The Impact of Product Portfolio Complexity on Truck Utilization

Motivation / Background
Some chemical divisions are shifting to a commodity industry. Product portfolio complexity is affecting the Supply Chain.

- 60 different products
- 23 redundant products
- 3,000+ customers
- 100+ trucks

Key Question / Hypothesis
How is truck utilization affected by:
- Number of products in the portfolio?
- Replacing redundant products?
- Demand variability?
- Lead time variability?

Initial Results
Parameters were evaluated independently, allowing to understand which of them affect truck utilization.

- Demand served increases with product replacement

Methodology
Through Monte Carlo simulation we developed a tool to analyze the impact of 6 parameters in truck utilization.

- Average demand per product
  - Standard deviation
- Quantity of trucks
- Average truck speed
- Average distance per trip
  - Standard deviation
- Average stops per trip
- Delivery lead time

Expected Contribution
- Help the sponsor understand the impact of decisions to the fleet size with an Excel tool
- Analysis of real data and recommendations for fleet optimization
- Correlation function between complexity and number of trucks

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Relevant Literature