Consider Dual-channel Supply Chain Pricing and Coordination of Product Quality and Live Content

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Abstract. The explosive growth of the e-commerce industry has formed a certain competitive relationship with traditional online retail. This paper studies the pricing and coordination of the dual-channel supply chain of live streaming. Firstly, this paper constructs a demand function based on the live broadcast content and the quality of agricultural products, introduces the consumer's sensitivity coefficient to quality and commission rate to construct the profit function, secondly, constructs the Stackelberg game model to analyze the pricing strategy of live streaming, and finally, analyzes and verifies the case analysis. This paper draws some important conclusions about pricing strategies: (1) The higher the consumer's sensitivity to quality, the more likely it is to force suppliers to produce high-quality products. (2) The balanced live broadcast price is positively correlated with the content display effect of the anchor and the product quality, and the live broadcast room is not necessarily the lowest price; (3) Reasonable commission and quality cost sharing have a certain incentive effect on suppliers to produce high-quality products, and it is easy to achieve a win-win situation for the three.

Keywords: live streaming, influencer content display effect, product quality, pricing strategy

1 INTRODUCTION

After five years of rapid development, the market size of e-commerce live broadcast in 2023 has reached 4.9 trillion yuan, although there has been a certain decline compared with the early stage, but from the perspective of the entire market in 2023, the live broadcast industry is still a more prominent growth industry. Under the current economic environment, most residents are more cautious in consumption and tend to choose online shopping with higher cost performance. At the same time, "selling" influences consumers' impulse buying behavior[1-2] and is increasingly unrecognized. When the influencer realized that blindly waking up consumers could not achieve its effect[3], they began to pay attention to the interaction with consumers[4], and the real-time and interactive nature of live broadcast effectively conveyed product information[5], which is the key factor for consumers to trust and purchase products. According to the data released by the live broadcast platform in 2023, the number of people watching e-commerce live broadcasts on Douyin and Kuaishou alone reached

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563.53 billion, and the purchase conversion rate reached 4.8%, according to the survey, 78.1% of consumers are interested in product knowledge introduction in the process of product sales. At this time, consumers consider the brand value of the e-commerce platform and the quality of the manufacturer's products to make consumption decisions[6].

In order to better occupy the market and serve consumers, suppliers will open up online and offline channels at the same time, and compared with the single-channel supply chain model, the dual-channel supply chain model combining online and offline channels can better meet the different needs of the market and consumers. For example, Zhang et al[7]explored the strategy selection of members of the supply chain of fresh agricultural products under different sales models. Kenji M[8](2024)examines the way in which an agency sales or wholesale contract offered by an e-commerce platform that competes with a typical dual-channel supply chain without distinguishing between direct and indirect platform channels. Cao et al [9](2023) explored the optimal channel and logistics selection strategies for brands operating on the platform. Xu Xingxing[10] (2022) discussed the impact of free-riding behavior on the pricing and service level of each entity in the supply chain, and Gu et al. [11](2023) compared the impact of in-sale services on the optimal pricing of supply chain members under the cooperative and non-cooperative models. Furthermore, supply chain pricing and revenue sharing contracts are combined to explore reasonable pricing strategies under different constraint modes. Most researchers have discussed the shared green cost[12], preservation efforts[13], and low-carbon effects[14] to achieve "Pareto improvement" among supply chain members. Peng Liangjun [15](2023) discussed the impact of the contract on the optimal decision-making and profit of the live broadcast supply chain when the contract is determined by negotiation and non-negotiation between the two parties. Xiong Hao et al [16](2023) considered the characteristics of influencers to the pricing and coordination of the dual-channel supply chain of live streaming.

Through the collation of the above literature, it is found that most of the current articles on live streaming of products are based on the empirical analysis of the impact of influencers on consumers' purchase intentions, and lack the construction of live broadcast sales demand and profit function. Therefore, based on the dual-channel supply chain structure, this paper introduces the influencer content display effect and product quality to construct the demand function of the live broadcast channel, adopts the structure of "service fee + commission", introduces the service fee coefficient and commission rate to construct the profit function, and then based on the Stackelberg game theory, the reverse solution method is used to obtain the optimal pricing of the supply chain and the optimal influencer content display effect under the live streaming model, and analyzes the impact of product quality and content display effect on the decision-making of supply chain members.

2 PROBLEM DESCRIPTION AND MODEL ASSUMPTIONS

2.1 Problem Description

As live broadcast e-commerce enters a mature and standardized period, live broadcast practitioners have begun to shift to content-driven from the initial "selling" model

around influencers, including product details, sources, applicable groups and usage scenarios, etc., so more stringent requirements have been put forward for product traceability. This paper considers the impact of influencer content display effect and product quality on consumer purchase. After the introduction of the live channel, the dual-channel supply chain studied in this paper is shown in Figure 1. The supplier determines the quality q and wholesale price of the agricultural products and sells them to traditional online retailers, and the influencer decides the selling price p_2 of the live broadcast channel and the product content display effect e through the selling price p_1 of the traditional retailer. There is no middleman in the live broadcast channel to make the difference, However, the influencer will obtain the supplier's service fee and commission according to the sales volume brought by the influencer's display effect, of which the basic service fee coefficient τ and the commission rate r.

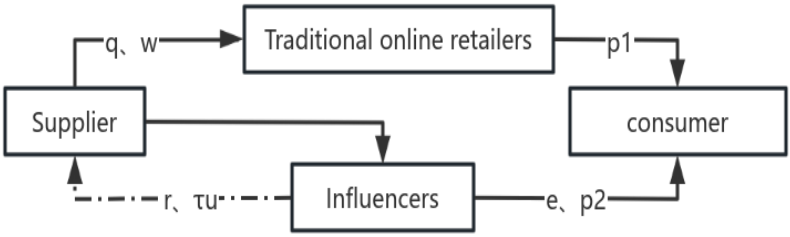

Fig. 1. The dual-channel supply chain structure of live streaming

2.2 Model Assumptions

The opening of live broadcast channels often grabs the market share of traditional online live broadcast rooms. Therefore, this paper assumes that there is a certain competitive relationship between the two channels, and the game relationship between the two channels is shown in Figure 2

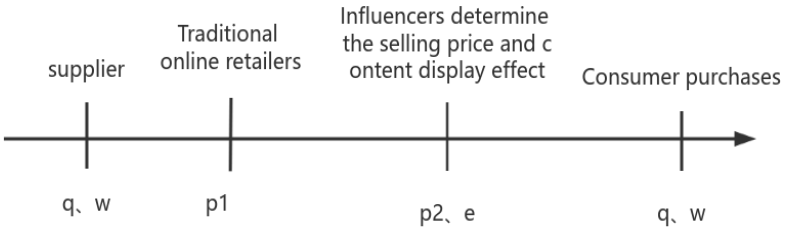

Fig. 2. The sequence of events

2.3 Model Parameter Setting

The specific parameters are shown in Table 1

Table 1. Model variables

variable	Variable description
r	Influencer commission rates
β	Cross-price sensitivity coefficient between channels
e	Content display effect
λ	The degree of consumer sensitivity to quality
k	Product quality cost factor
τ	The basic service fee coefficient determined by the vendor based on the influencer traffic effect
u	Influencer traffic conversion rate
π_r	the profits of traditional online retailers
π_w	Influencer profits
π_m	Supplier profits

3 DEMAND AND PROFIT ANALYSIS BASED ON THE QUALITY OF AGRICULTURAL PRODUCTS AND THE DISPLAY EFFECT OF INFLUENCER CONTENT

3.1 Demand Function

This paper hypothesizes that the demand for live streaming of agricultural products is mainly affected by the quality of agricultural products q and the influencer content display effect e. The content display effect of influencers will only be affected by those who enter the live broadcast room, so it will not affect the demand of traditional channels. According to the existing literature, the product demand function is also affected by the price of the product. In addition, considering the cross-price elasticity between channels, the demand function of traditional online retail channels is as follows

$$D_1 = a * D_0 - p_1 + \beta * p_2 + \lambda * q \tag{1}$$

β is the cross-price elasticity coefficient between channels, $\beta \in (0, 1)$.

Referring to Xiong Hao's [15] literature, it is assumed that the content display effect e of influencer products is linearly correlated with the demand for live broadcasting. The demand function of the live streaming channel is as follows

$$D_2 = (1 - a) * D_0 - p_2 + \beta * p_1 + \lambda * q + u \tag{2}$$

Among them, D_0 is the initial market demand, and a is the share of the initial market demand accounted for by traditional online retail channels.

3.2 Profit Function

Assuming that the profit of traditional online channel retail e-commerce only considers the demand and price difference of this channel, and does not consider product cost, customer conversion rate and goods holding cost, its profit function is expressed as follows

$$\pi_r = (p_1 - w) * D_1 \tag{3}$$

The streamer's profit is the service fee plus commission minus the cost of impressions. In Baogui Xin's[17] study, the commission rate was set at 30%, and this paper assumes 0<r<1/2. The service effort cost function of the influencer's content display is$C(e) = t * e^2/2$.

$$\pi_w = \tau * u + r * D_2 * p_2 - \frac{t*e^2}{2} \tag{4}$$

For suppliers, affected by two channels, the profit function is expressed as

$$\pi_m = D_1 * w + (1 - r) * D_2 * p_2 - \frac{t*q^2}{2} \tag{5}$$

In order to make the operation simple and at the same time accurate with reference to Xiong Hao literature, Ling, $D_0 = 1$. The two-channel demand function is further simplified，

$$D_1 = 1 - p_1 + \beta * p_2 + \lambda * q \tag{6}$$

$$D_2 = 1 - p_2 + \beta * p_1 + \lambda * q + e + u \tag{7}$$

The profit function is simplified to

$$\pi_r = (p_1 - w) * D_1 \tag{8}$$

$$\pi_w = \tau * u + r * D_2 * p_2 - \frac{t*e^2}{2} \tag{9}$$

$$\pi_m = D_1 * w + (1 - r) * D_2 * p_2 - \frac{t*q^2}{2} \tag{10}$$

4 COMPETITIVE GAME ANALYSIS

4.1 Stackelberg Game Analysis

This paper assumes that the supplier, as the leader of omni-channel, first determines the quality Q and wholesale price W, and the traditional retailer determines the retail price of the traditional channel according to the quality and wholesale price, and the influencer adjusts the live broadcast price P2 and the content display effect after seeing the retailer's decision. The reverse solution method is used to obtain the optimal decision and profit of channel members. The influencer profit function, π-w. Regarding the live

broadcast price, p-2. and the first-order optimal solution of the content display effect e is

$$\frac{\partial \pi_w}{\partial p_2} = r(1 - a + e + u + q\lambda + \beta p_1 - 2p_2) \tag{11}$$

$$\frac{\partial \pi_w}{\partial e} = rp_2 - et \tag{12}$$

Further the Hesse matrix can be obtained H=$\begin{vmatrix} -2r & r \\ r & -t \end{vmatrix}$. When $2rt - r^2 > 0$, there is a maximum. Ream $\frac{\partial \pi_w}{\partial p_2} = 0$, $\frac{\partial \pi_w}{\partial e} = 0$, the best result can be obtained

$$p_2^* = \frac{t(1-a+u+q\lambda+\beta p_1)}{2t-r} \tag{13}$$

$$e^* = \frac{r(1-a+u+q\lambda+\beta p_1)}{2t-r} \tag{14}$$

Bringing equations (13) and (14) into equations (9), the first-order optimal solution of the traditional network retail price p1 can be obtained

$$\frac{\partial \pi_r}{\partial p_1} = a + q\lambda - p_1 + \left(-1 - \frac{t\beta^2}{r-2t}\right)(p_1 - w) + \frac{t\beta(1-a+u+q\lambda+\beta p_1)}{2t-r} \tag{15}$$

$\frac{d^2\pi_r}{dp_1{}^2} < 0$, This shows that π_r is strictly concave with respect to p_1 and therefore has a maximum value for π_r. Reling $\frac{d^2\pi_r}{dp_1{}^2}$=0 can obtain the best retail price of the traditional network

$$p_1^* = \frac{a(r-t(\beta-2))+r(w+q\lambda)+t(-((1+u)\beta)+w(\beta^2-2)-q(2+\beta)\lambda)}{2(r+t(\beta^2-2))} \tag{16}$$

Combining equations (16), (13), and (14) into equation (10), and finding the second-order Heser matrix for quality q and wholesale price w for the supplier's profit function yields $\begin{vmatrix} -k - \frac{(r-1)t^2(r(2+\beta)+t(-4+(\beta-2)\beta))^2\lambda^2}{2(r-2t)^2(r+t(-2+\beta^2))^2} & A \\ A & -1 - \frac{t(-5t+r(2+t))\beta^2}{2(r-2t)^2} \end{vmatrix}$ At H>0, the Hesse matrix is negatively definite, so π-m. is a strict concave function about q and w, and there is a unique optimal solution.$\frac{\partial \pi_m}{\partial q} = 0$, $\frac{\partial \pi_m}{\partial w}$=0.The optimal threshold for finding the quality of the supplier and the wholesale price is

$$q^* = (((a(r^3 - t^3\,(6\beta^2 + \beta^4 - 8) + r^2\,t(-6 + \beta^2 - 4t(\beta^2 2 - 2)) + t^2\,r(4 - \beta^2 + 4t(-4 + 3\beta^2\,))) - t(1+u)(r^2(\beta + t(8 + 6\beta)) + rt((\beta - 4)(1+\beta)(2 + \beta) + 2t(-8 + \beta(-6 + \beta(2 + \beta)))) - t^2\,(-16 + \beta(-16 + \beta(2 + \beta(4 + \beta))))))\lambda)) / ((N_1 - (N_2 + N_3 + N_3 + N_4))\lambda^2 \tag{17}$$

$$w^* = ((-2t(1+u)(k\beta(r^2\,(1+2t) + t^2\,(8 - 3\beta^2\,) + rt(-6 + \beta^2 + t(-4 + \beta^2\,))) + (-1+r)t(2r + r\beta@ + t(-4 + (\beta - 2)\beta))\lambda^2) + 2a(k((r-2t)^3 + (r - 2t)t(r + 2(r-2)t)\beta) - (r-2t)t(r(t-1)+t)\beta^2 + t^2\,(r + (r-3)t)\beta^3) +$$

$$2(r-1)t^2\,(r(2+\beta)+t(-4+(-2+\beta)\beta))\lambda^2))) \,/\, ((N_1-(N_2+N_3+N_3+N_4))\lambda^2 \quad (18)$$

Thereinto A=$\frac{(r-2t)^3+t(2t-r)(r+2(r-2)t)\beta+t(r(t-1)+t)(2t-r)\beta^2-t^2\,(r+(r-3)t)\beta^3)\lambda}{2(r-2t)^2(r+t(\beta^2-2))}$,

$$N_1 = 2k\big(2(r-2t)^2+t\big(-5t+r(2+t)\big)\beta^2\big)\big(r+t(\beta^2-2)\big)$$

$$N_2 = r^3-r^2t(6-(\beta-2)\beta+4t(1+\beta)(2+\beta))$$

$$N_3 = rt^2(20+\beta(20+\beta-2\beta^2)+4t\big(4+\beta(6+\beta-\beta^2)\big)$$

$$N_4 = t^3(-24+\beta(-32+\beta(-2+\beta(8+\beta))))$$

The equilibrium solution can be obtained by combining Eq (13), (14), (16)~(18), and the demand function and profit function of Eq (6)~(10) to obtain the optimal profit of traditional online retailers, influencers, and suppliers.

4.2 Supply Chain Decision Analysis

According to the analysis of the game order above, the following propositions can be obtained

Proposition 1: The selling price p of retailers and influencers will increase with the increase of consumers' sensitivity to product quality λ. $p_2^* = \frac{t(1-a+u+q\lambda+\beta p_1)}{2t-r}$, $p_1^* = \frac{a\big(r+t(\beta-2)\big)+(w+q\lambda)+t\big(-((1+u)\beta)+w(\beta^2-2)-q(2+\beta)\lambda\big)}{2\big(r+t(\beta^2-2)\big)}$, It can be seen that the selling price of agricultural products is positively correlated with consumers' sensitivity to product quality.

Proposition 1 shows that when consumers are more sensitive to the quality of agricultural products, both traditional retail channels and online celebrity live streaming channels will increase the selling price. This will force suppliers to do their best to ensure product quality, thereby increasing consumers' willingness to buy, increasing market demand for products, and increasing the profits of various entities.

Proposition 2: The influencer content display effect e is positively correlated with consumers' sensitivity to product quality.

Bring (16) into (14) to obtain,

$$e^* = -((r(r-t(\beta^2-2))(k(-4(r-2t)(-1+a-u)+3a(r-2t)\beta + t(1-a+u)\beta^2+(2a-1-u)(r-t(2+\beta))\lambda^2))/(N_1-(N_2 + N_3+N_3+N_4))\lambda^2$$

Proposition 2 shows that consumers' sensitivity to product quality will promote the improvement of the influencer's content display effect, and the higher the influencer's content display effect, the more product information that the influencer can introduce, the more content-driven, and reduce the uncertainty of consumers' perception of products.

Proposition 3: The price of the product, p_2.The effect of the influencer's content displa e increases.

$$\text{Prove } \frac{\partial p_2}{\partial e} = \frac{t}{r} > 0$$

Proposition 3 shows that when the content display effect of the influencer is good, the influencer will increase the equilibrium price of the channel. As the influencer begins to pay attention to the meaning behind the product, it can convey to the audience a sense of spiritual gain in addition to placing orders with passion, so that consumers are more willing to pay for knowledge and feelings. For example, in the Dongfang Selection live broadcast room, the influencers represented by Dong Yuhui and Shi Ming will tell the customs and climate of each agricultural product in the live broadcast room, and will also write small essays on the spot, bringing consumers a different shopping experience, at the same time, the price of some products is slightly higher than that of ordinary live broadcast rooms.

5 NUMERICAL ANALYSIS

Considering the complexity of the model, this part explores the impact of the main parameters in the study on the pricing and profit of influencer content display effect through numerical analysis. Based on the above theoretical analysis, the set parameter values are reasonable and the practical significance of the analysis is ensured. In this section, six calculations are selected as shown in Table 2 to analyze the given examples, and the trend of the results is explored through the examples

Table 2. Study parameter

	τ	u	a	λ	r	β	k	t
exaple1	0.3	0.6	0.5	0.3	0.2	0.5	2	3
exaple2	0.3	0.6	0.5	0.35	0.2	0.5	2	3
exaple3	0.3	0.6	0.5	0.4	0.2	0.5	2	3
exaple4	0.3	0.6	0.5	0.3	0.25	0.5	2	3
exaple5	0.3	0.6	0.5	0.3	0.3	0.5	2	3
exaple6	0.3	0.6	0.5	0.3	0.35	0.5	2	3

In Table 2, based on the values of each parameter in Case 1, while keeping the other values unchanged, Case 2 and Case 3 increase the consumer quality sensitivity coefficient on the basis of Case 1. In examples 4~6, the commission rate coefficient is increased under the condition that the other parameter values remain unchanged, and the influence of the commission rate on each equilibrium solution is discussed. According to the construction model and the parameter values set above, the following table 3 is obtained.

Table 3. Equilibrium solution and optimal profit

	q^*	w^*	p_1^*	p_2^*	e^*	π_r^*	π_w^*	π_m^*
exaple1	0.203	0.689	0.839	0.817	0.054	0.020	0.309	0.583
exaple2	0.243	0.711	0.868	0.837	0.056	0.021	0.316	0.599
exaple3	0.287	0.738	0.903	0.862	0.057	0.024	0.324	0.617
exaple4	0.196	0.680	0.835	0.822	0.069	0.021	0.342	0.561
exaple5	0.188	0.671	0.831	0.827	0.083	0.022	0.375	0.537
exaple6	0.180	0.662	0.827	0.832	0.097	0.024	0.408	0.513

Combined with Tables 2 and 3, the following conclusions can be drawn,

(1) By observing the results of examples 1~3 in Table 3, it is found that when other parameters remain unchanged, the increase of consumers' sensitivity coefficient λ to product quality will promote the price and profit of the whole channel, which indicates that λ has a positive impact on the decision-making results of the supply chain, therefore, the supplier should improve the product quality, and the influencer should improve the content display effect, so as to expand the market demand and improve the total profit of the supply chain system. Consumers will measure the quality of the product by the product manual and the appearance of the product, and the title of the product will also attract consumers to buy, which shows that the finding is in line with reality.

(2) Through the observation of p_2^* and e^* columns, it is also found that the influencer price p_2 will increase with the increase of the influencer's content display effect E. This is because the display of high-quality content by influencers will increase demand, so the purpose of profit growth is achieved by increasing the selling price. At the same time, this also in turn prompts influencers to produce more high-quality content to maintain sales and profits, otherwise they have to reduce the price of sales. This is also the reason why content-based live streaming e-commerce such as Dongfang Selection or Yuhui peers tend to be more expensive, which is mainly driven by high-quality content, and consumers are willing to watch and pay for it. Compared with the previous "hawking" live streaming, content-based live streaming is easier to cultivate consumers into loyal customers.

(3) By observing the results of examples 4~6 in Table 3, it is found that when other parameters remain unchanged, the increase of commission rate will promote the content display effect of influencers, increase the selling price of influencer channels, and achieve the purpose of increasing profits, and will also increase the profits of traditional online retailers, mainly because the wholesale cost of retailers decreases, and the decline of the final selling price is smaller than the decrease of wholesale price. Supplier profits will decrease with the increase of commission rates, and at the same time, suppliers will not pay attention to product quality, resulting in lower wholesale prices, and the increase in selling prices of influencer channels cannot offset the decline in wholesale prices, so that suppliers fall into a vicious circle.

(4) Through examples 4~6, it is observed that with the increase of commission rate, the selling price p_2 of the influencer will gradually be greater than that of the traditional online retailer p_1. This is because the influencer is more likely to impress consumers and learn more comprehensive product information through good information

interaction with consumers, thereby increasing demand, and at this time, the influencer will increase the price to increase profits.

Based on the above conclusions, it can be concluded that the higher the consumer's sensitivity to the product, the more the supplier can improve the product quality, the improvement of product quality can increase the profit of the entire supply chain, and the increase of the commission rate will make the influencer tend to make a better content display effect, but it will damage the interests of the supplier. Therefore, this paper further analyzes the impact of the coordination contract between suppliers and influencers, i.e., commission rate and quality cost sharing, on the optimal profit of the two.

The supplier bears the quality cost coefficient of V1, and the online channel retailer bears the V2 proportion of the quality cost sharing coefficient, of which $v_1 > v_2$, the profits of online retailers, influencers, and suppliers in the coopetition supply chain are respectively

$$\pi_r = (p_1 - w) * D_1 - v_2 * \frac{k*q^2}{2} \tag{19}$$

$$\pi_w = \tau * u + r * D_2 * p_2 - \frac{e^2}{2} - (1 - v_1 - v_2)\frac{k*q^2}{2} \tag{20}$$

$$\pi_m = D_1 * w + (1 - r) * D_2 * p_2 - v_1 * \frac{k*q^2}{2} - \tau * u \tag{21}$$

According to the game sequence, the reverse solution method is adopted, which is the same as the above game order, and the optimal product quality, wholesale price, retail price of each channel and the optimal content display effect can be obtained. Then substituting it into the profit function can find the optimal profit function.

Figure 3 depicts the change in the profit of suppliers and influencers when the commission rate r and the supplier bear the quality cost ratio v1. It can be seen from the figure that with the increase of commission rate r, the profit of suppliers decreases, and the profit decreases more obviously when the proportion of quality cost v1 borne by suppliers is higher, but the profit of influencers will increase with the increase of quality bearing ratio and commission rate. When the commission rate r is less than a certain threshold, the supplier's profit is greater than the influencer's profit, and the supplier will bear a higher quality cost ratio v1, on the contrary, it is best for the influencer to bear most of the quality cost ratio v1 in the supply chain.

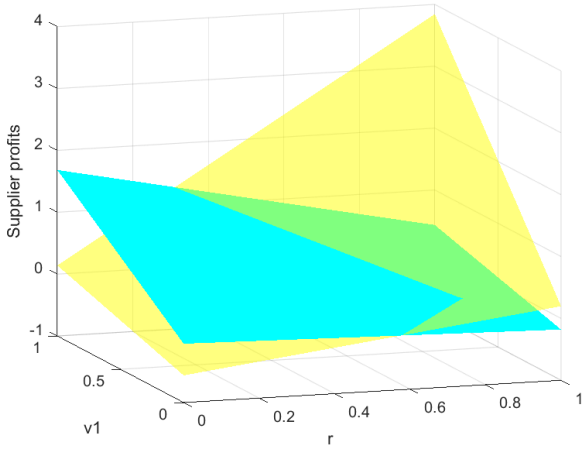

Fig. 3. The impact of v1 and r on supplier profits

6 CONCLUSION

As a new sales channel, live streaming is welcomed by consumers and suppliers. In addition to the price of the live stream, the quality of the product and the content displayed by the influencer will have a big impact on sales. Therefore, this paper considers consumers' sensitivity to product quality and the demand generated by the display of influencer content, constructs the demand function of live broadcast channels and traditional online retail channels, and introduces "commission + quality cost sharing" Then, the Stackelberg game model with suppliers as the leader, traditional online retailers and influencers as followers was constructed, and the relationship between consumers' sensitivity to product quality and the effect of influencer content display, as well as the relationship between them and price, was analyzed, and finally, the numerical test was carried out to verify the relevant conclusions. The conclusions of this paper enrich the research on dual-channel theory and provide a theoretical reference for enterprises involved in traditional online retail enterprises and enterprises with live streaming sales models.

The main conclusions of this paper are as follows, (1) Interestingly, not only will the profits of suppliers increase, but also the profits of anchors and retailers in traditional channels, so suppliers will contribute to the sharing of quality costs among all entities in the supply chain. (2) The content display effect of influencers is positively correlated with the equilibrium live broadcast price, which indicates that "the live broadcast price is not necessarily cheaper", and the content display and traffic of influencers tend to reduce consumers' sensitivity to price, and can generate greater demand. (3) Through "commission + quality cost sharing", the competitive supply chain can be effectively coordinated, and when the contract parameters meet certain conditions, the profits of suppliers, influencers, and traditional retailers can be improved.

Management enlightenment, (1) suppliers should look at product quality issues from a long-term perspective, and strive to build their own brands, so as to achieve the multi-dimensional improvement of "brand + market share + customer loyalty"; (2) As live streaming enters a standardized and mature period, the high quality of products, high prices, and the pursuit of live broadcast content should become a new positioning for practitioners. This new trend can make it a win-win-win situation for manufacturers, retailers, and consumers.(3) A certain proportion of "commission + quality cost sharing" with the influencer is conducive to achieving a win-win situation and achieving long-term cooperation. There are some limitations to this research project.

There are some limitations to this research project. This paper mainly considers the impact of anchor content display effect and consumers' sensitivity to product quality on demand and profit, and lacks the consideration of live content on consumer purchase factors, and subsequent research can be carried out on this basis.

REFERENCES

1. Zuo Jingjing, Li Yingying. The influence and mechanism of e-commerce influencer professionalism on consumers' impulse purchase behavior[J].Consumer Economy,2023,39(04):94-102.
2. Sun Kai, Liu Luchuan, Liu Chenglin. Impulsive purchase intention of live streaming e-commerce consumers from the perspective of emotion[J].China Circulation Economy,2022,36(01):33-42.DOI:10.14089/j.cnki.cn11-3664/f.2022.01.004.
3. Huang Wei, Wu Qi, Tian Meng. Research on the influencing factors of e-commerce live broadcast users' participation behavior from the perspective of interactive ritual chain[J].Modern Information,2024,44(01):71-82.
4. Duan Yongrui, Zhou Hao. Live broadcast decision-making and sales model selection considering the influence of information interaction and content[J].Journal of Systems Management,2023,32(05):865-879.
5. Sun Ruochen, Qu Hongjian. The Effect of Interactive Information on Consumers' Purchase Intention[J].Silk,2024,61(03):84-96.
6. Ni Xiao, Cheng Haifang, Liu Cong. Decision model of mixed sales channel considering consumer preference[J].Chinese Journal of Management,2020,17(10):1544-1553.
7. Zhang Fang, Liu Heming, Wu Jie. Comparison of supply chain sales models of fresh agricultural products considering live streaming[J].Computer Engineering and Applications,2023,59(23):293-304.
8. Kenji M .Should competing suppliers with dual-channel supply chains adopt agency selling in an e-commerce platform?[J].European Journal of Operational Research,2024,312(2):587-604.
9. Kaiying C ,Yuqiu X ,Ye H,et al. Supplier or co-optor: Optimal channel and logistics selection problems on retail platforms[J].European Journal of Operational Research,2023,311(3):971-988.
10. Xu Xingxing, Li Xueqin. Unified pricing and service decision-making of dual-channel supply chain under two-way free-rider behavior[J].Journal of Shandong University(Natural Science),2022,57(09):55-70.
11. Shu-Qin G ,Yong L ,Gang Z .Pricing coordination of a dual-channel supply chain considering offline in-sale service[J].Journal of Retailing and Consumer Services,2023,75

12. Zhou Hui, Liu Lu, Liu Jian. Green Supply Chain Decision-making and Cost Sharing Contract Based on Retailers' Overconfidence[J/OL].Journal of Systems Science,2024(03):110-115+130[2024-03-12].http://kns.cnki.net/kcms/detail/14.1333.N.20230907.1038.040.html.
13. Wang Wenlong, He Zhuyun, Zhang Shuxian. Research on the joint decision-making of fresh food dual-channel supply chain preservation efforts and promotion efforts from a dynamic perspective[J/OL].China Management Science,1-16[2024-03-12]. https://doi.org/10.16381/j.cnki.issn1003-207x. 2022.2070.
14. Sun Licheng, Guo Xiaoliang. Research on Dual-channel Publicity Decision and Coordination of Supply Chain Products Considering Low-carbon Reference Effect[J/OL].Control and Decision,1-9[2024-03-12].https://doi.org/10.13195/j.kzyjc.2022.2029.
15. Peng Liangjun, Liu Yawei, Zou Zichen, et al. Research on the selection of live broadcast supply chain coordination contract considering the prestige of influencers[J].Computer Engineering and Applications,2023,59(11):251-262.
16. Xiong Hao, Chen Jinyi, Yan Huili, et al. Pricing and coordination of dual-channel supply chain of live streaming with goods considering the characteristics of influencers[J].Journal of Management Engineering,2023,37(04):188-195. DOI:10.13587/j.cnki.jieem. 2023. 04. 016.
17. Xin Baogui, Hao Yaru & Xie Lei.(2023).Strategic product showcasing mode of E-commerce live streaming. Journal of Retailing and Consumer Services. doi:10.1016/J. JRETCONSER. 2023.103360.

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