Co-Integrated Commodity Forward Pricing Model

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Abstract : Commodities pricing needs a specific approach as they are often linked to each other and so are expectedly doing their prices. They are called co-integrated when at least one stationary linear combination exists between them. Though widespread in economic literature, and even if many equilibrium relations and co-movements exist in the economy, this principle of co-movement is not developed in derivatives field. The present study focuses on the following problem: How can the price of a forward agreement on a commodity be simulated, when it is co-integrated with other ones? Theoretical analysis is developed from Gibson-Schwartz model and an analytical solution is given for short maturities contracts and under risk-neutral conditions. The application has been made to crude oil and heating oil energy commodities and result confirms the applicability of proposed method.

Keywords : co-integration, commodities, forward pricing, Gibson-Schwartz
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