

Modelling conditional correlations in the volatility of Asian rubber spot and futures returns

Chia-Lin Chang^{a,*}, Thanchanok Khamkaew^b, Michael McAleer^{c,d,e},
Roengchai Tansuchat^b

^a Department of Applied Economics, National Chung Hsing University, 250 Kuo Kuang Road, National Chung Hsing University, Taichung 402, Taiwan

^b Faculty of Economics, Maejo University, Chiang Mai, Thailand

^c Econometrics Institute, Erasmus School of Economics, Erasmus University Rotterdam, The Netherlands

^d Tinbergen Institute, The Netherlands

^e Department of Economics and Finance, University of Canterbury, New Zealand

Received 10 January 2010; received in revised form 4 June 2010; accepted 6 July 2010

Available online 3 August 2010

Abstract

Asia is presently the most important market for the production and consumption of natural rubber. World prices of rubber are subject to not only to changes in demand, but also speculation regarding future markets. Japan and Singapore are the major future markets for rubber, while Thailand is one of the world's largest producers of rubber. As rubber prices are influenced by external markets, it is important to analyse the relationship between the relevant markets in Thailand, Japan and Singapore. The analysis is conducted using several alternative multivariate GARCH models. The empirical results indicate that the constant conditional correlations arising from the CCC model lie in the low to medium range. The results from the VARMA-GARCH model and the VARMA-AGARCH model suggest the presence of volatility spillovers and asymmetric effects of positive and negative return shocks on conditional volatility. Finally, the DCC model suggests that the conditional correlations can vary dramatically over time. In general, the dynamic conditional correlations in rubber spot and futures returns shocks can be independent or interdependent.

© 2010 IMACS. Published by Elsevier B.V. All rights reserved.

JEL classification: C22; C32; G17; G32; Q14

Keywords: Multivariate GARCH; Volatility spillovers; Conditional correlations; Spot returns; Futures returns

1. Introduction

Natural rubber is one of the most important agro-based industrial raw materials in the world. Rubber is produced entirely in developing countries. Asia is the largest producing region, accounting for around 96.6% of output in 2007, and Thailand is one of the world's biggest rubber producers. However, rubber prices are determined in the Singa-

* Corresponding author. Tel.: +886 04 22840350x309.

E-mail address: changchialin@nchu.edu.tw (C.-L. Chang).