Oral Defense Announcement
University of Missouri – St. Louis Graduate School

An oral examination in defense of the dissertation for the degree
Doctor of Philosophy in Business Administration with an emphasis in Logistics & Supply Chain Management

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Containing Risk When Maximizing Supply-chain Performance

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Time: 10:00 a.m. to 12:00 p.m.
Place: 212 Express Scripts Hall

Abstract
The objective of this dissertation is to develop and test an approach that will quantify the level of disruption risk in the supply chain, evaluate the cost and impact of risk mitigation strategies, validate event management protocols pre-implementation, and optimize across a portfolio of risk mitigation strategies. The research integrates a Mixed Integer Linear Programming (MILP) model and a Discrete Event Simulation model to investigate a location-production-transportation problem subject to risk. The MILP model calculates the optimal Net Profit Contribution of the supply chain in the absence of risk. Deviation risks are measured as volatility in final demand and lead times, with lead-time volatility affecting raw material lead times from suppliers to manufacturing plants, and finished goods lead times from manufacturing plants to the warehouses. Disruption risks are modelled as affecting production at the manufacturing plants, in-bound distribution of raw materials to the manufacturing plants, and out-bound distribution of finished goods from the manufacturing plants. Computational experiments are performed to examine the impact of risk on the supply chain. Further experiments explore the consequences of three risk mitigation strategies (inventory placement, expediting, and production flexibility) on supply chain performance in the presence of risk with the aim of discovering whether one strategy dominates or whether a combination of several strategies performs best. In sum, this research seeks to develop a modeling and solution framework that can inform efforts in understanding, planning for and controlling risk in the supply chain.

Defense of Dissertation Committee
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