

Accepted Manuscript

Seasonal Stochastic Volatility: Implications for the Pricing of Commodity Options

Juan C. Arismendi, Janis Back, Marcel Prokopczuk, Raphael Paschke, Markus Rudolf

PII: S0378-4266(16)00039-X

DOI: <http://dx.doi.org/10.1016/j.jbankfin.2016.02.001>

Reference: JBF 4898

To appear in: *Journal of Banking & Finance*



Please cite this article as: Arismendi, J.C., Back, J., Prokopczuk, M., Paschke, R., Rudolf, M., Seasonal Stochastic Volatility: Implications for the Pricing of Commodity Options, *Journal of Banking & Finance* (2016), doi: <http://dx.doi.org/10.1016/j.jbankfin.2016.02.001>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Seasonal Stochastic Volatility: Implications for the Pricing of Commodity Options

Juan C. Arismendi,^{*} Janis Back,[†] Marcel Prokopczuk,[‡]
Raphael Paschke,[§] and Markus Rudolf^{¶||}

Abstract

Many commodity markets contain a strong seasonal component not only at the price level, but also in volatility. In this paper, the importance of seasonal behavior in the volatility for the pricing of commodity options is analyzed. We propose a seasonally varying long-run mean variance process that is capable of capturing empirically observed patterns. Semi-closed-form option valuation formulas are derived. We then empirically study the impact of the proposed seasonal stochastic volatility model on the pricing accuracy of natural gas futures options traded at the New York Mercantile Exchange (NYMEX) and corn futures options traded at the Chicago Board of Trade (CBOT). Our results demonstrate that allowing stochastic volatility to fluctuate seasonally significantly reduces pricing errors for these contracts.

JEL classification: G13

Keywords: Commodities, Seasonality, Stochastic volatility, Options pricing, Natural gas, Corn

^{*}Faculty of Economics, Federal University of Bahia, R. Barão de Jeremoabo, 668-1154 - Ondina, Salvador - BA, 40170-115, Brasil

[†]Department of Finance, WHU – Otto Beisheim School of Management, 56179 Vallendar, Germany. e-mail: janis.back@whu.edu

[‡]School of Economics and Management, Leibniz University Hannover, Koenigsworther Platz 1, 30167 Hannover, Germany

[§]University of Mannheim, L5-2, 68131 Mannheim, Germany. e-mail: paschke@uni-mannheim.de

[¶]Department of Finance, WHU – Otto Beisheim School of Management, 56179 Vallendar, Germany. e-mail: markus.rudolf@whu.edu

^{||}Part of this work was completed while Janis Back was visiting Princeton University. He gratefully acknowledges financial support from the German Academic Exchange Service (DAAD).

Download English Version:

<https://daneshyari.com/en/article/5088399>

Download Persian Version:

<https://daneshyari.com/article/5088399>

[Daneshyari.com](https://daneshyari.com)