Chapter 9

Electronic Broker Impacts on the Value of Postponement in a Global Supply Chain

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Global and electronic markets are increasingly forcing manufacturing enterprises to become more competitive. As a result, many manufacturing enterprises are seeking to manage their supply chains more effectively. Product differentiation timing is one important factor in supply chain management. Under an early product differentiation process, finished products are manufactured and stored in a distribution center until delivery. Under a delayed product differentiation process, partially completed product components are manufactured and stored in a distribution center; later, based on demand information, finished products are completed from the product components. The difference in value between early product differentiation and delayed product differentiation is the value of postponement. Prior research has analytically shown that the value of postponement is affected by information precision in demand forecasts. In this article, we investigate whether adding a market-making electronic broker to a supply chain increases the value of postponement. We hypothesize that it may do so by providing greater accuracy in demand forecasting. We test this relationship by comparing the results of agent-based simulations that vary between early and late differentiation strategies and the use of an
electronic broker. In each simulation, the effects of demand correlation, demand variability, and demand pooling are considered. The simulations show that an electronic broker increases inventory cost savings (compared to a non-broker) and increases the value of postponement in the face of increasing demand variability, increasing demand pooling, and decreasing demand correlation. Moreover, an electronic broker may, through its own actions, increase demand variability and demand pooling, while decreasing demand correlation, thereby creating the environment in which it is best operates.

INTRODUCTION

As global sourcing increases (Kotabe, Murray & Javalgi, 1998), decisions about supply chain design become more complex. For multi-national corporations with international product lines and supply chains, the careful designation of vendors, services and components, timing and transportation has continually broadened to include an ever-enlarging landscape of contingencies and alternatives. Further magnifying the scope of this task is the rapid deployment of Information Technology, which has lowered transaction costs (Williamson, 1975) and raised flexibility in global sourcing opportunities. Thus, increases in global sourcing requires that the stream of research involving issues of supply chain management must necessarily continue to grow.

The use of information technology is an important research issue for global supply chain management. A supply chain involves a sequence of organizations, each fulfilling some function, as part of an overarching process of providing value to the customer. Increasingly, customers are pressuring suppliers to reduce costs and increase quality. Such pressures are being felt by each organization within a supply chain. At the same time, reduced transaction costs have enabled the formation of global supply chains. Yet, coordination is more problematic in a global supply chain. To support the interactions among globally distributed organizations, information strategies and information technologies have become critical issues.

To date, supply chain management has already received some considerable attention. Beginning with early research on channel structure (Bucklin, 1965; Dixon & Wilkinson, 1986) and coordination (Gaski, 1984; McGuire & Staelin, 1986), the scope of supply chain considerations has broadened to include, for example, communication strategies in supply chains (Mohr & Nevin, 1990), multi-market coordination issues (Anand & Mendelson, 1997), as well as material management concerns (Lee & Billington, 1992). Global supply chain management considerations now reach across the personal computer industry, clothing, and the
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