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Full length article

How does crisis affect efficiency? An empirical study of East Asian markets

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Abstract

Much research has been undertaken in the Efficient Market Hypothesis (EMH) over the preceding two decades. With Asian countries emerging as a global powerhouse in terms of regional economics, the interest in their stock markets has picked up recently. Asian markets traditionally comprised of many emerging markets are generally assumed to be more volatile and speculative in nature. Based on this crux, we focus specifically on the response of these markets efficiency to major crisis. In recent years, the Asian markets have experienced a phenomenal boom in attracting foreign capital inflow, with Singapore evolving into a global financial hub in terms of banking and financial services. Scepticism and cautious nature raises the question of whether these stock markets are efficient enough for further investment and development. Our study is unique in nature, as we focus on the efficiency of these market in response to crisis periods, comparing it with their pre-crisis period, both in shorter term of 1 year as well as longer term of 5 years post and pre crisis period. Taking Malaysia, Indonesia, Singapore and South Korea owing to their economic and financial development, we use MF-DFA to derive efficiency measure for comparative analysis with its own past. The findings put forth a notion of generally a deteriorating and negative impact of the Asian financial crisis, while the sub-prime crisis impact varies based on the economic structure of the economies. The findings concur with the mainstream literature and similar studies for other countries and region.

JEL classification: C22; E44

Keywords: East Asian; Efficiency; Multifractal; Stock markets

1. Introduction

In the modern history, there have been two main economic cataclysms to the East Asian region. Firstly, the East Asian financial crisis of 1997, which began with the fall of the Thai baht, led to the downfall of several East Asian economies. Secondly, the global crisis of 2008, which caused stock markets to plummet and forced several economies into recession. It is interesting to note the difference between these two crises. While the Asian crisis had severely devastated economies, countries such as Indonesia, Korea, Thailand and Malaysia quickly bounced back post crisis. Park and Lee (2001) explain that owing to favourable fundamentals, the countries were able to recover swiftly. However, Stiglitz (2000) argues that the core of the 1997 crisis lies with financial and capital market liberalization without proper regulatory framework.

On the other hand, the global crisis, which was brought to East Asia through increased integration with major global financial centres owing to liberalization of capitals accounts and an increase in foreign investments, saw a greater interdependence between East Asian countries and other foreign markets.

The stock market plays a prominent role in the economic development of a country. Not only does it encourage savings and investments but also enhances corporate governance and

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social responsibility. A stock market, despite its relative riskiness as a mode of investment, provides great opportunities for local and global diversification through effective and efficient asset allocation (Samaratunga, 2008).

Discussing the impact crises have on stock markets, a key aspect that needs to be addressed, is the efficiency of the stock market. The case for efficiency arises with the liberalization of capital market prior to the crises. Retaining conventional neoclassical models, capital market liberalization should lead to markets that are more efficient. In particular, emerging markets post liberalization become more attractive to foreign investors for diversification purposes, and thus are able to increase liquidity and informational transparency leading to greater market efficiency. The premise of an efficient market lies in the Efficient Market Hypothesis (EMH) pioneered by Fama (1965). It statuses the concept of random walk in stock returns, as it allows us to formulate the rational expectation model and test the weak form market efficiency. This form of efficiency states that the current stock price is reflective of all information in the past prices (Arshad, Rizvi, Ghani, & Duasa, 2015).

Worthington and Higgs (2006) examined the weak-form efficiency of 10 emerging and 5 developed markets in Asia using serial correlation coefficient and runs tests and found no traces of random walk behaviour in the emerging market stocks (in China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Sri Lanka, Taiwan and Thailand), thus were marred with inefficiency. A similar study by Claessens, Dasgupta, and Glen (1995) tested for return anomalies and predictability using the Lo-MacKinlay statistic and several other statistical methodologies, found the stock markets of 20 emerging markets to be inefficient. Hoque, Kim, and Pyun (2007) examined the weak-form efficiency of eight emerging Asian stock markets for pre, post Asian crisis periods, employing two new variance ratio tests—Wright's rank and sign and Whang–Kim subsampling tests, as well the Lo–MacKinlay and Chow–Denning tests. They found no significant effect on the degree of efficiency. Six of the markets (Hong Kong, Indonesia, Malaysia, Philippines, Singapore and Thailand) remained inefficient even after the Asian crisis. On a similar note, Kim and Shamsuddin (2008), using multiple variance ratio tests based on the wild bootstrap and signs did not find a significant change in efficiency with the impact of the Asian financial crisis.

Based on the above studies, the crux of this paper is to examine the nature of East Asian stock markets pre- and post-crises, focussing on the efficiency aspect. We look at the impact the Asian Financial crisis of 1997 (July 1, 1997 to June 1, 1998) and the global crisis of 2008 (September 1, 2008 to May 1, 2009) has on the stock market's efficiency. Our study takes a sample of four countries, viz. Malaysia, Singapore, Indonesia and South Korea covering short-term (1 year) and long-term (5 year) periods before and after crisis. The segregation in one year and five year is to investigate on whether deviation in the stock markets efficiency is due to a temporary shock from the crisis, or a more fundamental shift in the efficiency level.

We select the countries based on their pecuniary development stage, market size and in particular exposure to both crises. Furthermore, they are selected owing to their position as tiger economies. Malaysia and Indonesia are part of the Tiger Club Economies, which follow the same model as the Four Asian Tigers, of which Singapore and South Korea are part. While other East Asian countries could be included, we focus on Malaysia, Indonesia, Singapore and South Korea owing to the direct impact of the Asian Financial crisis, making them significant in our study as opposed to other East Asian countries, which had a more indirect relationship. Thailand is not selected owing to significant data gaps, which would provide bias results. This study revolves around both the Asian financial crisis and the global crisis, hence the selection criteria were based on the significant involvement of East Asian markets for both crises.

The significance of selecting East Asia lies behind its nascent prominence in the global arena, noticeable by rapid expansions in trade and financial flows across borders. East Asia contributes towards 40% of the world's GDP growth. Much of this accelerated growth is attributed to significant emphasis on intra-industry trade, allowing for a FDI influx over the past several years, only affected during the various crisis periods, i.e. 1997 Asian crisis, 2000 dot com crisis, and the recent 2008 global crisis (Lipsey & Sjöholm, 2010). Furthermore, a global shift from west to east is being witnessed increasing the potential of emerging markets to develop and prosper. This inflow of substantial FDIs and the emerging nature of East Asian stock markets, which are more susceptible to volatility, beg the question of whether or not the stock markets are efficient.

Furthermore, leafing through literature on the Asian financial crisis it is clearly seen that the impact of the crisis on the efficiency of the stock market has received very little attention (see Lim, Brooks, & Kim, 2008; Cheong, Nor, & Isa, 2007 and Kim & Shamsuddin, 2008). This study contributes to existing literature by firstly, examining the impact of the crisis on the stock markets, through its efficiency. Secondly, we employ a relatively recent methodology in econophysics, the Multifractal Detrended Fluctuation Analysis (MF-DFA) to rank the efficiency of the stock markets. Thirdly, as discussed by Antoniou, Ergul, and Holmes (1997) it is necessary to examine efficiency at different stages of development to reflect changes in market regulations, hence, we examine the efficiency at post- and pre-stages of both crises.

The traditional approach to arguing for weak-form efficiency is return independence, often measured by correlation (see Allen, Otchere, Senbet, 2011). However, this is mainly suitable for developed securities markets, which assume that the prices are not exposed to substantial upward trends and are more liquid. More appropriate approaches include the unit-root analysis (Annuar & Shamsher, 1993), probability distribution functions (Gabaix, Gopikrishnan, Plerou, & Stanley, 2003; Lee & Lee, 2007), correlation functions (Podobonik, Grosse, & Stanley, 2002), and network analysis (Jeong, Tombor, Albert, Oltvai, & Barabási, 2000). In the case of detecting whether evolving markets are weak-form efficient, a