

Overview of Research on Dual-Channel Supply Chain Management

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Abstract. On the basis of systematically reviewing related literatures at home and abroad, this paper summarizes the current research on the selection of dual-channel supply chain, channel conflict, pricing strategy and coordination mechanism, and discusses the future research direction and hopes to lay a foundation for the follow-up research and development basis.

1. Introduction

With the rapid development of e-commerce and information technology, many well-known manufacturers (such as HP IBM Nike and Lenovo TCL, etc.) have been involved in e-commerce. They all began to increase the network direct sales channel based on traditional physical retail channels. The development of online sales channels has brought many benefits. On the one hand, direct sales network not only increases manufacturers' sales channels, but also reduces costs and increases efficiency so that it can achieve higher profits. On the other hand, direct sales channels provide consumers with more purchasing channels, saving time and increasing utility. However, the network direct marketing channel also brought some problems. The direct marketing channel exacerbated the market competition, resulting in the traditional retail channels to the network of direct sales channels to resist the phenomenon.

For the study of dual-channel supply chain management, foreign countries started from Balasubramanian^[1] on the price competition of dual channels in 1998. Since then, the research on dual channels in foreign countries has been increasing. The domestic market started from 2006 on the dual-channel supply chain management Research in recent years, with the continuous development of network technology, the research of dual-channel supply chain management has become one of the focuses of our country's scholars. Domestic and foreign research on dual-channel supply chain is mainly reflected in the decision-making of dual-channel supply chain, channel conflict of dual-channel supply chain, pricing strategy of dual-channel supply chain and coordination mechanism of dual-channel supply chain.

2. Research on dual-channel supply chain management

2.1 Research on dual-channel supply chain selection problem

Manufacturers can better understand consumers' needs and preferences through network direct sales channels and make more accurate forecasts of market demand accordingly. This not only improves consumer satisfaction but also improves market profitability. Therefore, the implementation of dual-channel supply chain has become a manufacturer to participate in market competition, a favorable means. However, some entity retailers began boycotting manufacturers' online direct sales channels. They thought that direct online sales channels pose a threat to physical retail channels, making the contradiction between dual-channel supply chains more prominent. This not only made the effect of dual-channel supply chain management impossible, but also led to the failure of the operation of the dual-channel supply chain. For example, photosynthesis, the largest private chain bookstore in China, had to declare a bankruptcy after the closure of all physical stores. Therefore, dual-channel supply chain management does not always have the advantage that manufacturers should consider whether they are in their own interests, whether it is acceptable to physical retail

stores, and the overall performance of supply chain channels. At present, the inquiry into the double-channel problem has drawn many scholars' deep research. Park and Keh^[2] believe that manufacturers choose online direct sales is conducive to their own improvement, the overall performance of dual-channel supply chain management will increase, but the profits of traditional retailers is reduced. Chiang et al.^[3] found that manufacturers have opened direct online channels to not only increase their own needs and profits, but also reduce the prices of traditional retailers. Chen Jing et al.^[4] think that the network direct sales channels not only help manufacturers to reduce costs, increase profits, but also to avoid physical retail store market control. Ferech et al.^[5] studied the issue of dual-channel distribution from the perspective of consumer purchasing behavior using structural equation modeling and multiple regression analysis. The results show that electronic distribution channels cannot completely replace traditional distribution channels, and consumers prefer dual-channel distribution models. Szmerekovsky et al.^[6] studied the decision-making problems of both manufacturers and retailers in advertising. Luo Meiling et al.^[7] analyzed the impact of bidirectional free riding on the pricing, service and profit of all parties in the dual-channel supply chain and studied the preconditions for manufacturers to launch the direct marketing network. Huang Song et al.^[8] showed that consumer preferences and demand changes will affect the price strategy of physical retail channels and the manufacturer's production strategy. Liu et al.^[9] pointed out that retailers will use price discrimination measures to boycott manufacturers to launch online direct sales channels, and this measure is extremely unfavorable to retailers. Chen Yuan et al.^[10] argue that the service competition of dual-channel supply chains makes the dual-channel supply chain superior to the single-channel supply chain, and when the consumer preference for online direct sales channels is higher, the profit of the dual-channel supply chain is higher high.

Nowadays, with the rapid development of e-commerce, there is a consensus that the dual-channel supply chain benefits both at home and abroad. It is believed that dual-channel supply chain is beneficial to increase the profits of manufacturers, but there are also some problems. What are the factors that affect the two-channel supply chain, and how to carry out the management of the dual-channel supply chain under the condition of win-win situation of both parties, and it has not been studied in depth. Therefore, the manufacturer of dual-channel supply chain needs further study.

2.2 Research on pairs of channels of supply chain channel conflict

In the dual-channel supply chain, manufacturers aim to maximize their own interests, making the contradiction between the dual marginal effects of the supply chain more prominent. As manufacturers and retailers sell the same products and serve the same customers, dual-channel leading to the loss of customers in the traditional physical retail stores, thereby affecting the effective operation of the dual-channel supply chain. Therefore, how to make manufacturers to improve their own interests while mitigating double-channel conflict is crucial. Webb and Kevin^[11] argue that online direct sales channels can reduce channel conflicts through sound pricing strategies and brand differentiation. Kumar et al.^[12] argue that manufacturers and physical retailers can benefit from dual-channel supply chains at the same time only if certain conditions are met. Cattani et al.^[13] pointed out that manufacturers can make the best of manufacturers, retailers and consumers by setting the right price. Cai Gangshu and Zhang^[14] argue that consistent pricing and price discounts can mitigate channel conflicts and improve the overall performance of the supply chain. Liang et al.^[15] pointed out that when the manufacturer's network direct selling cost satisfies a certain value, launching the online direct sales channel can benefit manufacturers, retailers and consumers together. Huang Guanghui et al.^[16] from the perspective of consumer choice behavior, study the conflict between manufacturers and retailers in the two-channel supply chain.

Channel conflict in dual-channel supply chains will lead to a loss of profit for manufacturers and retailers and a decrease in supply chain performance. The literature mainly analyzes how to reduce channel conflicts in terms of pricing, brand differentiation and channel costs. In fact, there are other factors influencing the two-channel supply chain, so in-depth study on reducing conflicts in the two-channel supply chain is needed.

2.3 Research on dual-channel supply chain pricing strategy

In the literature of dual-channel pricing strategy research, scholars generally first define the demand function. Demand in dual-channel mode is affected by many factors. There has not been a unified expression in the literature research all the time, because the different characteristics of the channels lead to the different definition and composition of the requirements. Dumrongsiri et al.^[17] studied the quality of service, the conditions for manufacturers to join the sales channel, and the dual-channel pricing strategy. Huang and Swaminathan^[18] studied a single-layer, dual-channel pricing strategy. Weitz et al.^[19] found that enterprises in the distribution through different channels to implement the same price strategy. Webb et al.^[20] think that the price difference between channels can be controlled within the appropriate range through the price corridor way to realize the differential pricing of channels. Kurata et al.^[21] considered pricing decisions for products in an environment where both channel competition and brand competition coexist, pointing out that wholesale price subsidy contracts can coordinate the supply chain. Hua Guowei et al.^[22] think that the optimal time and price can be studied from two aspects: centralized and decentralized. Ding Zhengping et al.^[23] analyzed the pricing equilibrium of decentralized decision making under different dual-channel structures, and found that the revenue-sharing contract can fully coordinate the supply chain in decentralized decision making. In centralized decision-making, the supply chain can be realized through price difference complete coordination. When adopting free riders, consumers propose the equilibrium price under the decentralized decision-making of the three supply chains and propose the pricing strategy to maximize the overall profit of the dual-channel supply chain. Fan Xiaojun et al.^[24] studied the pricing and service competition strategies of dual-channel supply chain by analyzing consumer service preferences. Huang et al.^[25] studied the impact of cooperative advertising decisions on channel supply chain pricing decisions. Chen et al.^[26] studied the pricing decisions of dual-channel retailers based on consumer utility theory and found that, compared with other retailers, retailers will be priced high.

The existing literature has analyzed the influence and function of the double channel from different angles. By analyzing the channel pricing game and comparing the different advantages of the channel, the article provides the advice of the channel pricing decision. However, there are still many deficiencies in the existing research, such as neglecting or weakening the behavior of consumers during the purchase, and less consideration of the wholesale price.

2.4 Dual-channel supply chain coordination mechanism

Although the dual-channel model of online direct selling and traditional distribution has become a major feature of marketing in today's manufacturing enterprises, the emergence of direct selling channels will inevitably compete with traditional distribution channels, triggering a key issue in dual-channel markets: channel conflict. Therefore, the issue of coordination of channel conflicts has become a hot issue in dual-channel research.

Chu and Desai^[27] studied a channel coordination mechanism based on customer satisfaction, believing that manufacturers can promote retailers to improve customer satisfaction and achieve Pareto improvement of both parties' returns according to retailer's effort cost and effort, and utilize two pricing contracts study the coordination of the supply chain and find that the two pricing schemes can coordinate the supply chain. Raju and Zhang^[28] studied the quantity discount and two pricing contracts to coordinate the supply chain for the strong retailers in the supply chain. Kurata and Yao^[29] pointed out that under the channel price competition, the combined use of price discount and price premium compensation can coordinate the two-channel supply chain. Tsay and Agrawal^[30] think that the online direct sales channels and the traditional distribution channels are both extrinsic to sales promotion. However, the retail channel promotion has the cost advantage. The replenishment price plus the wholesale price contract can coordinate the supply chain. Qin Geng et al.^[31] studied the equilibrium of price competition and supply chain coordination under random demand and retailer promotion. Yang et al.^[32] analyzed the effect of fairness on cooperative advertising strategy and supply chain coordination in view of cooperative advertising in the case of retailers considering fairness. Yao et al.^[33] used a repo strategy to analyze the supply chain and

Seifert et al.^[34] used a compensation strategy to coordinate the two-channel supply chain. Xiao and Qi^[35] proved that the use of discount discounts can coordinate the supply chain when costs and demand simultaneously perturb. Cao et al.^[36] studied the coordination problem of VMI supply chain. The study found that using VMI alone could not effectively improve the efficiency of supply chain. Only with the revenue sharing contract can we coordinate the activities among supply chain members. Wang Hong et al.^[37] discussed the conditions for establishing direct sales channels, pricing of channels and the coordination of wholesale price contracts in the supply chain based on the dual-channel supply chain in which suppliers are risk averse. Xiong Zhongkai et al.^[38] studied supply chain coordination based on dynamic pricing in the network environment. The study found that revenue sharing can not achieve supply chain coordination, revenue sharing and rebate contracts can achieve supply chain coordination. Xie Qinghua and Huang Peiqing^[39] studied the issue of double-channel coordination based on quantity discount and found that there is an infinite number of contracts for the quantity discount of coordinated dual-channel supply chain. Liu et al.^[40] studied dual-channel supply chain decision-making in the presence of service competition and service spillover effects, and used revenue-sharing contracts to coordinate the supply chain. However, Bin et al.^[41] studied the compensation strategy for the coordination of the two-channel supply chain, and demonstrated that the compensation strategy can achieve the coordination of the two-channel supply chain and ensure a win-win situation for the members of the two-channel supply chain within a certain range.

In domestic and foreign literature, there are many coordination strategies on a single channel. However, in the dual-channel supply chain, the manufacturer is not only the retailer's supplier but also the retailer's competitor, resulting in the dual upstream and downstream in the dual-channel supply chain marginalization problems exist at the same level of channel conflicts, so the general supply chain contract will not be able to coordinate dual-channel supply chain. The pricing decision and coordination method of dual channel supply chain have attracted the attention of academic circles, and some research results have been formed. However, the research at this stage is mainly focused on the discussion under some specific assumptions, and the results are often difficult to apply to reality.

3. The future research prospect of dual-channel supply chain management

3.1 Considering increasing the diversity of objects

Most of the current research is a two-channel supply chain of a manufacturer and a retailer, less research for multiple manufacturers and retailers, and does not consider the problem of a manufacturer may have multiple traditional distribution channels for this In more complicated cases, the research of supply chain is also more complicated. For example, whether a manufacturer can coordinate with many retailers or retailers whether there are differences or differences will affect the manufacturer's decision-making, a large amount of literature has studied the consumers preferences of the channel, the difference of channel service, and the conclusion that putting these factors into the more complex supply chain can all be used as the research direction in the future.

3.2 Considering the diversity of influencing factors

Based on the previous literature review, it can be found that a large number of literature consider the factors are relatively single, consider a single product more, with fewer differences in the product, the majority of literature is more emphasis on consumer preferences to the channel, channel service differences ,these two factors to study the decision-making of dual-channel supply chain, did not consider more shadow. In the future, more influential factors will be included in the research so as to be more realistic.

3.3 Considering free ridership

The low price of network marketing channel leads to the emergence of free ride behavior. However, the research on dual channel supply chain nowadays does not pay much attention to the impact of

free ride on dual channel supply chain, especially in domestic literature and this aspect. For future research, under the assumption of free ridership, it is possible to study how manufacturers and retailers cooperate to make the supply chain be coordinated, and free riders can occur either unidirectional or bidirectional. One-way free riders typically put retailers at risk, and there is a reasonable mechanism for making both parties profitable by minimizing such behavior. Free ride behavior in line with the actual situation, the study of this issue is also of great significance.

3.4 Considering the diversity of products

In the dual-channel supply chain system where the network channel and the traditional channel coexist, product differentiation leads to more competition in the supply chain system. However, the product differentiation has a different effect on the profit of different members. In a manufacturer-dominant supply chain system, manufacturers can influence consumers' value judgments on different products through marketing strategies such as advertisement diffusion and expand the influence of private brands in the network direct sales channels. Through the implementation of product differentiation strategy, manufacturers can get higher profit levels. Retailers, through buyout procurement, achieve monopoly sales for certain products, and exclude the competition of other differentiated products in the channel, which is more conducive to their high profits.

3.5 Considering the dual-channel cooperation model innovation

Compared with a single channel, dual channels can improve the profitability of manufacturers and the overall performance of the supply chain. Therefore, the coordination of supply chain is mostly the contractual mechanism that considers the profit distribution of supply chain members. There is almost no research on how to make a big cake in a double-channel setting. Although there are conflicts between the two channels, the dual channels have different advantages and disadvantages of different channels. For example, the virtual online channels can save space, display a large number of products, and the offline physical stores can provide intuitive feelings and services. The online channels can shop anywhere, make full use of fragmentation time, offline store can quickly meet the customer's daily consumption and so on. Taking full account of the advantages and disadvantages of the dual channels and analyzing the new forms of cooperation under the dual channels, this is also an important direction that needs to be studied in the future.

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