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**IMPACT OF OIL PRICE CHANGES ON STOCK RETURNS OF UK OIL AND GAS COMPANIES: A WAVELET-BASED ANALYSIS****Abstract:**

The relationship between oil and stock is important because oil is the key production input for most industries and stock market performance, to some extent, reflects the economic conditions. However, the relationship between oil price and stock prices of oil and gas industry companies is more complex because oil plays the roles as both costs and profits for this kind of company. Unlike previous research of the relationship between oil and oil and gas companies using randomly chosen data frequencies and only based on time domain, we examine the impact of oil price changes on stock returns of UK oil and gas companies through various time scales during the sample period from June 19, 1996 to December 30, 2016 by using both continuous wavelet transform and discrete wavelet transform. We found the following several important results: First, the dependence between oil and UK oil and gas companies' stocks is weak in the short term but higher in the medium-run and long-run. Second, the Granger causality running from oil to stock on daily basis is limited but the significant bidirectional Granger causality relations running between the oil price and oil and gas stock prices can be observed at scale 3, 4 and 5. Moreover, the oil price shocks at these scales have significant negative and positive effects on stock prices of UK oil and gas companies. Third, the short term oil price risk is very weak, which means that short-term UK oil and gas industry investors can still diversify the risk of their portfolios by adding oil, however, the long-term investors should be more concerned about oil price risk.

**Keywords:**

Oil prices; Oil and gas; Granger causality; Multiscale; Wavelet coherence