On Replenishment Rules, Forecasting, and the Bullwhip Effect in Supply Chains
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On Replenishment Rules, Forecasting, and the Bullwhip Effect in Supply Chains

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Abstract

In this review we focus on supply coordination and use the bullwhip effect as the key example of supply chain inefficiency. We emphasize the managerial relevance of the bullwhip effect and the methodological issues so that both managers and researchers can benefit.
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Modern Supply Chains

Supply chains are networks of firms who pool their capabilities and resources in order to deliver value to the end consumer. Firms are no longer able to own or control complete supply chains. Information technology and modern logistics capabilities have created a global market where companies can take advantage of the opportunity to source internationally. Companies have thus specialized and “partnered” globally with other companies. These companies have then to increasingly focus on logistics and supply chain coordination. Such coordination is now an essential business process.

Modern supply chain management starts with the premise that supply chain members are primarily concerned with optimizing their own objectives and this self-serving focus often results in poor performance. Another way of saying this is that a sequence of local optimum policies does not bring about a globally optimum solution. Munson et al. summarize it as follows “When each member of a group tries to maximize his or her own benefit without regard to the impact on other members of the group, the overall effectiveness may suffer. Such inefficiencies often creep in when rational members of supply chains optimize individually instead of coordinating their efforts.”
Modern Supply Chains

A well known example of such inefficiency is the bullwhip effect. This effect refers to the tendency of replenishment orders to increase in variability as one moves up the supply chain from retailer to manufacturer. A disintegrated material flow, combined with distorted demand information and a lack of replenishment rule alignment inevitably results in poor supply chain dynamics. This lack of coordination may even outweigh the benefits from specialization and economies of scale.

In this review we focus on supply coordination and use the bullwhip effect as the key example of supply chain inefficiency. We emphasize the managerial relevance of the bullwhip effect and the methodological issues so that both managers and researchers can benefit.
References


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