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Supply Chain Decision-Making of Cross-Border E-Commerce Platforms

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Abstract: Consumers in China now enter the cross-border import retail e-commerce stage, however, the supply chain has always been an important factor in restricting its development. Different from the traditional retail e-commerce, the supply chain decision-making model of cross-border e-commerce platforms is unique. As an emerging field, cross-border import retail e-commerce platform supply chain aroused the interest of many scholars, the research in this area has initially achieved some results. Based on the existing researches and the background of the cross-border import retail e-commerce platform, We put forward that supply chain decision-making as object to investigate platform revenue management and competition and coordination between platform providers and online retailers by depicting the impact of the typical behavior characteristics of platform participants on e-commerce platform supply chain decision-making and its mechanism is worth to be studied.

Keywords: Platform-based retailing; Supply chain decision-making; cross-border e-commerce platform

1 SIGNIFICANCE OF CROSS-BORDER E-COMMERCE

With the rise of our country is ushering in a "new consumption" era. The emergence of new middle class has led to the escalation of consumption. They tend to buy international, high-quality goods with good credit, reliable sources and after-sale protection through credible and convenient channels [1]. Through the cross-border import retail e-commerce platform, people can buy foreign goods with just a few mouse clicks [2]. After legalizing bonded imports of online shopping by the General Administration of Customs in 2014, the State Council released the Guiding Opinions on Promoting the Healthy and Rapid Development of Cross-Border E-commerce in June 2015 which explicitly requires relevant departments to strongly support the development and optimization of

imported e-commerce Clearance process [3]. Imported retail e-commerce across borders refers to a commercial activity in which domestic e-commerce enterprises sell foreign goods to domestic consumers and conduct transaction, payment and settlement via e-commerce platform and deliver goods through cross-border logistics to complete the transaction [3]. Consumers in China now enter the cross-border import retail e-commerce stage, however, the supply chain has always been an important factor in restricting its development [4]. The project will focus on the optimal decision-making and coordination mechanism for the cross-border retail e-commerce platform supply chain. Shopping needs and behavior of consumers through cross-border e-commerce platform imports have their own uniqueness. How to set the optimal decision-

making for platform and merchants according to the consumer's choice behavior is a key issue. Different from the traditional retail e-commerce, the supply chain decision-making model of cross-border e-commerce platforms is unique, which is specified as follows.

2 SUPPLY CHAIN DECISION-MAKING MODEL OF CROSS-BORDER E-COMMERCE PLATFORMS

1) The Cross-time character of consumption complicates consumer choice behavior. On the one hand, the cross-border retail e-commerce platform enhances consumer's purchasing experience by providing premium products from all over the world. On the other hand, the factors that consumers need to consider in purchasing goods across time and space are more complicated. For example, consumers have limited access to information on overseas goods (limited channels of product promotion), resulting in certain risks of consumer's purchasing decisions. Platform or merchants are more flexible in terms of return policy options (as opposed to the choice space of traditional e-commerce) and can influence consumer's buying behavior by choosing the level of disclosure of return information. Order lead time and prices in different modes of importing (direct mail overseas or bonded Delivery) are also quite different, consumer's perception of the value of the genuine products in the two modes are inconsistent. Therefore, based on the new characteristics of consumer's behavior, how to choose the combination of service strategies such as the best import method and the degree of disclosure of information on returns and etc. to improve the traffic conversion rate of the platform (the conversion ratio of the flow rate of the consumer's access to platform into the actual purchase) [5] has become an important issue for the decision-making of cross-border e-commerce platform.

2) There is a two-way choice between platform provider and merchant. On the one hand, there is competition and interaction between merchants on the integrated platform; on the other hand, the platform can be divided into vertical experience type and comprehensive type. Generally, vertical experience-oriented platform has narrower product line, focusing on product knowledge promotion and user guidance. Product line of comprehensive type is wider, focusing on price competitiveness and full category coverage [6]. In addition, the operating mode of the platform is also quite different, which generally is divided into agent type, and mixed operation type. Among them, the merchant on agent-type platform generally need to pay a certain

fee to the platform provider. Merchant need to choose the type of platform and the timing to settle on the platform, the platform has the right to determine to the types of merchants. The bidirectional choice between the platform provider and the merchant is a game process, and the outcome of the game will ultimately determine the channel structure of the supply chain. Therefore, how platform providers and merchants make the best decisions and the corresponding supply chain coordination mechanisms is a question worth being explored further.

3) The platform has the function of dynamic regulation of the merchant. The function of platform dynamic regulation is that the platform dynamically guides the business to make its behavior reach the expected goal: on the one hand, how to design positive incentive measures to motivate them to enter the channel when they have complementary effect on the platform (such as mitigating the risk of out-of-stock); on the other hand, when a merchant speculates in cooperation with a platform provider, how to design a punitive mechanism to regulate its behavior. Therefore, how to coordinate the supply chain and to ensure the sustainable development of the supply chain through the powerful regulation and control of the platform is a problem to be further investigated.

3 CROSS-BORDER IMPORT RETAIL E-COMMERCE PLATFORM SUPPLY CHAIN RELATED RESEARCH

As an emerging field, cross-border import retail e-commerce platform supply chain aroused the interest of many scholars, the research in this area has initially achieved some results.

Some scholars studied the key factors affecting the performance of cross-border retail e-commerce supply chain. Gao Xiang and Jia Liangting proved that the key risks affecting the cross-border online retail supply chain of enterprises include online marketing risk, cross-border online payment risk, network clearance risk, cross-border logistics risk and credit risk through empirical research on the retail data of 167 enterprises operating in cross-border networks in Shanghai, Guangzhou and other cities [7]. Kim et al. (2004) analyzed about 40,000 pieces of the transaction data from cross-border retailers and found that the courier service resulted in higher order incidence, larger order size and higher cross-border transaction [8]. Ding Feng and Huo Jiazhen pointed out that when choosing a logistics service provider, cross-border online retailers should separate the business into international segment and domestic segment and help logistics providers improve service level [9].

Wang Yun took a self-operated mother-baby import e-commerce platform as the research object and re-adjusted the import mode of all the products of the platform (overseas direct mail and bonded stocking mode) according to the sales volume of the products. From the aspects of service quality, cost and competitive advantage, Wang Yun analyzed the expected effect and impact of cross-border e-commerce after the import mode was adjusted [10].

Some scholars tried to discuss the optimal decision-making of cross-border retail e-commerce platform supply chain. Based on the characteristics of the overseas warehouse purchase mode, Zi Daogen took the stock control in the mode of cross-border import e-commerce platform overseas warehouse as the research object and investigated optimal purchase quantity, safe stock and ordering point when decision-making demand and lead time are in the condition of random discreteness[11]. Lian Liyang and Cheng Quan adopted the evolutionary game method to prove that both parties can reach an evolutionary stabilization strategy only when the mutual trust between cross-border e-commerce parties is high [12]. Hong Guobin and Lin Zhenxing established cross-border import pricing model based on the factors of cross-border trade and related factors. The conclusion showed that the delayed sales strategy of the third-party platform is the best choice when the demand diffusion intensity is high [13].

4 SUMMARY OF EXISTING LITERATURE RESEARCH AND ANALYSIS

The research on supply chain decision-making of cross-border retail e-commerce platform is just emerging and preliminary progress has been made. However, the existing researches only dealt with some features of e-commerce platform and have not yet formed a scientific system. In combination with the new features that consumers are presenting in terms of needs and behaviors through cross-border import retail e-commerce for shopping, there are still many scientific issues to be further studied.

1) Multi-dimensional heterogeneity of consumer demand and choice behavior: The literature on traditional online retailer's revenue management and decision-making mainly considered the impact of logistics factors (such as returns, shipping costs and inventory information disclosure) on consumer behavior. The literature on online platform retail decision-making mainly considered the influence of bilateral user price structure on platform revenue. However, the cross-time and cross-space nature of consumer's purchase of goods through cross-border import e-commerce platforms exists.

Purchasing decisions are subject to cross-border e-commerce imports mode (overseas direct mail / bonded stocking), cross-border logistics distribution capabilities (affecting overseas direct mail lead time), return policy commitments and information disclosure (more operational than traditional e-commerce), personal risk preferences, cross-border shopping experience and other factors. The research on traditional online retail revenue management does not apply to the situation of China's cross-border retail e-commerce platform. Therefore, how to design the service and pricing strategies of platform and merchant based on consumer behavior is an issue that should be further studied.

2) Bidirectional two-way choice between platform and merchant: Game theory was mainly used to study multi-channel competition and coordination involving traditional online retailers to investigate channel structure design where manufacturers or retailers have the channel domination. Multi-platform competition and coordination research focused on platform commission decision-making and competition behavior based on differences in platform capabilities. However, for the integrated platform, merchants are diversified, merchants of these types may sell the same product at the same time. There is competition and interaction between merchants such as the richness of business types, positive impact on demand. Overseas buyers who know more about the product are more personalized to promote the product (such as live broadcast) products, they also lead to the needs of other types of merchants. There is a two-way choice between platform and merchant. According to the situation of diversified merchants, how the two parties will determine the optimal strategy on channel selection remains to be further explored.

3) Platform business model differentiation: The existing literatures did not take heterogeneity on business models of cross-border import retail e-commerce platform into account. There are not only competition between platforms but also cross-impact and spillover effects, e.g. knowledge-based promotion of vertical experience platform will promote product sales on the integrated platform. The choice of platform in the business channel also affects consumer demand (self-operated/agency/mixed business). Therefore, how to design optimal decision-making for platform and merchant based on competitive heterogeneous platforms is an issue to be further explored.

4) Dynamic regulation of the platform: The existing researches on the e-commerce platform supply chain focusing on transaction behavior between the platform provider and the merchant

(the platform commission rate structure design, the mutual speculative decision-making between the platform provider and the merchant, etc.) did not combine the characteristics of cross-border import retail e-commerce platform to explore platform provider's control on channel structure and avoidance on speculation. How to design the positive incentive (or negative penalty) mechanism of the platform to realize the coordination of the platform retail supply chain remains to be further discussed when the merchants who enters the platform are complementary for channels based on the out-of-stock risk (or the presence of speculation in the merchants).

Based on the existing researches and the background of the cross-border import retail e-commerce platform, The issue of supply chain decision-making as object to investigate platform revenue management and competition and coordination between platform providers and online retailers by depicting the impact of the typical behavior characteristics of platform participants on e-commerce platform supply chain decision-making and its mechanism is worth to be studied, in order to fill the gap (to some extent) of relevant theoretical research and practical application.

5 INNOVATION

(1) The cross-border imported e-commerce platform makes consumption break the time and space constraints. Capture this opportunity for consumption, the gradual emergence of cross-border import e-commerce platforms and has initially formed a scale, traditional retail e-commerce platforms have also opened up the global procurement channels to join the market for competition. In the research of online retail supply chain, although there are many research results, there are few studies on the decision-making and coordination of cross-border imported retail e-commerce platform supply chain. This study will draw on the research methods of traditional online retail supply chain decision-making and coordination, take into account the impact of the typical characteristics of platform participants on platform providers and merchants, and establish new models to guide the decision-making and coordination of supply chains by platforms and merchants. This study has a certain amount of academic research value, and it also exactly fits the needs of cross-border imported e-commerce supply chain real-world problems.

(2) How to solve the problem of out-of-stock and circumvent speculative behaviors of platforms and merchants that operate in explosives cooperation is

a common problem that needs to be solved urgently for cross-border imported e-commerce platforms. Existing online retail supply chain related fields mainly study the information disclosure problem of stocks and the speculation of businesses, but seldom involve the study of such issues. This topic will make up for this shortcoming, considering the dynamic cooperation and cooperation between platform providers and merchants, and the dynamic control function based on the platform. With reference to the typical contract theory of supply chain, the relevant punishment, incentive, and benefit distribution mechanisms will be set. Guide businesses to achieve sustainable development of the platform together.

(3) Pre-research: Based on the existing literature preparation, further document tracking and analysis to understand the latest domestic and foreign developments related to this project, focusing on the related research areas of online retail supply chain decision-making and coordination, platform participant behavior, etc. At the same time, through questionnaires and other empirical methods, we understand consumer preference characteristics of platform service types and attributes, as well as the main issues faced by platform providers and merchants in meeting consumer demand based on existing service levels. Based on this, the research content of this topic is further concise, and through relevant enterprise interviews and project team member discussions, the research objectives are finalized and a specific research plan is designed.

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