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## **A STOCHASTIC FACTOR MODEL FOR RISK MANAGEMENT OF COMMODITY DERIVATIVES**

### **Abstract:**

In the last two years, the world crude oil prices have dropped dramatically, and consequently the oil market has become very volatile and risky. Since energy markets play very important roles in the international economy and have led several global economic crises, risk management of energy products prices becomes very important for both academicians and market participants. We apply Schwartz and Smith's model (2000) to calculate risk measures of Brent oil futures contracts and light sweet crude oil (WTI) futures contracts. The model includes a long-term factor and a short-term factor. We show that the two factors explain the Samuelson effect well and the model present well goodness of fit. Our backtesting results demonstrate that the models provide satisfactory risk measures for listed crude oil futures contracts. A simple estimation method possessing quick convergence is developed.

### **Keywords:**

Factor model, Samuelson effect, value-at-risk, least square estimation.

**JEL Classification:** C58, G13, G32