

Pricing Discretely-Sampled Variance Swaps on Commodities

C. Chunhawiksit¹ and S. Rujivan²

Abstract: This paper extends an analytical approach proposed by Rujivan and Zhu (2012) to derive the fair delivery price of discretely-sampled variance swaps on a commodity with the realized variance defined in terms of squared percentage return of the underlying commodity prices. We assume the commodity prices follow Schwartz (1997) one-factor model which is adopted to describe the stochastic behavior of commodity prices. Furthermore, we demonstrate the validity of our closed-form solution and its implication to the theory of storage. This paper would be a next generation approach to price discretely-sampled variance swaps in a simple way and induce researchers to adopt our approach to price commodity derivatives such as volatility and gamma swaps based on other diffusion processes.

¹ School of Science, Walailak University
222 Thaiburi, Thasala District, Nakhon Si Thammarat 80161, Thailand
chonnawat@gmail.com

² Division of Mathematics and Statistics, School of Science, Walailak University
222 Thaiburi, Thasala District, Nakhon Si Thammarat 80161, Thailand
rsanae@wu.ac.th