Abstract: Decision Support for Lead Time and Demand Variation Reduction

Companies undertaking operations improvement in supply chains face many alternatives. This work seeks to assist practitioners to prioritize improvement actions by developing analytical expressions for the marginal values of three parameters-- (i) lead time mean, (ii) lead time variation, and (iii) demand variation– which measure the *marginal* cost of an incremental change in a parameter. The relative effectiveness of reducing the lead time mean versus lead time variability is captured by the ratio ofthe marginal value of lead time mean to the marginal value of lead time variation. We find that the value of this ratio strongly depends on whether the lead time mean and variance are independent or correlated. We illustrate the application of the results with a numerical example from an industrial setting. These insights can help managers make tradeoffs among investment decisions to modify demand and supply characteristics in their supply chain, e.g., by switching suppliers, factory layout, or investing in information systems.