Proposition 3.

We also used the backward induction method to solve the game. But the extension model is to analyze the competitive market of two retailers. The same is considered from the consumer’s purchase choice. Then, we plug the demand into the profits of the retailer and the manufacturer and derive the optimal solution.

Marketplace. The extension model is to analyze the competitive scenario of retailers. The marketplace is a direct channel. It is not affected by the middle of channel role, that is, retailers. Hence, the analysis results are the same as those of the main model. The consumers’ net utility is $U_m = v - p_m$. Since rational consumers buy the product only when the net utility is non-negative, i.e., $U_m > 0$, we have the demand in the marketplace, and same calculation process as the main model. We can know equilibrium solution and corresponding optimal profits are $p_m^* = \frac{1}{2}$, $D_m^* = \frac{1}{2}$ and $\Pi_m^* = \frac{1-\gamma}{4}$.

Reseller Channel. In the reselling channel, two symmetric retailers compete by lowering their retail prices to attract consumers. Due to this price competition, it is reasonable to assume that the equilibrium retail price converges to the wholesale price, i.e. $p_r^* = w_r$, resulting in zero profit for the retailers. Consumer utility from purchasing through the reselling channel is given by $U_r = \delta v - p_r$, leading to demand function of $D_r = 1 - \frac{p_r}{\delta}$. Substituting the

equilibrium retail price into the manufacturer’s profit function yields $\Pi = (w_r - c) \left(1 - \frac{w_r}{\delta}\right)$. Maximizing the manufacturer’s profit with respect to the wholesale price, we solve $\frac{\partial \Pi_r}{\partial w_r} = 0$, yielding the manufacturer’s optimal wholesale price, $w_r^* = \frac{\delta+c}{2}$. The corresponding equilibrium demand and manufacturer’s profit are $D_r^* = \frac{\delta-c}{2\delta}$ and $\Pi_r^* = \frac{(\delta-c)^2}{4\delta}$.

Dual-channel. In the dual-channel setting, when the price condition $D_{md} - (1 - \delta) \leq p_{rd} \leq \delta p_{md}$ is satisfied, the demand functions in the reselling channel are given by $D_{rd} = \frac{p_{md} - p_{rd}}{1 - \delta} - \frac{p_{rd}}{\delta}$, and $D_{md} = 1 - \frac{p_{md} - p_{rd}}{1 - \delta}$. Under retailer competition, the optimal retail price is $p_{rd}^* = w_d$. The manufacturer’s profit function is expressed as $\Pi_d = (1 - \gamma)p_{md} \left(1 - \frac{p_{md} - p_{rd}}{1 - \delta}\right) + (w_d - c) \left(\frac{p_{md} - p_{rd}}{1 - \delta} - \frac{p_{rd}}{\delta}\right)$. Substituting the optimal retail price into the profit function and solving, the manufacturer’s optimal wholesale price and marketplace price are derived as: $w_d^* = \frac{(2-\gamma)(1-\gamma)(1-\delta)\delta+c(2-2\gamma-2\delta-\gamma\delta)}{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta}$ and $p_{md}^* = \frac{2(1-\delta)-\gamma[2(1-\delta)+c]}{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta}$, which hold under the following condition on the commission rate:

$\frac{2c}{\delta} \leq \gamma \leq \min\left\{\frac{2[2(1-\delta)+c]}{2-\delta+c}, \frac{2}{\delta}[\sqrt{1-\delta} - (1-\delta)]\right\}$
 At equilibrium, the resulting demand in each channel and the manufacturer’s profit are: $D_{md}^* = \frac{2(1-\gamma)-(\delta-c)(2-\gamma)}{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta}$, $D_{rd}^* = \frac{(1-\gamma)(\gamma\delta-2c)}{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta}$, and $\Pi_d^* = \frac{(1-\gamma)[(1-\gamma)(1-\delta)\delta-c(\gamma\delta-c)]}{\delta\{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta\}}$.
 By contrast, when the commission rate satisfies $\gamma \geq \max\left\{\frac{2[2(1-\delta)+c]}{2-\delta+c}, \frac{2}{\delta}[\sqrt{1-\delta} - (1-\delta)]\right\}$, the manufacturer optimally selects the reselling channel. Conversely, if $\gamma \leq \frac{2c}{\delta}$, the marketplace becomes the preferred distribution strategy.

Proof of Proposition 4.

We compare the manufacturer’s channel preferences under two market structures: monopoly retailing versus symmetric retailer competition. For a fixed set of parameters (c, δ, γ) , we analyze how competition among retailers affects the manufacturer’s relative profitability under channel configurations that involve reselling. We first consider the reselling channel. In the monopoly setting, the retailer adds a markup to the wholesale price, inducing double marginalization that reduces both demand and the manufacturer’s profit. By contrast, in the competitive retailer case, the retail price converges to the wholesale price due to price competition. As a result, the manufacturer enjoys higher demand and can optimally raise the wholesale price. Algebraically, the closed-form expressions for the manufacturer’s profits in reselling under monopoly and competition can be compared as $\frac{(\delta-c)^2}{(8-4\delta)\delta} > \frac{(\delta-c)^2}{8\delta}$. This inequality shows that the manufacturer benefits specifically from retailer competition in the reselling channel. A similar result holds in the dual-channel configuration. The manufacturer’s profit under retailer competition is given by

$\frac{(1-\gamma)[(1-\gamma)(1-\delta)\delta-c(\gamma\delta-c)]}{\delta\{4[1-\gamma(1-\delta)-\delta]-\gamma^2\delta\}}$ which is strictly greater than the corresponding expression under monopoly $\frac{(1-\gamma)[2(1-\gamma)(1-\delta)\delta-c(\gamma\delta-c)]}{\delta\{8[1-\gamma(1-\delta)-\delta]-\gamma^2\delta\}}$. After taking a common denominator, the difference simplifies to a numerator of the form $(1-r)^2(1-\delta)(2c-r\delta)^2$ which is strictly positive. This confirms that the manufacturer's profit is uniformly higher under retailer competition, not only in the reselling channel but also in the dual-channel configuration.

Proof of Lemma 2.

Following the calculation process of Lemma 1 in the main model, we analyze the strategic equilibrium in the dual-channel. We plug the optimal price and demand into the platform's profits to derive the optimal solution. As follows: $\hat{\Pi} = \gamma p_{md} D_{md}$. The optimal commission rate satisfies the solution where $\frac{2c}{\delta} \leq \gamma \leq \min\{\frac{2[2(1-\delta)+c]}{2-\delta+c}, \frac{2}{\delta}[\sqrt{1-\delta} - (1-\delta)]\}$.

We obtain the optimal commission rate is γ^* which it satisfies $\gamma^4\delta[4+c^2+c(4-3\delta)-6\delta+2\delta^2] - 4\gamma^3[4+c^2+c(4-3\delta-\delta^2)-6\delta+\delta^2+\delta^3] + 12\gamma^2(1-\delta)(4+c^2+2c(2-\delta)-5\delta+\delta^2) - 16\gamma(1-\delta)[3+c^2+3c(1-\delta)-5\delta+2\delta^2] + 16(1-\delta+c)(1-\delta)^2 = 0$, and $c \leq \frac{\delta\gamma^*}{2}$. Therefore, corresponding platform's optimal profit is $\hat{\Pi}_d^* = \frac{\gamma^*\{2(1-\delta)-\gamma^*[2(1-\delta+c)]\}[2(1+c)-\gamma^*(2-\delta+c)-2\delta]}{4[1-\gamma^*(1-\delta)-\delta]-(\gamma^*)^2\delta^2}$.

In contrast, when production cost is $\frac{\delta\gamma^*}{2} \leq c \leq \sqrt{1-\delta} - (1-\delta)$, optimal commission rate is $\gamma^* = \frac{2c}{\delta}$. Then, the optimal profits are $\Pi_d^* = \frac{\delta-2c}{4\delta}$ and $\hat{\Pi}_d^* = \frac{c}{2\delta}$. When the condition of production cost is $c \geq \sqrt{1-\delta} - (1-\delta)$,

optimal commission rate is $\gamma^* = \frac{2(\sqrt{(1-\delta)}-(1-\delta))}{\delta}$. Then, the optimal profits are $\Pi_m^* = \frac{2-\delta-2\sqrt{1-\delta}}{4\delta}$ and $\hat{\Pi}_m^* = \frac{\sqrt{1-\delta}-(1-\delta)}{2\delta}$.

For two optimal commission rates, the manufacturer's optimal equilibrium channel strategy is marketplace.