

The Impact of Sudden Change on Long Memory between Japanese and Korean Stock Market

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The volatility of stock markets is affected substantially by infrequent sudden changes or regime shifts, corresponding to domestic and global economic events. Examples include the 1997 Asian currency crisis, the IT dot com bubbles, and the recent global crisis in 2007-2010. Such a sudden change in the underlying economy and or fundamentals is an important component of managing market risk and uncertainty, and in the construction of investment portfolios and the pricing of derivative securities. In addition, these changes have brought about stock volatility linkages or information transmission channels across domestic and international markets. In fact, it is important to take into account the possible existence of sudden changes in the time series behaviors of their volatilities.

This study assessed the impacts of sudden changes on volatility persistence or long memory, and then incorporated these impacts into the multivariate FIGARCH-CCC estimation in order to understand the information flow and volatility transmission between Korean and Japanese stock markets.

The principal objectives of this study are twofold: First, this study detects the sudden changes using the iterated cumulative sums of squared (ICSS) algorithm and evaluates the impact of sudden changes on volatility persistence using a univariate fractional integrated GARCH (FIGARCH) model. In particular, we examine whether the inclusion of sudden changes in the FIGARCH model reduces the coefficients of volatility persistence/ long memory or not. Second, this study takes into account those sudden changes to analyze accurately the origin, intensity and direction of volatility transmission between Korean and Japanese stock markets. We employ the CCC parameterization of the multivariate FIGARCH model which does not impose the restriction of constant correlation among variables over time. Our empirical finding might indicate that ignoring the sudden changes might overestimate the degree of volatility transmission that actually exists between the conditional variance of Korean and Japanese stock markets.

We conclude that ignoring sudden changes results may cause misinterpretations of the degree of volatility transmission that actually exists between the conditional variances of two stock markets. These findings provide important implications for building accurate asset price models, forecasting volatility of stock returns, managing market capitalization and further understanding information transmission mechanism.