The Role of Postponement Strategies to Reduce Supply Chain Risk

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Abstract

Numerous scholars have noted that the postponement strategies can effectively reduce the supply chain risk. First of all, the paper investigates the role of postponement strategies in the control of supply chain risk. According to the order of supply chain, typical postponement strategies include purchasing postponement strategy, logistics postponement strategy, production postponement strategy, product development postponement strategy, and pricing postponement strategy. The paper then discusses the meaning of each delay strategy and how to reduce the supply chain risk. Each postponement strategy is closely related to the corresponding supply chain risk. Finally, conclusions are drawn and some remarks about further research are made.

Keywords: Postponement strategy; Supply chain risk; Management

1. INTRODUCTION

Currently, the competition between individual enterprises has been turned into the competition between supply chains. The success of the supply chains depends on the control of supply chain risk. The uncertainty in the structure of the network between enterprises and the external environment makes the supply chain more vulnerable. Anyone accident in the supply chain is likely to lead to the interruption of entire supply chains, and cause serious losses. Therefore, research on supply chain risk management has been paid more and more attention.

The competitive environment is forcing enterprises to adopt new strategies to cope with the ever changing market conditions. Postponement strategies have been considered as important methods to contribute to the attainment of both mass customization and agility (Feitzinger and Lee, 1997). Using postponement a firm could perform the non-postponed activities speculatively and use reactive capacity only to customize the final product thereby enhancing the profitability of accurate response (Reimann Marc, 2012).Postponement can be understood as a way to change the form, identity, or location of products at the latest possible point in time and can be applied at different levels in the supply chain (Ferreira, KA et al. 2014).

2. THE CONCEPT AND CONNOTATION OF THE POSTPONEMENT

The concept of the postponement was first proposed by Alderson (1950) from a marketing management perspective. Only in recent years has the amount of research addressing postponement significantly increased. Mass customization and agility are often cited to be such strategies. Bucklin (1965) was concerned with where the channel inventory should be positioned (up-stream waiting for customer orders, or down-stream in anticipation of future customer orders) and which player (supplier or customer) should carry the inventory.

Postponement means to delay activities in the supply chain until customer orders are received with the intention of customizing products, as opposed to performing those activities in anticipation of future orders (Van Hoek 2001). Postponement is defined as the delaying of value adding activities until demand pattern becomes visible (Boone et al., 2007; Yeung et al., 2007).The logic behind postponement is that the delay leads to the availability of more information and thus the risk and uncertainty of those activities can be reduced or even eliminated (Yang B. et al., 2004). The concept of postponement is developed to include purchasing postponement, logistics postponement, production postponement, product development postponement, and pricing postponement. Although much has been written about the postponement strategy, there is still limited literature on its implications on the supply chain risk. Choi Kanghwa et al. (2012) study postponement strategy via a system dynamics simulation model, taking the experiences of a Korean automobile as an example.

3. THE ROLE OF THE POSTPONEMENT STRATEGY

Supply Chain Risk is potential threat to supply chain. Charles Perrow (1999) believes that the accident is normal, inevitably, in a closely coupled, complex system. Nowadays, the entire supply chain is a complicated system. In the supply chain system with secure connectivity conditions, enterprises generally use the means of reducing the system complexity in the supply chain risk management. The postponement

strategy is a powerful weapon to reduce the complexity.

The postponement strategy is to decrease the complexity through the following mechanism.

3.1 Delaying the Customization Production

The postponement strategy means that in the upstream of the supply chain of CODP (Customer Order Postponement Decoupling Point) is standardized, general production. But in the downstream of the supply chain of CODP is customized production. By making the product customization stage try to delay, postponement strategy can effectively reduce the complexity.

Feitzinger and Lee (1997) illustrated HP as an example to explain the key point of mass customization, which delays the differential operation to the latest point in the supply chain. Meanwhile, enterprises must integrate the processes of product design, manufacturing, distribution into the entire supply chain. In order to consider the conception of network design, they brought up three types of design theory for postponement, including product modularization, process modularization, and network design.

3.2 Combining with the General Design of Components

Lee (1994) believes that the general components are the premise of successful implementation of postponement manufacturing. The general components can affect the various departments of enterprises. Enterprises need to design a universal, standardized, modular product and process to ease the supply risk, so that it can try to delay the time of differential activity. In the modular product design, components are exchangeable, loosely coupled, scalable, and it will greatly reduce the dependence between the components. The use of general components allows manufacturers to transfer the procurement source when the supply disruption.

From the point of view of product development department, general components lead to reduce development time, cost, risk; from the perspective of production department, it is convenient for production planning and control, and lead to economies of scale, and reduce procurement and production complexity.

3.3 Using Information Exchange Mechanism to Reduce the System Complexity

The postponement strategy reflects the customer driven mechanism. Based on accurate understanding of customer information, enterprises can produce and deliver products. The use of accurate information on the upstream and downstream in the supply chain can effectively alleviate the complexity within the system.

The proven success of Dell suggests that to a certain extent, PC customers seem to have a good appreciation of the customization feature (Hartanto Wong and Daniel Eyers, 2011). Dell allows customers to configure their computers on the Internet. In getting the customer's order information, Dell quickly assembled based on general components, according to customer requirements, and then share these demand information to the suppliers through the network. The exchange of information provides the powerful guarantee for Dell in terms of accurate understanding of customer needs and instant purchase element, and reduces the risk of excessive production and excessive procurement.

4. PONOSTPONEMENT STRATEGIES ANALYSIS BASED ON THE TYPE OF SUPPLY CHAIN RISK

A large number of research papers discuss the postponement strategy in supply chain management. Shao XF and Ji JH (2008) analyzed and compared two different postponement strategies applied in a mass customization system with service time guarantees. Saghiri Soroosh (2011) put forward a structural approach to assessing postponement strategies: construct development and validation. Schwartz Frank and Voss Stefan (2014) studied the postponement strategies in supply chain management. Ni Yanting and Wang Yi (2015) put forward a double decoupling postponement approach for integrated mixed flow production systems. Zhou Wenhui et al. (2015) developed a two-stage queueing network on form postponement supply chain with correlated demands.

Supply chain risk is divided into supply risk, production risk and demand risk in this paper from the perspective of the manufacturer. This paper will discuss the postponement strategies to reduce each kind of supply chain risk. Fig. (1). shows the relationship between supply chain risk and postponement strategies.

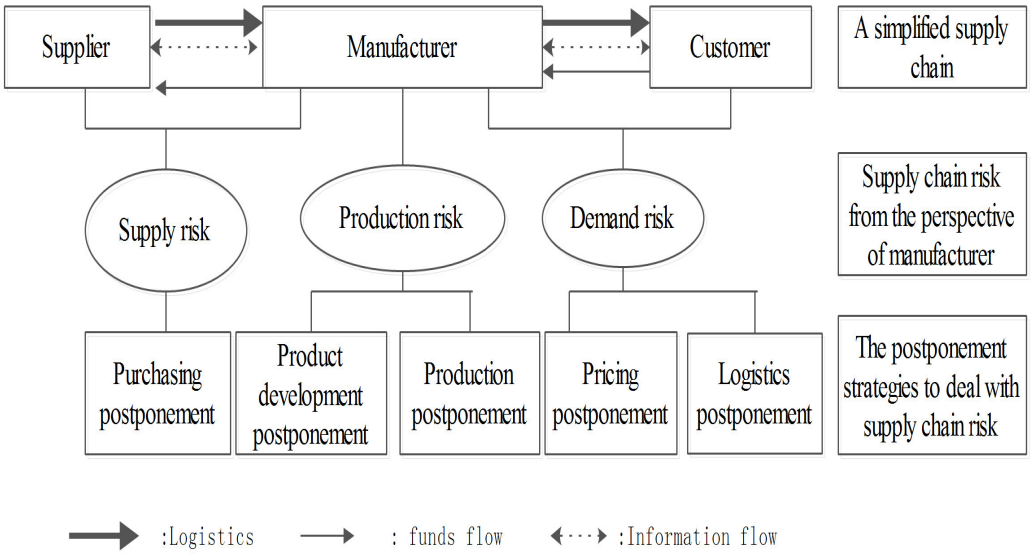

Fig. (1). The Relationship Between Supply Chain Risk And Postponement Strategies

The essence of the postponement strategy is to postpone the CODP until it receives a certain order or more accurate information, so that it can increase the proportion of the "common" part of the production. Therefore, for enterprises, the postponement strategy is an important strategy for the implementation of mass customization strategy, and the positioning of the CODP point is the core of the postponement strategy. According to the different positions of CODP, the postponement strategy can be divided into purchasing postponement, logistics postponement, production postponement, product development postponement and pricing postponement.

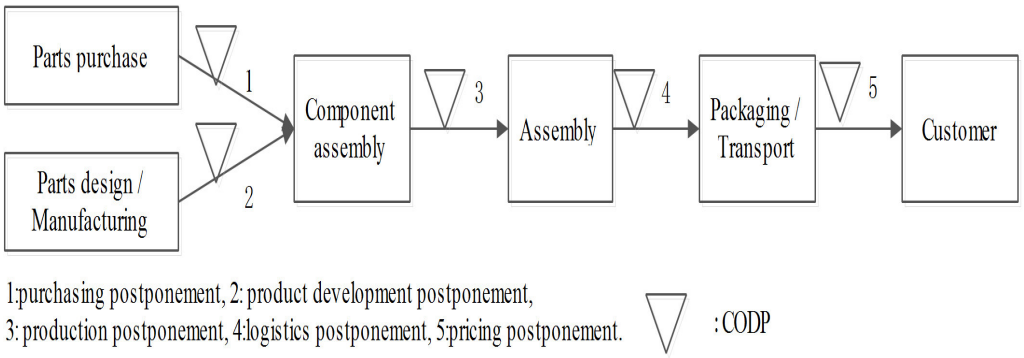

Fig.(2). The position of varied types of postpone strategies and CODP in supply chain

4.1 Purchasing Postponement Strategy to Reduce Supply Risk

Supply risk is the probability of purchasing and supplies related accidents in the supply market. Typical postponement strategy to reduce supply risk is purchasing postponement strategy.

In the case of purchasing postponement, the purchasing of raw materials is postponed until the information on downstream demand becomes available. Purchasing postponement strategy is preferred when the demand is highly uncertain, raw material has high obsolescence cost and is of high value in terms of total product cost or ties up huge amount of working capital.

Purchasing postponement especially holds true under the situation where companies can separate demands patterns into “base” and “surge” elements (Gattorna and Walters, 1996). Basic demands can be produced in advance based on long-term forecasts while decisions on product quantities for surge demands (with a higher level of uncertainty) have to be delayed until further information on market demand is available.

4.2 Postponement Strategies to Reduce Production Risk

4.2.1 Product Development Postponement

Product development postponement refers to all the activities of the value chain, including product design activities, are delayed until receiving customer orders. Product development postponement is considered extreme form of customization. Moreover in this case, the customers are also involved during the design stage.

In product development postponement, information drives all the development process. This leads to a significant reduction in lead times with fewer costly redesigns, especially those resulting from major changes later in the development processes. Toyota deals with the high levels of uncertainty by letting their suppliers come up with novel ideas and designs without limiting them with strict specification constraints. During that time, people at Toyota continue gathering market data on consumer demands and technological trends, till some convergence is achieved (Yang. B. et al., 2004). Gualandris Jury and Kalchschmidt Matteo (2015) studied the role of manufacturing postponement enablers.

4.2.2 Production Postponement

Production risk refers to the risk occurring in the production process, such as machine failure, product quality problems, the strike and so on. Production postponement means delay production activities, and makes the inventory to maintain universal state, until the receipt of customer orders. Production delays can be divided into manufacturing postponement, assembling postponement, packaging postponement, labeling postponement etc.

Production postponement strategy works where there are multiple product derivatives. High product variation makes it difficult to forecast and hold inventory at the finished stage. Production postponement results in higher production costs because of the loss of scale economies. The inventory costs on the other hand are reduced. Pagh and Cooper (1998) cites HP's example to exemplify assembly postponement strategy. HP postpones the final assembling step to the last stage at the local distribution centers and once demand becomes visible, final manufacturing/assembly activities such as power supply, packaging and labeling are carried out.

4.3 Postponement Strategies to Reduce Demand Risk

Demand risk refers to the risk of uncertainty from the market trend and customer preference. Typical strategies to decrease demand risk include logistics postponement and pricing postponement.

4.3.1 Logistics Postponement

Logistics postponement refers to the postponement of the flow of final product. Logistics postponement is like just-in-time delivery reducing obsolete inventories and improving customer responsiveness by avoiding the wrong time and place utility of products. Instead of placing the goods at the final point in the supply chain, they are kept at a central location, with the aim of following the demand pattern for the final shipments (Yang et al., 2004).

In the case of logistics postponement strategy, distribution costs are higher due to smaller shipments and faster modes, inventory costs are reduced by holding inventories at a central location while the production scale economies are preserved.

Seth Dinesh and Panigrahi Arpit (2015) studied the application and evaluation of packaging postponement strategy.

4.3.2 Pricing Postponement

Pricing postponement refers to the postponement of the final price of the product. The final price depends on the final customer need.

Pricing postponement is used by GreatModels.com, which is an online retail store which provides buyers with scale models (e.g., scale helicopter models, scale car models), accessories, and decals, etc. Indeed, it is clearly stated on their website that "the price might not show if the item is a future release," which suggests that the price of such products would be determined after demand information from the pre-launch orders has been assessed (D Granot and S Yin, 2008).

5. CONCLUSION

On the basis of the research literature, the paper investigates the role of postponement strategies. We can understand that the postponement strategies can effectively control the supply chain risk.

The research literature on postponement has highlighted potential research directions. Lack of industry specific analysis has been stressed by many researchers. Moreover the areas that have been explored are in need of empirical tools. There is a further requirement to develop industry specific measures assessing the implementation of postponement strategy which would require further exploratory studies before moving on to empirical testing. The role of organizational culture and structure in the implementation of postponement strategy has to be explored further. In addition, the impact of supply chain supply chain structure and relationships of adopting different postponement types needs to be explored further.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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