Dissertation Proposal

Competition and Cooperation in Global Supply Chain Networks

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Coping with the complexity of today's business environment, companies become more and more connected with each other. This change in business environment forces companies to consider supply chain networks in decision making. Based on cooperative game theory, non-cooperative game theory and theory of social and economic networks, my thesis studies strategic interactions among companies, including both competition and cooperation, in global supply chain networks.

The first chapter of my thesis analyzes competition between a brand-name company and its counterfeiters. The objective is to investigate the effectiveness of various anti-counterfeiting strategies. The analysis reveals that, in order to combat counterfeits, industries and governments should understand the types of counterfeiters (deceptive or non-deceptive); otherwise, anti-counterfeit strategies can be ineffective or even make counterfeits flourish in the market.

The second chapter investigates cooperation among companies in transshipping their residual inventories. This chapter employs social and economic networks to model the relationships among companies. This approach offers a richer representation of the relationships taking the coalitions used in the prior literature as special cases. It turns out that a network structure plays an important role in determining the incentives of companies to cooperate in a decentralized distribution system.

The third chapter considers the joint efforts of competing manufacturers to monitor product safety of their suppliers. For example, manufacturers may audit their common suppliers jointly or share independent audit results with others. The analysis shows that the incentives to cooperate and the effectiveness of auditing depend crucially on the externality of product safety of one manufacturer on other manufacturers. In order to design an effective and stable cooperative audit program, one should assess the level of externality in specific market settings.