

# The dynamic time-frequency relationship between international oil prices and investor sentiment in China: A wavelet coherence analysis

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## Executive summary

With the development of the financialization of commodities, crude oil has gradually begun to share some of the properties of financial products, and its prices are now more closely related to non-fundamentals. Therefore, the co-movement relationship between oil prices and non-fundamental factors is gaining attention from investors and scholars. The concept of investor sentiment in the field of behavioral finance is one of the most concerned non-fundamental factors. As we know, the crude oil market involves a variety of agents with objectives rooting in various time horizons. For example, policymakers with the primary concern of market equilibriums in the long term, companies with production and operation cycles ranging from several months to several years and investors with different investment strategies and so on. The effects of all these market components with various frequencies could be heterogeneous. However, the dynamic relationships between investor sentiment and crude oil price at different frequencies are still hidden in the previous research.

Therefore, we take a fresh look at this relationship from the novel perspective of both the time and the frequency domains. First, we construct investor sentiment in the Chinese stock market through two-stage principal component analysis. Then, crude oil prices are decomposed into three oil price shocks, namely an oil supply shock, an aggregate demand shock, and an oil-specific demand shock, through a structural vector autoregression model. Lastly, the dynamic relationship between investor sentiment and oil prices is comprehensively studied from both the time and the frequency domains via wavelet coherence analysis.

Our results confirm the leading position of crude oil prices in the co-movement relationship with investor sentiment. In particular, the impacts of crude oil prices on investor sentiment are always negative and the co-movement is more frequent in the relatively long term. Further, we distinguish the different effects of oil price shocks on investor sentiment at different times and frequencies. Specifically, all three exert a negative effect on investor sentiment. However, the effects of demand shocks are more common in the long term. In the short term, investor sentiment is usually affected by oil supply shocks. In addition, the dynamic dependency relationship between investor sentiment and oil-specific demand shocks is stronger than the other two oil prices shocks.

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**Keywords:** Investor sentiment; International oil prices; Wavelet coherence analysis; Co-movement.

**JEL Codes:** C22, C61, D84, E32, E44, G15