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Forecasting Supply Chain Performance Resilience Using Grey Prediction

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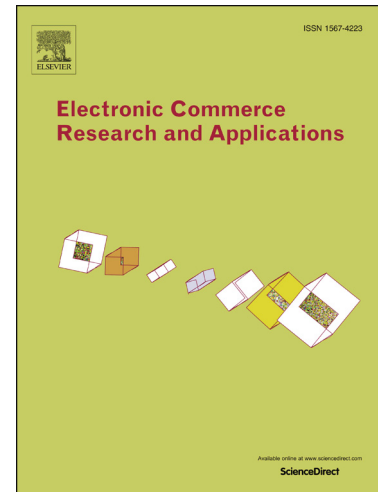
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**FORECASTING SUPPLY CHAIN PERFORMANCE RESILIENCE
USING GREY PREDICTION**

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ABSTRACT

New digital technologies have empowered companies to make use of tools to produce insights for key supply chain processes. Resilience, the property of supply chains to respond better to disruptions, can be identified and evaluated using performance indicators. This research analyzes and predicts the indicators of firm resilience based on indicators from secondary data. These indicators can be measured on a regular basis based on performance in flexibility, responsiveness, quality, productivity and accessibility. Since source information for the data is often unknown, a methodology that is suited for prediction needs to be used. An improved grey prediction model is proposed in this research for forecasting the periodic indicators of resilience performance. This research shows that error measures ensure the best fit of the data to achieve strong prediction capability. A prediction model is applied to the supply chain of an Indian electronics manufacturer to forecast the measures of its resilience. Also, the results obtained were validated and have practical implications. For the supply chain that we studied, the indicators of flexibility, responsiveness and accessibility increased for the future periods, whereas the indicators for quality and productivity showed slight decreases. We argue that indicators with a negative trend should be given more attention by the firm. And managers should analyze the predicted values of resilience so they have an empirical basis for adjusting their strategies.

Keywords: Big data; grey theory; grey prediction; supply chain resilience; resilience indicators

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