

# Small Trends and Big Cycles in Crude Oil Prices

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Is the continued surge in oil prices since 2001 reflecting a long-run upward trend arising from the “scarcity rent” or simply a cyclical movement? Can we predict the price of oil in the long-run? These are the questions that this paper seeks to answer.

Employing an unobserved components (UC) model, we disentangle the long-run trend from shorter-term cyclical patterns in the price of internationally traded crude oil using data from 1861 to 2010. We first demonstrate that the real price of crude oil is stationary around a U-shaped long-run trend with a significant structural break in 1973/1974. Two types of cycles stand out. The short cycle has a period of six years, commensurating with the length of a typical business cycle and the long cycle averages about 29 years. The length of the long cycle is plausible given the capital intensity, long gestation period, and uncertainties involved in upstream petroleum investment projects. The amplitude of the long cycle can be as much as 90

percent above or 45 percent below the long-run trend. Compared to the cyclical movements, however, the magnitude of the trend component is small.

The second part of the paper compares the out-of-sample forecasting performance of various econometric models with a no-change random walk forecast. We find that at the one-year horizon, the random walk forecasts tend to be the most accurate among the models considered, indicating the difficulty of predicting the price of oil purely based on econometric models at shorter horizons. At horizons of five and ten years, the trend-cycle models significantly improve the forecast accuracy compared to the random walk forecasts and as the forecasting horizon lengthens, the accuracy gains of the trend-cycle models increase. The results are consistent with the fact that the oil price is a slow mean reversion process and, as shocks dissipate over time, the price eventually reverts to its long-run trend. Moreover, it also demonstrates the importance of modeling the cyclical behavior of oil prices in long-term forecasting. The results hold for both real and nominal oil prices and are robust to the choice of forecasting windows.