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On the Feed-back Mechanism of Chinese Stock Markets

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Abstract

Feed-back models in the stock markets research imply an adjustment process toward investors' expectation for current information and past experiences. Error-correction and cointegration are often used to evaluate the long-run relation. The Efficient Capital Market Hypothesis, which had ignored the effect of the accumulation of information, cannot explain some anomalies such as bubbles and partial predictability in the stock markets. In order to investigate the feed-back mechanism and to determine an effective model, we use daily data of the stock index of two Chinese stock markets with the expectational model, which is one kind of geometric lag models. Tests and estimations of error-correction show that long-run equilibrium seems to be seldom achieved in Chinese stock markets. Our result clearly shows the common coefficient of expectations and fourth-order autoregressive disturbance exist in the two Chinese stock markets. Furthermore, we find the same coefficient of expectations has an autoregressive effect on disturbances in the two Chinese stock markets. Therefore the presence of such feed-back is also supported in Chinese stock markets.

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1. Introduction

A price-to-price feed-back theory of stock markets was frequently published in newspapers and magazines rather than scholarly journals while the Efficient Capital Market Hypothesis (ECMH) had become wildly accepted by financial economists in the 1970s. Feed-back models in the stock markets research imply an adjustment process toward investors' expectation for current information and past experiences. In order to investigate the feed-back mechanism and to determine an effective model, we use daily data of the stock index of two Chinese stock markets, Shanghai Stock Exchange and Shenzhen Stock Exchange, from January 2007 to June 2008 with the expectational model, which is one kind of geometric lag models.

Along with feed-back models, the other important concept is the dynamic long-run equilibrium. It is important for financial markets to contain the dynamic long-run equilibrium; otherwise there exists some arbitrage opportunities for investors. Error-correction and cointegration are often used to evaluate the long-run relation. If there are evidences to reject the hypothesis of cointegration, arbitrage opportunities could remain for a long time and feed-back mechanism could be considered existing in the long-run process.

The main contributions of this paper are to construct geometric lag models to trace the response of a stock market to the other stock market and to determine an effective model. We also perform the test of the long-run equilibrium of stock markets, in other words, we test error-correction or the cointegration in different stock market.

The rest of this paper is organized as follows. In the next section, we review some previous literature of the ECMH and error-correction theory. And we introduce the frame of error-correction or cointegration. We aslo describe expectational model which depicts explicitly the necessary structure of preferences that underlies the formation of expectation in Section 3. Section 4 focuses on data and methodology of this paper. An empirical analysis of the two Chinese stock market including statistical results and discussion of the feed-back of stock markets, are contained in section 5. The final section concludes.

2. Background

The ECMH was widely considered to be proved beyond doubt around 1970s under the rubric of the 'theory of random walks' in the finance literature and 'rational expectations theory' in the economics literature. Jensen (1978) pronounced 'there is no other proposition in economics which has more solid empirical evidence supporting it than Efficient Markets Hypothesis'.

Too many anomalies, however, which seemed to be inconsistent with the ECMH, had been observed all along. In light of the principles of the ECMH, the stock markets should have no memory, which means that the past stock prices could not have influence on the future prices, but many anomalies and events have fed skepticism. Lu, Ito, and Voges (2008) prove that returns recorded by the Shenzhen component index of China exhibit long memory processes.

Some financial economists and statisticians believe that stock prices are at least partially predictable. The stock prices' serial correlations might well reflect the process of people gradually understand the meaning of important events with a systematic cognitive pattern so that important events seem to be incorporated into stock prices slowly[1].

Two stock markets exist in China: Shanghai Stock Exchange and Shenzhen Stock Exchange. We are interested in understanding whether the information from a stock market will have a bandwagon effect on the other stock market. For example, how does the composite index at Shanghai Stock Exchange respond to the component index at Shenzhen Stock Exchange, or how does the component index respond to the composite index? Generally speaking, we have an intuition that trends of two stock markets have tended to move together; hence, a feed-back could exist in two stock markets.

According to the suggestion of Campbell, Lo, and MacKinlay (1997), even though the stock price is not stationary, there is a stationary linear combination of prices and dividends, so that prices and dividends are cointegrated, or have the error-correction form. In addition to dividends, popular variables, which may be forecasting variables for stock prices or returns, include ratios of price to dividends or earnings and various interest rate measures. We may assume that each stock index of two Chinese stock exchanges and some forecasting variables are cointegrated. Can we make use of the error-correction form to describe the relation between the component index and the composite index?

In modeling the response of economic variables to some stimuli, as one kind of geometric lag models, the expectational model developed by Nerlove has come to play an important role when a feed-back takes place. Nerlove (1958) systematically exploits psychological factors related to uncertainty of

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[1] According to the ECMH, however, the news spreads very quickly and is incorporated into the stock prices without delay.