

Retailer Inventory Sharing in Two-Tier Supply Chains: An Experimental Investigation

Andrew M. Davis, Rihuan Huang (Cornell SC Johnson College of Business, Cornell University) and

Douglas J. Thomas (Darden School of Business, University of Virginia)

Abstract

When multiple retailers hold inventory to satisfy random demand, retailer inventory-sharing strategies can potentially reduce the supply-demand mismatch and increase overall supply chain performance. In this paper, we experimentally investigate alternative inventory-sharing strategies in a two-tier supply chain with an upstream manufacturer and two downstream retailers. In one setting, retailers act as if they are centralized and use a single quantity to fulfill joint demand. In the other, retailers are decentralized and face separate demands, but can transfer inventory after demands are realized. In this latter decentralized scenario, we also consider whether the manufacturer or retailers have decision authority over the inventory transfer price. One key result is that when the retailers are decentralized and the manufacturer sets the transfer price, both retailers and the manufacturer earn higher profits than in the centralized retailer strategy, which runs counter to theory. We also find that when retailers are decentralized and set their own transfer price, the most equitable distribution of profits is achieved. In an effort to account for these results we find that a model of fairness captures decisions well. Overall, by investigating how different inventory-sharing strategies affect the distribution of profits in a two-tier supply chain, our results provide guidance to firms considering how, if at all, they should enter such arrangements.