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Title : «Predicting Supply Chain Disruptions through Machine Learning: A Network- Based Risk Management Approach».

Astarct

In an increasingly interconnected global economy, supply chain disruptions pose significant risks to business continuity and economic stability. This study proposes a novel approach to predicting supply chain disruptions using machine learning integrated with a network-based risk management framework. By employing the Global Vector Autoregressive (GVAR) methodology, we capture the interdependencies and spillover effects among countries, sectors, and firms embedded in complex supply chain networks. Our methodology utilizes high-frequency macroeconomic, trade, and logistics data and applies machine learning algorithms in order to identify early-warning signs of possible disruptions. Dynamic analysis through the GVAR model allows analyzing local shocks and their transmission along the global supply chain, increasing forecasting precision and risk estimation. The outcomes verify the efficacy of integrating machine learning with GVAR for identifying systemic vulnerabilities and enhancing resilience in supply chain management. This study will add value to the literature by providing a strong, fact-based framework for proactive risk mitigation in global supply chains.