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Abstract
This paper uses Markov switching regression model, Markov switching autoregression model and Markov switching Vector Error Correction model to examine economical and financial data in Taiwan. Applying nonlinear time series model tend to offer more correct empirical analysis and econometric specification in these two sectors.
Markov switching -regression model
In this section we discussed an inverse relationship between movement of Taiwan’s unemployment rate and real GDP whether existence Okun’s law form quarterly data covering the period 1964:1-2006:2. Further, we evaluate whether Okun's law has asymmetric effect under the expansions and the contractions by Markov regime switching model. we using Hodrick-Prescott filter model and Kalman filter model to distinguish the unemployment rate and real gross domestic product into trend component and cyclical components. Then, applying Markov regime-switching approaches, to examine whether the business cycle had the asymmetric effect. The empirical results displayed: (1) Taiwan has a significant Okun’s relationship. (2) After distinguish between trend components and cyclical component by using H-P filter model or Kalman filter model, overall the influence degree of the Okun’coefficient estimated form contractions is bigger than from expansions, it indicats the output-unemployment relationship as represented by Okun's law is asymmetric.
Markov switching -autoregression model
This section uses nonlinear–three state-Markov switching model to examine the market characteristic form 2001 to 2006 of Taiwan stock market, and can identify three contrasting regimes: speculative, bull and a bear market. The Empirical results show: (1) relative to other previous literature, the return and volatility of the speculative market are highest, over the period 2001-2002, the speculative market between the risky and higher return exists definitely on the stock market of Taiwan, and this result displays a casino characteristic of Taiwan stock market is substantiated by the present paper.（2）relative to previous literature, we find Taiwan exhibit a speculative market in earlier stage, has highest probability of bear market in this issue, this result does not exists buffer areas, investors are unable to predict transfer process of regimes at this moment. Taiwan stock market over the period 2001 to 2002, as a whole market conditions in the majority to be in the bear market or the speculative market, this displayed that stock investors not only faced losses of Securities investment but also highly volatility in a short time when stock price fluctuated and made a profit hugely.
Markov switching -Vector Error Correction model

This section uses nonlinear four-state-Markov switching Vector Error Correction model to examine the market characteristic form 1997 to 2006 of Taiwan stock market, and presents relationship between stock price and trading volumes in the identification of four contrasting regimes: high-bull regime; low-bull regime; high-bear regime; low-bear regime . The Empirical results show: (1) between the stock price and trading volumes in Taiwanese stock market have a cointegration relation, and display a long-term equilibrium state. (2) at switching process of each regime, the stock market trend likes a cycle. Average periods of high-bear regime are 1.5 weeks; average periods of low-bear regime are 9.11 weeks; average periods of low-bull regime are 2.97 weeks; average periods of high-bull regime are 1.4 weeks. (3) there is positive relationship between stock price and trading volumes. The short-term factor of stock price influenced is lag number of stock price. However, the short-term factors of trading volumes influenced are lag numbers of stock price and trading volumes. This shows that the bi-direction feedback exists in trading volumes.
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