Do Electronic Markets Reduce the Bullwhip Effect?
An Empirical Analysis of the U.S. Manufacturing Supply Chains

Abstract

The bullwhip effect is a major source of supply chain inefficiency. While prior literature has identified a number of potential contributing factors and recommended such remedies as information sharing enabled by information technology (IT) or electronic markets, few studies have provided empirical support. We use industry-level data to examine whether the use of electronic markets (or electronic linkage, EL) with buyer industries and supplier industries help reduce the inventory-demand variance ratio (a proxy for bullwhip effect). Our major findings are: (1) EL use with supplier industries reduces the inventory-demand variance ratio, while (2) EL use with buyer industries increases it, but (3) this adverse effect tends to be mitigated by the strength of information systems. These findings point to the possible asymmetric effects of EL use in supply chains, and provide a different perspective to the existing conclusions in the literature that EL use improves performance. Combining the above results, we have learned that the use of EL tends to behave differently, depending on whether it is used upstream or downstream in the supply chain. This also sheds light on the conditions under which such investment may be more (or less) beneficial.

Key Words:
Supply Chains; Bullwhip Effect; Information Technology; Electronic Markets; Manufacturing; Empirical Analysis