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stock and commodity futures markets

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# Extreme time-frequency connectedness across U.S. sector stock and commodity futures markets

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## Abstract:

This study delves into the extreme time-frequency return connectedness between ten U.S. sectors and commodities from January 2014 to May 2023. Using quantile timefrequency measures, we find the following: Firstly, the total connectedness estimates are more sensitive at shorter frequencies than at longer ones. Secondly, the study reveals varied degrees of contagion during crisis periods. Notably, during COVID-19 (Russia-Ukraine conflict), the contagion is driven by short-term (long-term) shocks, specifically during the bearish (bullish) phase. Thirdly, quantile connectedness measures depict intense correlations around market extremes, underlining dynamic net return-contagion with tailored risk strategies. The shifts in shock transmission roles during bearish and bullish scenarios, along with evolving dynamics across timefrequency horizons, emphasize substantial interconnectedness within the network. Findings suggest limited diversification scope under extreme market conditions, informing investment decisions, risk management, and portfolio optimization.

Keywords: US sectoral indices, Commodity markets, quantile spillover, time-frequency analysis, portfolio management, COVID-19, geopolitical crisis.