

# On the Oil Price Uncertainty

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## **Executive summary**

This study investigates the dynamics of oil price volatility and uncertainty over the period January 1986–December 2018, covering the different phases that witnessed oil price increases and slumps. Both volatility and uncertainty must be analyzed to understand and explain the important changes in oil prices over the last few decades. This is relevant because oil price changes affect households, investors, companies, and the entire economy. Interestingly, while previous studies have analyzed oil volatility, the focus on oil price uncertainty and its effects is rather limited, and this may be explained by the complexity and difficulty in measuring and modeling oil price uncertainty. This is also why related previous studies provide inconclusive results about oil price uncertainty. Accordingly, in line with Poon and Granger (2003) and Teräsvirta and Zhao (2011), we propose three different specifications of stochastic oil volatility: standard stochastic volatility, stochastic volatility moving average, and leverage stochastic volatility models. The class of stochastic volatility is recommended because unlike other methodologies in the family of conditional variance models (ARCH, GARCH, etc.), it offers a more flexible and less restrictive framework to model oil volatility. Furthermore, with these three different specifications of stochastic volatility models, it is possible to capture the different observed stylized facts in oil data: asymmetry, leptokurtic excess, outliers, extreme values, and nonnormality. Besides, this study proposes an innovative exercise for oil price uncertainty forecasting. We compute the out-of-sample forecasts of oil price uncertainty using the estimates

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of these three stochastic oil price volatility models. Our findings show that the standard stochastic volatility model outperforms the other two models when focusing on oil price uncertainty. This finding is particularly relevant to better forecast and understand the effects of oil price uncertainty on the entire real economy.

**Keywords:** Oil volatility, oil price uncertainty, stochastic volatility models, forecasting.

**JEL Codes:** C32, Q40, Q47.