

Supply Chain Analysis: Ordering with Exponential Lead Times

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Abstract

Order crossover occurs when orders are not received in the same sequence in which they are placed. Order crossover reduces the variance of the parent lead time and, consequently, the cost of an inventory system. We show that, in periodic ordering, the reduction in the variance depends on the planning horizon, n , and that when $n \rightarrow \infty$, the variance of the *effective lead time (ELT)* is in the neighbourhood of $\lambda / 2$, λ being the mean of the parent exponential lead time. So, when the cost of placing orders is minimal as in e-commerce, frequent ordering may lead to inventory savings along a supply chain.