

Return and Volatility Spillovers between Green Financial Assets and Innovation-driven Technology Sectors

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ABSTRACT

This study investigates return and volatility spillovers between green financial assets—green bonds, clean energy, and ESG equities—and a range of innovation-driven technology sectors, including AI, robotics, digital platforms, and decentralized finance. Using a DECO-GARCH and quantile connectedness framework, the analysis s both cyclical and crisis-driven dynamics. The results reveal that connectedness intensifies shows under extreme market conditions, with volatility spillovers persistently exceeding return spillovers across all regimes. Volatility also exhibits strong persistence, particularly during and after crisis periods, indicating prolonged market sensitivity and risk clustering. Connectedness is asymmetric and state-dependent, peaking during downturns and reducing diversification opportunities when they are most needed. Green bonds, clean energy, and the space sector consistently act as net receivers of return and volatility spillovers, suggesting they may serve as safe havens and portfolio diversifiers. Conversely, digital and innovation-led sectors—such as decentralized banking, AI, and smart factories—alongside the S&P ESG index, generally function as net transmitters of shocks, especially during turbulent phases. These findings underscore the importance of tail- sensitive and volatility-aware investment strategies. For policymakers, monitoring volatility- based spillovers and systemic nodes is crucial for safeguarding stability. Societally, the defensive behavior of green assets highlights their dual value: supporting environmentalobjectives while enhancing financial system resilience during times of heightened uncertainty.

JEL Codes:

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