

Managing Risk in the Supply Chain

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Managing risk is a critical task in supply chain management. Roughly speaking, supply chain risks can be placed into two categories, operational risks (demand-supply matching) and disruptive risks (sudden and unpredictable disruption of the supply process).

In this session we will discuss sources of supply chain risks and techniques for managing these risks. We'll begin with different contractual forms for allocating risk and different market exchanges for trading risk. We'll discuss recent research as well as propose directions for future research.

We then consider how supply chain management can be impacted through the use of financial engineering tools like

- Real Options
- Portfolio Optimization
- Deviation measures such as Mean-Variance and Conditional-Value-at-Risk
- Utility theory and concepts

All these instruments have been applied in financial environments but to a great extent not to supply chain management. Thus, the second half of the session will address the following questions:

1. What is the difference between the various deviation measures? Which one is appropriate for SCM?
2. What is the impact of applying the various risk measures on SC strategies?
3. How can the firm integrate operational and financial strategies to better manage the trade-off between expected profit and risk?

Of course, it is important to emphasize the challenges of supply chain problems compared to traditional financial models. Indeed, in finance, portfolio and investment decisions can be reversed in the sense that investors can sell whatever assets they hold at any time; in manufacturing, however, once inventories are ordered, or produced, they are written off at a high cost, i.e., sold at a low salvage value, since the components are engineered for a particular manufacturer. This difference requires modifying financial engineering tools to supply chain problems.

Finally, the insurance industry has developed methods for managing risk. Is there anything that is applicable to supply chain management?