

Title: Integrated Strategic Planning of Global Production Networks and Financial Hedging under Uncertain Demands and Exchange Rates

Abstract:

In this paper we present a multi-stage stochastic programming model for integrated planning of strategic production network design and financial hedging under uncertain exchange rates and product demands. The model considers costs of production plants and revenues of markets in different currency areas. Financial portfolio planning decisions on two types of financial instruments, namely forward-contracts and options, are explicitly represented by multi-period decision variables and a multi-stage scenario tree. On the basis of an illustrative case example we analyse the impact of exchange rate and demand volatility, the level of investment expenses and interest rate spreads on capacity location and dimensioning decisions. Furthermore, we show that the integrated model results in better strategic planning decisions for a risk averse decision maker compared to traditional modeling approaches.