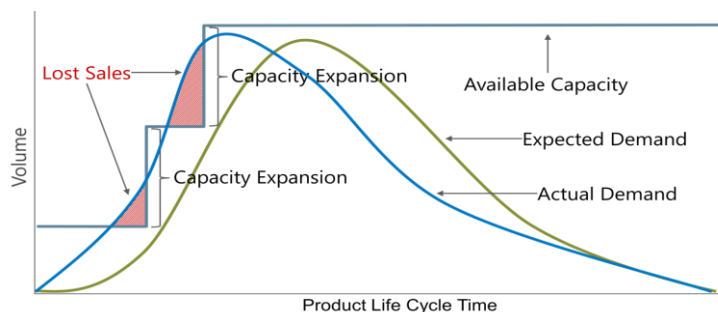


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MAY 2021 Research Fest

Motivation / Background

Companies often need to make strategic capacity investment decisions while there is still significant uncertainty in their demand forecasts. These decisions become increasingly complex when considering NPI with extended supply chains, as inventory and manufacturing capacity investments must be evaluated versus the risk of lost sales.



Research Question

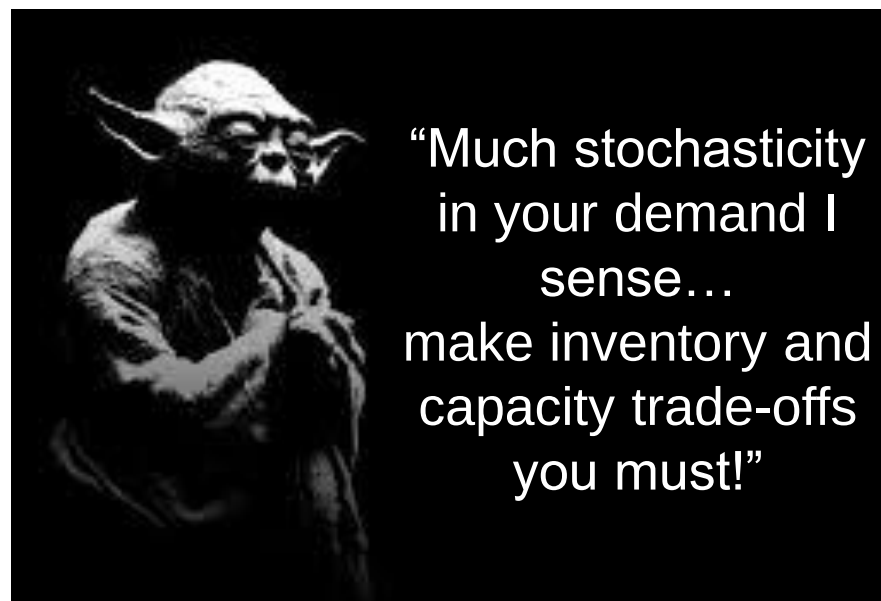
What are the tradeoffs between supply chain investments and the risk of lost sales under demand uncertainty due to new product introductions in multi-tier strategic capacity planning?

Relevant Literature

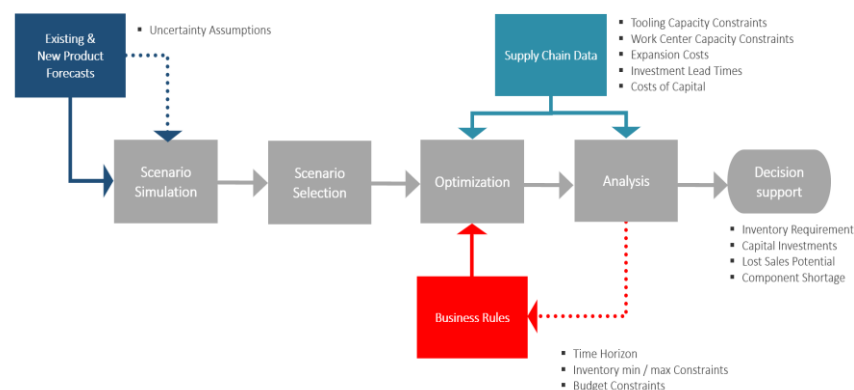
Bass, F. M. (1969). A New Product Growth for Model Consumer Durables. *Management Science*, 15(5), 215–227. <https://doi.org/10.1287/mnsc.15.5.215>

Phadnis, S. S. (2012). Influencing Managerial Cognition and Decisions Using Scenarios for Long-range Planning. Massachusetts Institute of Technology.

Van Mieghem, J. A. (2003). Capacity Management, Investment, and Hedging: Review and Recent Developments. *Manufacturing & Service Operations Management*

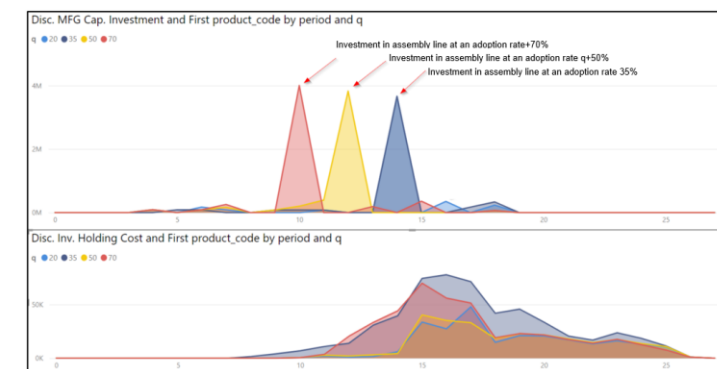


Methodology



Insights

- The interactions within complex supply chains, although generally intuitive, are too complex for SME's to effectively manage within simple tools.
- Incorporating demand uncertainty into a robust scenario analysis can reveal the less intuitive capacity bottlenecks and tradeoffs within complex supply chains.
- Effective visualization tools are crucial for the evaluation of tradeoffs between alternative scenarios.



Contributions

This project provides a methodology to support effective investment decision-making, including the contributions of:

- Methodology for simulating “New-to-World” NPI based on adoption rate and market potential
- Incorporation of BI into scenario evaluation

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