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경제정책 불확실성과 한국 주식시장의 교차 군집행동 분석: Dynamic Time Warping 기반 접근

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Economic Policy Uncertainty and Cross-Sector Clustering in the Korean Stock Market: A Dynamic Time Warping Approach

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Abstract

This study examines how Economic Policy Uncertainty (EPU) affects cross-sector return path similarity and clustering in the Korean stock market. Using monthly log-returns from major KOSPI industry indices (2000-2024), we apply Dynamic Time Warping (DTW) to measure nonlinear similarities and construct distance-based networks. Results show that in low-EPU periods, industry returns exhibit strong co-movement and form compact clusters centered on manufacturing. In contrast, high-EPU periods feature fragmented structures, with increased DTW distances and shifting centrality toward finance and communication sectors. Minimum Spanning Tree (MST) analysis further confirms a dispersed network and reduced synchronization under elevated uncertainty. These findings highlight the role of macroeconomic uncertainty in reshaping market structures and suggest that DTW-based clustering is useful for assessing systemic risk and inter-industry linkages. The study provides practical insights for policymakers and investors seeking to monitor risk transmission in volatile environments.

Keywords: Economic Policy Uncertainty, Dynamic Time Warping, Industry Clustering, Network Analysis, Systemic Risk

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