



UNIVERSITY OF NAIROBI
SCHOOL OF MATHEMATICS

A Statistical Approach in Modeling Maize Prices Volatility

This research project is submitted to the School of Mathematics of the University of Nairobi in partial fulfillment of the requirement for the degree of Masters of Science in Social Statistics.

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July 2012

DECLARATION

This project as presented in this report is my original work and has not been presented for any other university award

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This project has been submitted as a partial fulfillment of the requirements for Masters of Science in Social Statistics of the University of Nairobi with our approval as the university supervisors:

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ABSTRACT

Volatility provides a measure of the possible variation or movement in the price of a commodity experienced over a given period of time and is measured using the standard deviation. In this study, volatility of maize prices for Kenya, Uganda, and Tanzania in comparison with the FAO Global prices for the period of January 2003 to August 2011 is estimated. The study employs measures of dispersion like unconditional standard deviation and the coefficient of variation together with a 20% band around the trend line compared with time series models, the ARMA and EGARCH. Maize prices in Kenya, Tanzania, and FAO Global were found to be time varying and thus estimated using the EGARCH model and the average unconditional standard deviation used as a measure of volatility. Volatility of Uganda maize prices was constant over time and was estimated using ARMA (1,1). Different from other studies that have investigated volatility of commodity prices in the region, we compare volatility as estimated by both measures of dispersion and time series models. The study shows that by both methods, maize prices in Uganda were the most volatile followed by Kenya, Tanzania and then FAO Global implying that volatility in the East African markets is high compared to the global maize market. The study finds time series models to be more appropriate in quantifying volatility than measures of dispersion because they account for the time varying pattern that is common in commodity prices and can be used to predict future volatility which can be used as a risk management tool.

Key words: volatility, Maize Prices, ARMA, EGARCH