The Quarterly Review of Economics and Finance 49 (2009) 843–857

Contents lists available at ScienceDirect

The Quarterly Review of Economics and Finance

journal homepage: www.elsevier.com/locate/qref

Deregulation and liberalization of the Chinese stock market and the improvement of market efficiency

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ARTICLE INFO

Article history:
Received 17 July 2008
Received in revised form 1 April 2009
Accepted 2 April 2009
Available online 24 April 2009

JEL classification:
G14
G15
G18

Keywords:
Variance ratio test
Efficient market hypothesis
Chinese stock markets
Deregulation

ABSTRACT

This study employs single and multiple variance ratio tests to reexamine the weak-form efficient market hypothesis (EMH) of A- and B-shares on the Shanghai and Shenzhen exchanges in Chinese stock market. The study also examines the influence of the release of investment restriction of B-share markets on market efficiency. For the whole sample period, the weak-form EMH is only supported for Shanghai A-shares, and is not supported for the remaining shares. For the sub-sample period, the Shenzhen A-share and B-shares of both exchanges being rejected for the weak-form EMH in the earlier sample period are supported following the regulatory change. Rolling multiple variance ratio test statistic values provide additional evidence of weak-form EMH. The improvement of market efficiency can be explained by the increased liquidity and maturity accompanying deregulation and liberalization.

1. Introduction

The exploration of whether the asset prices follow the random walk hypothesis (RWH) is of interest to not only academics, but also, practitioners and regulators. While a random walk process requires its successive price changes to be identical and independently distributed, a martingale process allows for uncorrelated price changes with a general form of heteroskedasticity. In other words, the martingale process is a generalized version of the random walk process. Briefly speaking, if an asset price follows the martingale process, its present and past prices cannot help us to forecast its future price. This is the essence of the weak-form efficient market hypothesis (EMH). Investors are always

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1062-9769/$ – see front matter
doi:10.1016/j.qref.2009.04.005

interested in identifying market inefficiency, which the behavior of asset prices might be characterized by predictable patterns (Fama, 1970, 1991). However, regulators mainly endeavor to create an efficient capital market, where newly released information can be instantly and fully reflected in asset prices and encourage buyers and sellers to rapidly make transactions with reasonable prices. Regulators anticipate providing efficient markets for investors since this will attract international capital to their market and stimulate economic growth.

The China government, through the China Securities Regulatory Commission (CSRC), announced to release investing restriction of B-share markets on 19 February 2001, which allows domestic residents to trade in B-share markets. An interesting topic that arises from this regulatory change concerns the efficiency of the stock markets, and the market regulators are eager to understand whether this regulatory change has improved the efficiency of the A- and B-share markets. The objective of this study aims to reexamine the issue of weak-form EMH of Chinese stock markets, and whether stock market efficiency has been improved after deregulation in the B-share markets of the Shanghai and Shenzhen stock exchanges. Numerous empirical studies have tested the weak-form EMH by using the variance ratio test of Lo and Mackinlay (1988) (hereafter, LOMAC). Although LOMAC (1989) and Liu and He (1991) asserted that the heteroskedasticity-robusted variance ratio is more powerful and efficient than the Box–Pierce or Dickey-Fuller test (1979), it fails to control the joint-test size and is associated with a large probability of Type-I error, as demonstrated by Chow and Denning (1993) (hereafter, CHODE). Recently, Wright (2000) developed the ranks and signs-based variance ratio tests, which involve no size distortions and distribution assumptions. These tests thus have superior testing power to the LOMAC variance ratio test. Consequently, this study combines the variance ratio test statistics, proposed by LOMAC (1988) and Wright (2000), with the multiple test procedure by CHODE as its empirical methodology.

The main contribution of this study is to investigate the weak-form EMH of Chinese stock markets and the influence of the regulatory change on market efficiency by applying more up-to-date methodologies to improve the robustness of the empirical results. Additionally, rolling variance ratio tests[1] are carried out to provide a dynamic inspection of the regulatory change on market efficiency. The results indicate that the A-share market of Shenzhen and B-share markets of both exchanges become efficient after the deregulation of B-share markets. It is worth to note that, as suggested by the rolling results, the market efficiency of Chinese stock market cannot be entirely explained by the influence of releasing investing restrictions on the B-share market. The remainder of this paper is organized as follows. Section 2 provides a brief introduction of Chinese stock market and literature review. Section 3 describes the econometric methodology. Data description and empirical results are then reported in Section 4. Finally, conclusions are presented in the last section.

2. A brief introduction of Chinese stock market and literature review

In the early 1990s, for the sake of attracting international capital inflows while mitigating adverse international impacts on Chinese stock market, the China government designed two segmented stock markets in both Shanghai and Shenzhen exchanges.[2] Each exchange trades two types of shares, known as A-shares and B-shares. A-shares are denominated in RMB (Renminbi, local Chinese currency), and can only be traded by individuals and legal persons in the People of Republic of China (PRC), which do not include residents of Hong Kong and Macau. B-shares traded in the Shanghai exchange are settled in U.S. dollars and those traded in the Shenzhen exchange are settled in Hong Kong dollars. The investors of B-shares are from Hong Kong, Macau, Taiwan, and other foreign countries.

On 19 February 2001, the China government announced to release investing restriction which allows domestic residents to trade in B-share markets. Lu, Wang, Chen, and Chong (2007) and Fifield and Jetty (2008) explored the effects of these regulatory policy changes on market efficiency. Lu et al. (2007)

[1] The technique of rolling variance ratio test is designed to accommodate the dynamic nature of the market and possible structural changes or influential outliers, and this method is also used to investigate the weak-form efficiency of stock indices by Tabak (2003), Belaire-Franch and Opong (2005b), Kim and Shamsuddin (2008) and Hung, Lee, and Pai (2009).

[2] Reader interested in Chinese stock exchanges, please refer to Zhang and Yu (1994) and Seddighi and Nian (2004) for a more detailed account.