Unraveling Environmental Threads: Non-Linear Causality in Bitcoin Prices, Energy Consumption, and Crypto Market Volatility

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Abstract

With a market capitalization of US$1 trillion, Bitcoin has established itself as a decentralized asset for investors worldwide. However, Bitcoin uses a lot more energy than nations like Finland, Israel, Belgium, or Bangladesh. The carbon impact of this enormous usage is around 55.04 mt CO2. We look for a nonlinear correlation between the energy used by Bitcoin, its price (BP), and the Crypto Volatility Index (CVI). This study makes use of 1100 daily observations from various datasets between March 23, 2020, and March 30, 2023. We use the Diks and Panchenko (2006) causality based on lags specified using Vector Autoregression (VAR) to analyze the relationship between the BP, CVI, and Bitcoin-based power consumption (proxied by Cambridge Bitcoin Electricity Consumption Index). A NonLinear Granger causality test also based on VAR is used to check for the robustness of the findings. It was discovered that the past values of Bitcoin prices provide information that aids in predicting the future values of Cryptocurrency Volatility. The relationship between CBECI and BP remains unexplained, opening doors for future research. Green Investors and policymakers can use the results to frame policies regarding sustainable trading of crypto assets.

Keywords Carbon Emission; Cryptocurrency; Value investing theory; Global Warming; Sustainable Investing