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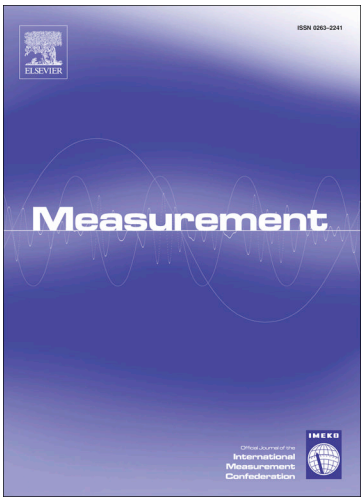

Measuring the barriers to resilience in manufacturing supply chains using grey clustering and vikor approaches

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MEASURING THE BARRIERS TO RESILIENCE IN MANUFACTURING SUPPLY CHAINS USING GREY CLUSTERING AND VIKOR APPROACHES

Abstract

Supply chains of today are interconnected intricate networks prone to copious internal and external turbulences. Building resilient supply networks are the possible solutions to reduce, handle, and mitigate the concomitant risks. This research attempts to identify, classify, and measure those barriers in achieving resilience, typically seen in electronic manufacturing supply chains. A methodology incorporating grey clustering algorithm and compromise ranking (VIKOR) methods were used for the classification and measurement of the barriers to supply chain resilience. Managers could perform an initial sorting of the barriers using the grey clustering algorithm to identify those barriers coming under the *high importance* categories. Then, the VIKOR analysis could be conducted on the selected barriers to effectively prioritize them. The obtained results were subject to sensitivity analysis and were validated using practical case implications. By implementing the proposed methodology for the considered case, the following barriers were identified to be most important; *bull whips due to uncertainties in supply*, *single sourcing*, *centralization of assets* and *inability to modify operations in response to challenges.* Key managerial implications of the study is that, measuring barriers for reducing supply chain vulnerabilities could lead to better enactment of supply networks with enhanced resilience capabilities.

Keywords: Manufacturing supply chains; Supply chain resilience; Measuring resilience barriers; Grey clustering; VIKOR

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