A three-factor model of commodity prices

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This paper analyzes a three-factor model for commodity prices. We expand the Gibson and Scwhartz (1990) [3] model introducing a third factor. In the two-factor model the authors use the spot price and convenience yield as non-observable variables. We include the long-run average of the convenience yield as a third stochastic factor. It was modeled as a mean-reverting process. The final model is affine and Gaussian. We proceeded the calibration using the Kalman filter. The hyperparameters and the latent variables were estimated. Finally, we compared the two and three-factor models regarding the term structure of future prices and volatilities.

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