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Special Issue Reprint

Theoretical and Applied Mathematics in Supply Chain Management

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This Reprint on *Quantitative Supply Chain Management* features research that applies advanced analytical and optimisation methods to diverse supply chain challenges. Topics include procurement coordination using swap and wholesale contracts, facility location under uncertain demand with distributionally robust optimisation, inventory control under demand shocks and deteriorating items, and strategic interactions in shared infrastructure using evolutionary game theory. Other contributions explore shortage policies with complex batch arrivals, emission-reduction technology decisions in port supply chains, and cost-optimised maintenance planning for offshore wind farms that considers weather-dependent failure rates. Collectively, these studies demonstrate how quantitative models—ranging from stochastic programming and game theory to robust and fuzzy optimisation—can improve decision-making, resilience, and sustainability in modern supply chains. This Reprint highlights how quantitative models—ranging from mixed-integer optimisation to simulation and artificial intelligence—can effectively support decision-making in real-world logistics, manufacturing, and service systems.

Designed for researchers, practitioners, and postgraduate students in operations research, industrial engineering, and logistics, this Reprint aims to inspire the development and application of robust quantitative methods that drive innovation and strategic decision-making in modern supply chain management.

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