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*From Spot to Forward Stochastic Volatility Models for Commodities*

It is well known that stochastic volatility is an essential feature of commodity prices. By using methods of singular perturbation theory, I will show how to obtain approximate but explicit closed form pricing equations for forward contracts and options on single- and two-name forward prices. Both spot and forward price commodity models, based on a fast mean-reverting stochastic volatility driving factor, will be explored. For spot price models the single factor mean-reverting spot model as well as a two-factor generalization, in which the long-run mean is itself mean-reverting, are extended to include stochastic volatility. For forward price models, I will adopt an HJM-like framework with stochastic volatility extensions and include an unspanned volatility source. The various approximation formulas produce realistic implied volatility smiles and are useful calibration and pricing tools.