

ABSTRACT

This paper investigates the change in the dynamic relationship between energy markets with the growth in clean energy investments, under the influence of currency prices. This study introduces a significant contribution by employing multivariate wavelet methodology to decompose the signals into time-frequency representation. We consider the daily returns for three primary energy variables and four secondary variables. Against the backdrop of the global clean energy transition, there is an increased importance for the role played by clean energy in the world energy market, not limited to fuels itself but beyond. To dissect the effect of clean transition, and energy and economic crisis on this multivariate relationship, we build a time-varying correlation structure across nine frequency levels using WLMC and WLMCC. In order to understand the aggregate directional risk contagion in the energy nexus, we also undertake spillover analysis using TVP-VAR. Our cumulative results indicate significant structural breaks coinciding with a deep correction in energy prices. Further, there is significant evidence to advocate the effect of correlation being led by distinct variables across time and frequency. This evidence hints toward the dynamic pattern shift in the energy nexus during the period of study. Our results have essential implications for various stakeholders including policymakers and portfolio managers who have different time horizons and keen to understand the risk contagion in the energy market.

Keywords: Energy, Clean Energy, Wavelets, WLMC, TVP-VAR, Frequency

JEL Classification: G11, G15, Q42, C58