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Niels Bugerta, Rainer Lascha

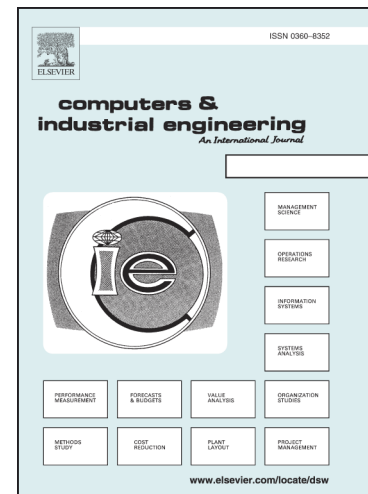
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Effectiveness of Responsive Pricing in the Face of Supply Chain Disruptions

Niels Bugert^a, Rainer Lasch^a,

^a*Chair of Business Management, esp. Logistics, TU Dresden, Germany*

Abstract

Disruptions of the material flow can cause serious financial damage for supply chain partners to the extent of even jeopardizing their survival. To cope with this hazard, several proactive and reactive mitigation strategies have been suggested in the research literature of supply chain risk management. To our knowledge, only back-up supply and structural changes of the information flow have been incorporated by network level simulation models. Moreover, a detailed assessment of the disruption length's effect on the resulting costs of a disruption is still missing. We have conducted a simulation study with system dynamics, split into three simulation experiments, to quantify the disruption costs subject to various disruption lengths and to evaluate the effectiveness of responsive pricing regarding the costs saved as well as the order fulfillment rate. We have analyzed the height of the price change and the operating time of this reactive strategy to be able to provide insights into the general behavior of the system and the strategy. For this purpose and since no real supply chain data has been available, we have extended the approach of Wilson (2007) to a two-product model with monetary parameters. A uniform space-filling approach combined with Kriging interpolation has been selected to create response surfaces for two of our three research questions. Our study reveals that there is a disproportionate influence of the disruption length on the overall disruption costs. In our model, the effect of the height of the price change is significant. The ideal height of price change initially increases for longer disruptions until an optimum range is reached. The operating time of the price change has a smaller effect on the effectiveness. Despite the fact that the effectiveness can be further optimized by considering the operating time, our study indicates that near-optimum results can be obtained by having responsive pricing in effect for the acute time span of the disruption.

Keywords: Supply Chain Disruptions, Responsive Pricing, Supply Chain Risk Management, System Dynamics

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