

Oil Prices and the Renewable Energy Sector

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Executive summary

Despite the ongoing transition of energy markets, crude oil is still the dominant energy source in the world accounting for 36.9% of global primary energy consumption in 2016. The renewable energy sector, however, has been experiencing remarkable growth over the past decade, and expectations for large-scale deployment of renewables have also been raised for years to come. In this study, we focus on the financial performance of the renewable energy companies, which is of critical importance in the future development of the renewable energy sector due to its positive relationship with private capital acquisition for infrastructure investments. We investigate the effects of oil price shocks, and also of uncertainty about oil prices, on the stock returns of clean energy and technology companies.

We use monthly data that span the period from May 1983 to December 2016 and a bivariate structural VAR model, modified to accommodate GARCH-in-Mean errors as in Elder and Serletis (2010), to directly investigate the effect of oil price uncertainty on the employed stock returns. In particular, we use monthly closing prices of the clean energy indices, as well as a technology index and the aggregate U.S. stock return. As a measure of the oil price, we use the nearest month West Texas Intermediate crude oil futures price. For robustness purpose, we also use the composite refiner's acquisition cost of crude oil, as compiled by the U.S. Department of Energy.

Furthermore, we conduct an impulse response analysis to explore whether the response of stock returns to positive and negative oil price shocks is symmetric or asymmetric, after accounting for the effects of oil price uncertainty. As an additional contribution to the literature, we use a test, recently introduced by Kilian and Vigfusson (2011), and examine over the same data set the asymmetry of stock responses to oil price shocks of different magnitude.

Our main result is that oil price uncertainty has no statistically significant effect on the financial performance of the renewable energy sector, and that stock returns respond symmetrically to oil price shocks, irrespective of their size. The insignificant effect of oil price uncertainty on the employed stock returns might be a possible explanation for the symmetric stock responses. Our finding for symmetric response of aggregate returns to oil price shocks is consistent with Alsalman and Herrera (2015). Overall, our results show

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resilience of renewable energy stock returns to oil price uncertainty. Our evidence is robust to alternative model specifications and stock prices of clean energy companies.

Keywords Renewable energy, Transition, Oil prices, Uncertainty, GARCH-in-Mean model, Asymmetric responses.