

Supply Chain Networks Reliability by Considering Dependencies Between Elements of the Chain

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Abstract

Reliability of supply chain networks has received considerable attention in the literature but in the most of the past works the dependency relations between network elements are disregarded while this issue may have important effects in the results. In this paper we suggest the use of reliability theory as a performance index for supply chain network, and take into accounts the dependency relations between the elements of the chain. Suppliers and distributors in the supply chain are usually dependent and their dependency relations may be linear or nonlinear. We use a copula-based method for analyzing the reliability of supply chain network. By assuming the k-out-of-n: G structure for the supplier and k'-out-of-n': G structure for distributors, an evaluation method is proposed and the reliability indexes are obtained. Finally, to illustrate the results obtained in this paper, we present a numerical example.