

## Supplier Selection in a Scenario Based Stochastic Model with Uncertain Defectiveness and Delivery Lateness Rates

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**Abstract :** Due to today's globalization as well as outsourcing practices of the companies, the Supply Chain (SC) performances have become more dependent on the efficient movement of material among places that are geographically dispersed, where there is more chance for disruptions. One such disruption is the quality and delivery uncertainties of outsourcing. These uncertainties could lead the products to be unsafe and, as is the case in a number of recent examples, companies may have to end up in recalling their products. As a result of these problems, there is a need to develop a methodology for selecting suppliers globally in view of risks associated with low quality and late delivery. Accordingly, we developed a two-stage stochastic model that captures the risks associated with uncertainty in quality and delivery as well as a solution procedure for the model. The stochastic model developed simultaneously optimizes supplier selection and purchase quantities under price discounts over a time horizon. In particular, our target is the study of global organizations with multiple sites and multiple overseas suppliers, where the pricing is offered in suppliers' local currencies. Our proposed methodology is applied to a case study for a US automotive company having two assembly plants and four potential global suppliers to illustrate how the proposed model works in practice.

**Keywords :** global supply chains, quality, stochastic programming, supplier selection

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