World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:15, No:07, 2021

A Mathematical Optimization Model for Locating and Fortifying Capacitated Warehouses under Risk of Failure

Authors : Tareq Oshan

Abstract : Facility location and size decisions are important to any company because they affect profitability and success. However, warehouses are exposed to various risks of failure that affect their activity. This paper presents a mixed-integer non-linear mathematical model that can be used to determine optimal warehouse locations and sizes, which warehouses to fortify, and which branches should be assigned to specific warehouses when there is a risk of warehouse failure. Every branch is assigned to a fortified primary warehouse or a nonfortified primary warehouse and a fortified backup warehouse. The standard method and an introduced method, based on the average probabilities, for linearizing this mathematical model were used. A Canadian case study was used to demonstrate the developed mathematical model, followed by some sensitivity analysis.

Keywords : supply chain network design, fortified warehouse, mixed-integer mathematical model, warehouse failure risk
Conference Title : ICSCML 2021 : International Conference on Supply Chain Management and Logistics
Conference Location : Dubai, United Arab Emirates
Conference Dates : July 29-30, 2021

Open Science Index, Industrial and Systems Engineering Vol:15, No:07, 2021 publications.waset.org/abstracts/139086.pdf