

A Comparative Analysis of “Live Broadcast of Internet Celebrities” and Traditional Middlemen Sales Mode from the Perspective of Game Theory

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Abstract

At present, with the development of network economy, the live broadcast with goods sales model is more and more popular, and by many consumers. Based on the interest game under the hypothesis of “Economic man”, the analysis shows that the live broadcast of Internet celebrities, because of the “Flow” power, cooperate or conspire with the manufacturer, it can achieve vertical integration profit in the framework of manufacturer-retailer with low price strategy. It is concluded that compared with the traditional sales model of middlemen, “Live broadcast” can not only greatly increase the profits of the live broadcasters and their sales teams, but also enhance their cost and price advantages, there is money to be made in the collusion of the manufacturers with the live streaming of Internet celebrities.

Keywords

Live streaming; Manufacturer; Retailer; Price; Profit.

1. INTRODUCTION

With the development of network economy, the live broadcast with goods sales model is more and more popular, but also by many consumers. This model has also attracted the attention of more and more Internet celebrities, many Internet celebrities through cooperation or collusion with manufacturers, to join the live broadcast team, so that the traditional product sales model has become more and more diversified.

The traditional sales model of middleman is a kind of product transmission process with layer upon layer of mark-up, and it relies more on offline sales. However, the involvement of the live broadcast model of Internet celebrities has changed the framework of the original manufacturer as a retailer, and internet celebrities have become the “Retailers” for the sale of their products, and made its system profit situation has had the change.

At present, from the perspective of Game Theory and supply chain thinking on the network live broadcast research is obviously inadequate, only a few articles are also from a certain aspect or a certain industry to be analyzed. For example, Li Yumin and others, in order to discuss the choice of direct-broadcast marketing model for clothing E-commerce, they compared the expected sales and profits under different models, such as no-live-broadcast, independent-live-broadcast, invite-anchorperson cooperation, etc. , this paper analyzes the change of profit with the Elastic Coefficient of clothing price and the market share of traditional channel when the clothing e-commerce is on the air[1]. In this paper, Sun Hongxia and others, analyze the pricing decision-making problem of two-channel retailers and traditional retailers

in the supply chain system of single-manufacturer and two retailers with competitive behavior[2]. The general conclusion is that in the framework of manufacturer-retailer, monopoly power determines the size of the revenue.

In the framework of traditional manufacturer-retailer, the participation of middleman not only increases the consumer price, but also decreases the total profit of the industry. The purpose of vertical integration is to avoid multiple price distortions, manufacturers can take full vertical constraints and other measures, but they have their own shortcomings, in practical application is difficult to operate. Based on the game of interest under the hypothesis of "Economic man", because of the power of "Flow", the profit of the traditional "Manufacturer-like retailer framework" system is changed after cooperation or collusion with the manufacturer, that remains to be analysed in depth.

2. THE "DOUBLE MARK-UP" MODEL OF THE TRADITIONAL MIDDLEMAN SALES MODEL

In the framework of the traditional manufacturer-retailer, each middleman or retailer monopolizes a technology or privilege, this technology or privilege can transform a unit of intermediate products into a unit of consumer products. But there is competition among the downstream players (although manufacturers try to minimize this competition), and the downstream players are in a monopolistic competitive market.

If middlemen want to gain competitive advantage, they should not only consider differentiation strategy, but also pay attention to cost leadership. In the product chain of a retailer, the longer the chain is, the higher the price of the final product is, and the lower the product competitiveness is. Let's take a look at the "Double markup" problem through the simplest manufacturer-retailer model [4].

In a market where the manufacturer produces an intermediate product at a fixed unit cost c , the retailer obtains the product from the manufacturer at a price p_1 and faces the consumer directly at P ($P > p_1$). The final demand function of each retailer is assumed to be: $D_{(p)} = 1 - p$, the manufacturer's marginal cost per unit of product $c < 1$, and the retailer solves the profit maximization function $\max_p [(P - P_1)(1 - P)]$ and gets:

$$P = \frac{1 + p_1}{2} \quad q = \frac{1 - p_1}{2} \quad (1)$$

The profit of per retailer is:

$$\Pi_r = \left(\frac{1 - p_1}{2} \right)^2 \quad (i = 1, 2, 3, B, n) \quad (2)$$

The manufacturer solved:

$$p_1 = \frac{1 + c}{2} \quad (3)$$

So the optimal price for the retailer to sell the product is $P = \frac{3 + c}{4}$, the demand is $q = \frac{1 - c}{4}$, and the total profit of the integrated industry is:

$$\Pi^{ni} = \Pi_m + \Pi_r = \frac{(1 - c)^2}{8} + \frac{(1 - c)^2}{16} = \frac{3}{16}(1 - c)^2 \quad (4)$$

Now consider an integrated industry, for which each unit of input pays c , which solves $p = \frac{1+c}{2}$ for a total profit $\max_p [(p-c)(1-p)]$, total profit is $\Pi^i = \frac{(1-c)^2}{4} > \Pi^{ni}$.

Obviously, through the participation of middlemen, not only make consumer prices rise, but also reduce the total profits of the industry. The purpose of vertical integration is to avoid multiple price distortions, and manufacturers take full vertical constraints, such as the implementation of licensing fees or the use of fair-sale prices, but they have their own shortcomings, in practice it is difficult to manipulate. From the above analysis can also be seen, the profits of the downstream business is far lower than the profits of the upstream monopoly, in the monopolistic competitive market, this undoubtedly increases the risk of the downstream business, reducing its sales enthusiasm.

3. “LIVE BROADCAST” SALES MODEL

Because of the power of “Traffic”, the online celebrity broadcaster, after cooperating or colluding with the manufacturer, can get the manufacturer’s products at a lower price, thereby achieving better sales results with a low-cost strategy in the terminal sales, to a large extent, it can realize the vertical integration profit in the framework of manufacturer-retailer.

Assume that the price of the product obtained by the team from the manufacturer is equivalent to a discount on the original wholesale price with a discount rate of β ($0 < \beta < 1$). For the sake of brevity, it is not inconsistent to assume that manufacturers are not wholesaling their goods to other dealers or retailers, and that manufacturers in practice offer different models of the same product to other sellers. The previous model is still used for analysis.

At this point the take-out price or the wholesale price becomes $p_1 = \frac{1+c}{2}\beta$, because the wholesale price decreases will cause the final product the demand to increase, the product market demand becomes $q' = \frac{2-(1+c)\beta}{4}$, the retail price reduces to $p' = \frac{2+(1+c)\beta}{4}$.

The profits of the live streaming team have increased to:

$$\Pi'_r = \left(\frac{1 - \frac{1+c}{2}\beta}{2} \right)^2 = \frac{[2 - (1+c)\beta]^2}{16} \tag{5}$$

The total profits of the manufacturers fell to:

$$\Pi'_m = \frac{[(1+c)\beta - 2c][2 - (1+c)\beta]}{8} \tag{6}$$

For ease of comparison, consider $c = \frac{1}{2}$, $\beta = \frac{4}{5}$, there are:

(1) Lower purchase prices for consumers. The original $p = \frac{3+c}{4} = \frac{7}{8}$, current $p' = \frac{2+(1+c)\beta}{4} = \frac{4}{5}$, and consumer purchase prices dropped by 8.6%.

(2) Increased demand for commodities in the market. The original demand is $q = \frac{1-c}{4} = \frac{1}{8}$, the current demand is $q' = \frac{2-(1+c)\beta}{4} = \frac{1}{5}$. The market demand for this product has increased by 60%.

(3) The profit from live streaming of Internet celebrities has increased. Traditional retailers profit is $\Pi_r = \frac{(1-c)^2}{16} = \frac{1}{64}$, now live broadcast team profit is $\Pi'_r = \frac{[2-(1+c)\beta]^2}{16} = \frac{1}{25}$, sales profit growth of 156%.

(4) The total profit of the integrated industry is equal.

From the above comparison, the following conclusions can be drawn:

Conclusion 1: “Live broadcast” can reduce the market price and increase market demand. By virtue of the cost and price advantages, can fight against its similar products competitors. But in the supply chain system profits are relatively unchanged, “Live broadcast network” to gain profits is a complete transfer of the interests of manufacturers. Therefore, the “Live broadcast network” sales model for the live broadcast and consumers, is a better choice of consumption.

Conclusion 2: “Live broadcast” is characterized by low price strategy to stimulate consumer demand, so that the total profit of the industry has no big change compared with the integrated profit, therefore, to a certain extent, the integrated profit is realized.

Conclusion 3: The profit proportion relationship between manufacturer and retailer changes greatly. Under the traditional model, $\frac{\Pi_m}{\Pi_r} = 2$, under the “Live broadcast” model, $\frac{\Pi'_m}{\Pi'_r} < 1$, the industry profit moves down, which not only greatly reduces the live sales team’s operating risk, but also can increase its sales enthusiasm.

Although manufacturers can achieve their maximum profits by integrating into sales, and even recently there have been cases in which manufacturers have avoided “Intermediate links” to open direct-selling stores, it is more difficult to service low-price markets on their own. As a result, it is more appropriate for manufacturers to treat different retailers differently in different markets, discriminate in price and prevent arbitrage among middlemen by means of “Contract”.

As for the “Live broadcast” sales model, whether the manufacturer is not profitable? In fact, the red team from the manufacturers of goods from the low price for manufacturers is also profitable. Again, the above model is used to analyze the price elasticity of demand [5].

When manufacturers are vertically integrated, the Lerner Index is $\frac{p-c}{p} = \frac{1}{\varepsilon}$, where p is the price of profit maximization and the price elasticity of demand is ε .

Under the traditional sales model is not integrated, the known p_1 retailer chooses the consumer price p to maximize $(p-p_1)D(p)$, then get $p = \frac{p_1}{1-\frac{1}{\varepsilon}}$.

For $p_{(p_1)}$, $p' = \frac{dp}{dp_1} = \frac{1}{1 - 1/\varepsilon}$, this means that any increase in the first price is amplified by the

second distortion. The manufacturer maximizes $(p_1 - c)D_{(p_{(p_1)})}$, $p_1 = \frac{c}{1 - 1/\varepsilon}$, therefore,

$$p = \frac{c}{\left(1 - 1/\varepsilon\right)^2}, \text{ the Lerner index in the absence of integration is } \frac{p - c}{p} = \frac{2\varepsilon - 1}{\varepsilon^2}.$$

When the commodity is elastic ($|\varepsilon| > 1$), the Lerner Index is higher when the commodity is not integrated than when the commodity is integrated, the commodity price is higher, the demand is smaller, the industry profit is lower; when the commodity is inelastic ($|\varepsilon| < 1$), the Lerner index is lower than when the commodity is not integrated, profit margin is low, and the lack of flexibility of goods, industry profits are still low.

A small fall in the price of a manufacturer will have an effect on the price of a retailer, which increases demand and profits of the manufacturers, because $(p_1 - c) > 0$ and it will increase the profits of the industry. So for manufacturers, small price cuts can be profitable. Therefore, the "Live broadcast network" to give a discount, but also in the interests of the manufacturers.

Vertical integration does not increase the profits of another monopolist if there are a large number of retailers of the same product (including live webcasts) that are fully competitive, i.e. the market sells the product at marginal cost, competitive Sectors do not produce price distortions, and this kind of perfect competition imposes externalities on manufacturers, which will harm their interests. Therefore, manufacturers may give a certain retailer (such as a "Live broadcast") monopoly power to weaken the competition. Of course, a fully competitive market is impractical within the framework of a retailer as a manufacturer.

4. CONCLUSION

Through the analysis of the sales mode of "Live broadcast of Internet celebrities", it is concluded that "Live broadcast of Internet celebrities" will increase the market demand of the sales team, realize the increase of the profits of the integrated industry, and thus realize the problem of vertical integrated profits, and make live broadcast, consumers achieve win-win, can be a good solution to "Multiple mark-up" in a lot of problems. The "Live streaming" model is also profitable for manufacturers, in contrast to the "Double mark-up" of the traditional middleman sales model, "Live Broadcast Network" sales model in theory or practice have certain advantages, which is why this model is in the ascendant.

This model is simple and does not consider the transaction cost, incomplete contract and other factors, but the conclusions are very practical. Due to the variety of online and offline sales models, cost considerations and the need for competition, more and more manufacturers have started their own live sales attempts, but due to the differences in brand rating and traffic power, this pattern is not universal in common.

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