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# Reduction of the value of information sharing as demand becomes strongly auto-correlated

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## Abstract

Information sharing has been identified, in the academic literature, as one of the most important levers to mitigate the bullwhip effect in supply chains. A highly-cited article on the bullwhip effect has claimed that the percentage inventory reduction resulting from information sharing in a two level supply chain, when the downstream demand is autoregressive of order one, is an increasing function of the autoregressive parameter of the demand. In this paper we show that this is true only for a certain range of the autoregressive parameter and there is a maximum value beyond which the bullwhip ratio at the upstream stage is reduced and the percentage inventory reduction resulting from information sharing decreases towards zero. We also show that this maximum value of the autoregressive parameter can be as high as 0.7 which represents a common value that may be encountered in many practical contexts. This means that large benefits of information sharing cannot be assumed for those Stock Keeping Units (SKUs) with highly positively auto-correlated demand. Instead, equally careful analysis is needed for these items as for those SKUs with less strongly auto-correlated demand.

**Keywords.** Supply chain, bullwhip effect, information sharing, autoregressive demand

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