Impact of demand changes and supply chain’s level constraints on bullwhip effect

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A B S T R A C T

During an aggravated economic situation many companies have to deal with various situations that present demand distortion and changes in production processes. As a result orders to suppliers fluctuate upstream of the supply chain in amplified form. This phenomenon is called the bullwhip effect, which is one of the more interesting and developing problems within supply chain management. This undesirable effect produces excess regarding inventory, problems during production planning and poor customer services. In this paper we experimented with two special cases in a simple four stage supply chain with the level constraints represented by the overall equipment effectiveness (OEE) level: Case 1 – stable demand with single 5% change and ideal OEE level, and Case 2 – stable demand with single 5% change and OEE level changes upstream of the supply chain. The results of spreadsheet simulation are shown in the tables and charts. The impact of slight demand distortion and level constraints within the supply chain on the bullwhip effect was evident. The comparison of the results showed that when deviations in production processes are present the higher bullwhip effect occur at different stages within the supply chain and depending on the situation do not have to occur at stages within the supply chain with the lowest OEE levels.

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References


