Four Express Service Cooperation Modes for B2C E-Commerce: Models and Analysis

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ABSTRACT
The express service quality becomes a dominant factor along with the price of product affecting consumer’s purchasing decision. This paper investigates how the express service quality affects the demand of online purchasing, and how to improve the express service quality and supply chain’s performance through cooperation. The authors consider an online supply chain and utilize a nonlinear demand model by incorporating the express service quality as a decision variable and propose four express service cooperation modes, i.e. (1) the retailer offering subsidy to the express provider; (2) the integration between the retailer and the express provider, (3) the manufacturer offering subsidy to the express provider and (4) the integration between the manufacturer and the express provider. In each cooperation mode, they derive the equilibrium priceings, service levels, demands and profits. By comparison, the authors explore which one is appropriate for chain members to implement.

Keywords: B2C E-Commerce, Express Service Quality, Game Theory, Supply Chain Cooperation

INTRODUCTION
With the rapidly development of E-commerce, online shopping has become an emerging trend during recent years and presents its own feature. In 2013, the growth rate of online retail sales in China is commonly about twenty percentage points higher than that of the physical stores (AliResearch, 2013). According to the prediction of eMarketer, a market research firm in America,
the retail sales of online consumer goods in the whole world will reach approximate $1.5 trillion in 2014. In addition, it will be the first time for the amount of online consumers in Asian-Pacific region to exceed that of online consumers in North American region (AliResearch, 2014). Inevitably, since the development of online shopping is so quick, some new characteristics and problem have been found. Comparing with the traditional physical store shopping, one dominate feature of online shopping is offering home delivery service, which can release the consumers from having no choice but to personally visit physical stores, at the same time, stimulates the rapid growth of express industry. Furthermore, only through the express service, can the online shopping consumers have access to the commodity which they have purchased. However, the express services are on various levels and most of which are relatively low. Thus it is inevitable for online consumers to measure both the express services level and the price of the product before making his purchasing decision. Either of them is not appropriate, consumers would like to abandon shopping online.

From this point of view, express service, as well as product price, has critical impact on demand. Previous literatures also confirmed the importance of express service in many aspects. Boyer and Hult (2005) indicate that both the product and service-quality have a significant direct effect on customer behavioral intentions to purchase again. In addition, since the price differences are often with little fluctuations, consumers’ online shopping behavior may be fundamentally determined on the express service quality, especially on the product delivery time (Hsiao, 2009). Besides, safety, high efficiency and zero breakage rate of commodities are also required by consumers. However, the improvement of the service levels is an obvious bottleneck for most of express delivery industries. Particularly, during some festival and sales promotion, this problem grows even more serious. For example, during the Spring Festival, most online consumers have experienced some dissatisfying services, such as lengthy delays, package in damaged condition. All these dissatisfactions will eventually affect the consumers future purchasing.

After recognizing such a problem, except for the express company, both the manufacturer and the online retailer pay attention to the express service quality. High express service quality will stimulate high demand. Thus they are inclined to help improve the express service level. In practice, there are two common methods. One is to provide subsidy. This method is taken for its easy implementing. Furthermore, since the business competition is evolving from one agent to the whole supply chain, modern enterprises think more about the whole supply chain’s performance than before. The other is the integration among supply chain members. It is adopted by some industries, especially by some ones who place emphasis on vertical integration. Based on the above two methods, there are four different cooperation modes around the express provider, i.e. (1) the retailer offers subsidy to the express provider. (2) the retailer and the express provider are integrated into one system. (3) the manufacturer offers subsidy to the express provider and (4) the manufacturer and the express provider are integrated into one system. Note that those four cooperation modes will generate various results for retailer and manufacturer. Thus we focus our study on analyzing which mode is suitable for retailer and manufacturer. In detail, our research questions include the following: (i) what are the optimal decisions of the channel members in the decentralized case when there is neither the subsidy policy nor the integration? (ii) from the perspective of the retailer, which way is feasible for him to carry out? and (iii) as to the manufacturer, which way would he choose?

In order to answer the above questions, this paper considers an online supply chain consisting of a manufacturer, an online retailer and an express provider. In the current B2C environment, we suppose the express service quality has a direct influence on the online sales as well as the price. Under this setting, we utilize a Stackelberg Game and derive the optimal equilibrium decisions of channel members in four different cooperation modes which are all around the
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