Pacific-Basin Finance Journal 17 (2009) 444–459

Contents lists available at ScienceDirect

Pacific-Basin Finance Journal

www.elsevier.com/locate/pacfin

Stock index reaction to large price changes: Evidence from major Asian stock indexes

Khelifa Mazouz [a], Nathan Lael Joseph [b,*], Clement Palliere [b]

[a] Bradford University School of Management, Bradford, BD9 4JL, United Kingdom
[b] Aston Business School, Aston University, Aston Triangle Birmingham B4 7ET, United Kingdom

ARTICLE INFO

Article history:
Received 10 July 2007
Accepted 9 November 2008
Available online 17 November 2008

JEL classification:
G1

Keywords:
Market efficiency
Overreaction
Return continuations
Uncertainty information hypothesis
Heteroscedasticity

ABSTRACT

We examine the short-term price behavior of ten Asian stock market indexes following large price changes or “shocks”. Under the standard OLS regression, there is stronger support for return continuations particularly following positive and negative price shocks of less than 10% in absolute size. The results under the GJR-GARCH method provide stronger support for market efficiency, especially for large price shocks. For example, for the Hong Kong stock index, negative shocks of less than −5% but more than −10% generate a significant one day cumulative abnormal return (CAR) of −0.754% under the OLS method, but an insignificant CAR of 0.022% under the GJR-GARCH. We find no support for the uncertainty information hypothesis. Furthermore, the CARs following the period after the Asian financial crisis adjust more quickly to price shocks.

1. Introduction

Several empirical studies on short-term price changes or “shocks” show that investors overreact to the arrival of new information about stock prices. Specifically, Bremer and Sweeney (1991) find that large negative price changes give rise to overreaction in U.S. stocks. This price behavior is not consistent with the efficient market hypothesis (EMH). Bowman and Iversion (1998) also find support for the overreaction hypothesis following large weekly price changes in New Zealand stocks, whilst Ferri and Chung-Ki (1996) observe a similar pattern following large one day price changes in the S&P500 index. Cox and Peterson (1994) also find support for the overreaction hypothesis in U.S. stocks. However, most of the price reversals disappear after accounting for the bid-ask bounce. Similarly, Atkins and Dyl (1990) find overreaction in U.S. daily stock prices but they conclude in favor of market efficiency after accounting for the bid-ask spread and market liquidity. In contrast, Park (1995) finds support for overreaction in U.S. stocks and shows that the

* Corresponding author. Tel.: +44 121 204 3143; fax: +44 121 333 5708.
E-mail address: n.l.joseph@aston.ac.uk (N.L. Joseph).

0927-538X/$ – see front matter
doi:10.1016/j.pacfin.2008.11.001

price reversals are not fully explained by the bid-ask bounce (see also, Bremer et al., 1997). Recently, Lasfer et al. (2003) find support for return continuations in stock price indexes which they attribute to momentum behavior in returns. If short-term return continuations are due to investor biases, these biases should give rise to a price drift as information uncertainty increases (see, Zhang, 2006).

Brown et al. (1988) argue that their uncertain information hypothesis (UIH), provides a richer description of short-term price behavior. Under the UIH, the arrival of new market-wide information has two simultaneous effects on a security's price: i) it makes the stock price adjust to the content of impending news; and, ii) it creates a transitory systematic risk component.[1] The transitory risk component accounts for the condition that investors often set prices before the full ramification of new and impending information is known. Since risk-averse investors require a higher return for a higher level of risk, the asset's price following the arrival of new information will be lower than its expected value, given the perceived risk associated with the new event. The UIH further predicts that after adjusting for the risk element of the news, the abnormal return (AR) will be zero in line with the EMH. An important advantage of the UIH is that it provides a direct test of the behavior of both risk and expected return around large price changes, unlike other approaches.

Brown et al. (1988) find support for the UIH in the U.S. stock market. Specifically, they find that both post-event average returns and volatility increase after the arrival of positive and negative unexpected news. Schnusenberg and Madura (2001) also find support for the UIH, although they are not specifically concerned with large price shocks. Using the symmetric generalized autoregressive conditional heteroscedastic (GARCH) estimation method, Ajayi et al. (2006) also find support for the UIH in U.S. stock indexes.[2]

Overall, prior empirical studies do not provide conclusive evidence as to whether overreaction, underreaction, market efficiency, or uncertainty information best explains short-term price behavior.[3] This weakness of prior studies may be partly due to their research designs. For example, we show later that the magnitude of the price shock is an important factor contributing to differences in the results obtained. We also find that the choice of the estimation method leads to differences in the results.[4]

This empirical study examines the short-term price behavior of ten Asian stock market indexes following large price shocks.[5] We are specifically interested in the unexpected price impacts of positive and negative shocks under uncertainty.[6] Most prior studies on short-term price behavior employ the standard OLS method to estimate the ARs. To provide a comparison with prior studies, we estimate the ARs using the standard OLS. However, to avoid the econometric problems associated with the standard OLS estimation method, we also estimate the ARs using the: i) symmetric GARCH, and ii) Glosten et al. (1993) threshold (asymmetric) GARCH, hereafter GJR-GARCH, estimation methods. Both the symmetric GARCH and the GJR-GARCH estimation methods allow us to capture the conditional volatility in returns.

There are several important aspects of our research design that deserve consideration. Firstly, Savickas (2003) shows that the use of the symmetric GARCH method to capture heteroscedasticity around event and non-event dates leads to substantially higher rejection rates of the false null hypothesis compared to previous approaches. Whilst the symmetric GARCH seeks to capture the effects of conditional volatility on the returns, the GJR-GARCH method seeks to capture both conditional volatility and asymmetry in returns. That is, in addition to the conditional volatility, the GJR-GARCH also controls for the likelihood that negative shocks have a larger impact on returns compared to positive shocks. The use of GARCH-based estimation methods also leads to greater estimation efficiency compared to the standard OLS method. If the variance of

[1] The UIH builds on earlier empirical work that shows that the volatility of stock returns increases around regularly scheduled firm-specific announcements (see, e.g., Kalay and Lowenstein, 1985).

[2] Ajayi et al. (2006) claim that their results are not sensitive to the type of GARCH model used.

[3] To see this, we provide a summary of the main findings in Appendix A.

[4] Most empirical studies employ the standard OLS estimation method (see e.g., Atkins and Dyl, 1990; Lasfer et al., 2003) despite its restrictive assumptions. In our study, we estimate the ARs using OLS and GARCH-based estimation methods.

[5] Our study therefore differs from those studies concerned with both long-term (medium-term) price overreaction (momentum) associated with De Bondt and Thaler (1985) and Jegadeesh and Titman (1993), for example. Such studies are not concerned with price shocks and their methodological approach focuses mainly on portfolio rankings.

[6] The events are considered to be unexpected since they are not necessarily centered around regularly scheduled financial and economic announcements. This does not mean that some expected events may not have been included in our analysis. The problem here is that we cannot practically observe all expected events for the stock indexes used in our study.