Research on Pricing Decision of Supply Chain Channel for New Products Incubated by E-Commerce under Consumer Experience Preference

ISIKM2020
December 12-13, 2020

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Introduction

In the e-commerce market, brand entity manufacturers maximize their market share and enhance the aggregation of brand traffic by opening up dual channels. Under the effect of online Red flow, a large number of independent small capital brands which are not available for offline independent retailers are emerging. In the live network environment, they open up new brand images through network traffic, build their own small workshops, and form a vertical supply chain system of supply and marketing integration. With the formation of scale, they are no longer satisfied with online, but limited to the direct sales of retail physical stores. Under the influence of brand recognition of Benxi and offline consumers, they maximize their profits by not opening their own physical retail stores and not using other independent retail stores. However, when the new incubation products of fan economy form a certain market scale, under the dual influence of the consumer experience utility of online celebrity economy and the service experience utility of offline retailers, this supply chain coordination strategy will be constrained by the channel convenience, which is not conducive to the overall supply chain efficiency. Based on this, we establish a retail contract of consumer purchase behavior preference in the red man economy market. This paper discusses the optimal channel coordination and pricing strategy based on supply chain coordination channel model.

Research Questions

This paper studies the vertical supply chain composed of a manufacturer under the incubation of new e-commerce products, its direct sales channels, physical retail channels and the third-party retail channels it has. Based on the influence of different channel experience on the service cost of different channels, considering the constraints of the third-party offline retailers of incubated new products, and referring to the market expansion time series, the equilibrium game model is constructed to analyze the manufacturer's optimal pricing behavior under different distribution channel strategies.

Methodologies

Mathematical modeling,
Stackelberg game theory,
Numerical simulation

Table

Table 1 Model related parameter table

I = r, d, h, of which r said retail channels, d table direct channel h mixed channels	The size of the segment i, α_i = consumers
W = Wholesale price of products with independent retailers (assuming zero manufacturing cost)	θ = direct channel intensity relative to the retail channel preference
c_i = Additional cost of selling products through different channels	F (θ) = θ probability density function of uniform distribution on [1, 1], f (θ) = θ cumulative distribution function
c_r represents the offline sales effort service cost, c_d represents the online experience utility cost	A = preferred direct selling [-1,0], b= partial retail [0,1]
q_i=through channels I products demand	N is the distribution strategy: A is open only to the exclusive direct distributors, B is open to both channels of direct selling, and C is open to third-party retail
P_i = The price of the product sold through channel i	K channel structure: L for no third-party retailers, retailers Γ have a third party

Mathematical Formulas

There are many research work formulas, and we take the first type as an example to list the corresponding formulas

$$q_d=\alpha_d(1-p_d),\ p_d<\rho(1);\ q_{dh}^{+}=\gamma\alpha_d(1-p_d),\ p_d<\rho(2)$$

$$q_{dh}^{-}=(1-\gamma)\alpha_d[(1-(p_d+\theta^*)](3),\quad -\theta^*\le p_d<1-\theta^*$$

$$\theta^*=-\int_a^0\theta f(\theta|\theta<0)d\theta=-a/2$$

$$\pi_{(L,A)}^{M}=(p_d-c_d)q_T=(p_d-c_d)(\alpha_d+\alpha_h)[1-(p_d+(1-\gamma)(\alpha_h/(\alpha_d+\alpha_h))\theta^*)](4)$$

$$\frac{\partial\pi_{(L,A)}^{M}}{\partial p_d}=(\alpha_d+\alpha_h)[-2p_d^{(L,A)}+(1+c_d)]-(1-\gamma)(\alpha_h/(\alpha_d+\alpha_h))\theta^*$$

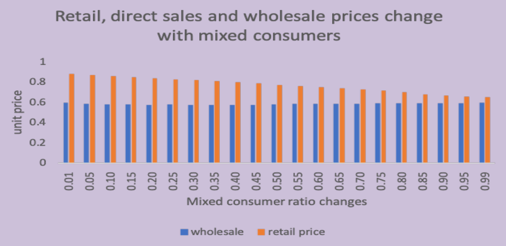
$$\partial^2\pi_{(L,A)}^{M}/\partial p_d^2=-2(\alpha_d+\alpha_h)<0(5)$$

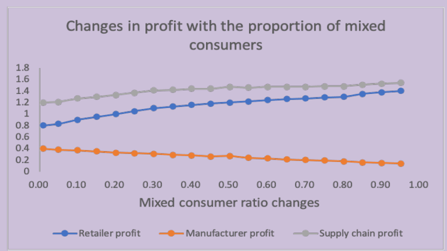
$$\frac{\partial\pi_{(L,A)}^{M}}{\partial p_d}=0,\ p_d^{*(L,A)}=\frac{1}{2}[(1+c_d)-(1-\gamma)(\alpha_h/(\alpha_d+\alpha_h))\theta^*](6)$$

$$\pi_{(L,A)}^{*M}=(\alpha_d+\alpha_h)(1-c_d-2\Delta)^2/4\ (7)$$

Figures

Opening up third party retail channel pricing behavior.





Conclusion

Through the simulation of the parameters of the above formula, it is concluded that the optimal price and profit are related to the scale of the mixed market segment. With the expansion of the mixed market scale and keeping the total market size unchanged, retailers will have to reduce their retail prices to compete with manufacturers' direct channels, because there are fewer retailers. Manufacturers charge the same wholesale price and direct price. With the expansion of the mixed consumer segment, manufacturers first reduce the wholesale price/direct price to attract more consumers and encourage more goods to be sold to consumers with retail intention. With the dominance of the mixed consumer market, manufacturers are trying to increase sales through retail channels and begin to increase wholesale and direct prices. With the decrease of the size of retail market segment, the profit of manufacturers increases, while that of retailers decreases. The final result is that the total profit of supply chain increases and decreases double marginalization due to the increase of direct channel sales. When $(\alpha_r+\alpha_h)$ is close to 1, due to the retail channel preference of some mixed consumers, the profit of the supply chain is close to that of the vertical integrated chain, but the profit loss is very small.