

Novel testing of risk transmission for renewable energy and fossil fuel ETFs during the financial crisis and COVID-19 pandemic

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Abstract: Investment in green or renewable energy entails significant financial risks. In financial markets, risk transmission is critical in selecting suitable hedging instruments such that there is a negative covariance between the cross-returns of assets; this ensures that large losses in one financial asset are offset by positive returns (preferably in similar amounts) in the hedging instruments. This study proposes a novel risk transmission analysis in the portfolio of energy assets. A negative risk transmission implies that bad news in one energy market causes small changes of risk in the portfolio. Moreover, we can also look at the transmission of “risk volatility”, a negative transmission that implies that whether there is bad news or good news in one energy market, there is little effect of risk in the portfolio. Thus estimating the covolatility of an energy portfolio can help us understand how news variation in one energy asset can cause risk changes in an energy portfolio so one can improve the risk management of energy assets. Three renewable energies: solar, wind, and water, and three fossil fuel energies: crude oil, coal, and natural gas exchange-traded funds were used to test risk transmission effects during the global financial crisis and the COVID-19 pandemic. The empirical results show that the risk transmission effect is completely different from that during the GFC and before the COVID-19 pandemic.

Keywords: Renewable energy, fossil fuels, financial risks, volatility, GFC, COVID-19