



Do the prices of stock index futures in Asia overreact to U.S. market returns?

Alexander Kwok-Wah Fung^{*}, Kin Lam¹, Ka-Ming Lam²

Department of Finance and Decision Sciences, Hong Kong Baptist University, Kowloon Tong, Hong Kong

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ABSTRACT

We extend the overreaction study to interaction of international markets and find that intraday price reversals exist in Asian index futures markets following extreme movement in U.S. market. Profitable opportunities exist after considering transaction cost. We show that the reversal cannot be explained by rational arguments such as risk, liquidity and bid-ask spread. We further observe that a magnitude effect exists. Overreaction is more prominent in the latter period than in the initial period. After calm-down periods, overreaction is greatly reduced. These observations support the explanation that the source of price reversals lies in behavioral biases.

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1. Introduction

This study examines the extent to which investors in the Asian markets have actually overreacted in determining the opening prices of index futures contracts. Specifically, we investigate Asian markets' response following a large rise/drop in the U.S. market. Our motivation for the paper is other studies in overreaction and studies on the structure of interdependence in international stock markets. Our work is similar to [Engle et al. \(1990\)](#) in that we all investigate the effects of U.S. on Asian markets and find that the relationship exists. However, while they look at the volatility spillover of foreign exchange markets in Tokyo and New York, we look at the overreaction of Asian index futures markets to price movement in U.S. Moreover, we show that there is a magnitude effect in such overreaction. [Bessler and Yang \(2003\)](#) use an error correction model to investigate the interdependence of international stock markets. They find out that the U.S. market is the only market that has a consistently strong impact on price movements in other major stock markets. [Eun and Shim \(1989\)](#) demonstrate that the U.S. market leads other world markets. These findings motivate us to investigate the reaction of Asian index futures markets to the U.S. stock market performance. Well known to practitioners and finance researchers, Asian markets that open after the U.S. markets close are expected to follow the U.S. trend. According to the efficient market hypothesis, since the most recent performance of the U.S. market is a piece of public information easily assessable to Asian investors, the price discovery process at market open should

^{*} Corresponding author. Tel.: +852 34115225; fax: +852 34115585.

E-mail addresses: afung@hkbu.edu.hk (A.K.-W. Fung), lamkin@hkbu.edu.hk (K. Lam), kaming.lam@gmail.com (K.-M. Lam).

¹ Tel.: +852 34117556; fax: +852 34115585.

² Tel.: +852 34115342; fax: +852 34115585.

not cause any systematic reversals after market open. Thus, it is of theoretical interest to investigate such a possible reversal under an international setting.

2. Reversals, overreaction, and psychology

Our findings confirm that there is a price reversal in Asian index futures markets following extreme movements in the U.S. market. It is well accepted that investors' overreaction will lead to subsequent price reversal. But it becomes controversial to link reversal to investors' overreaction. For studies in which the triggering event of investors' reaction is not identified, this linkage becomes even less certain. In [Section 2.1](#), we discuss whether reversal is linked to investors' overreaction. We then discuss in [Section 2.2](#) whether the reversal is linked to investors' psychological biases.

2.1. Is reversal linked to investors' overreaction?

In the present study, we choose to investigate the effect of U.S. price swings on Asian market performance for the following reasons. (1) To an Asian market, the U.S. market performance is basically an exogenous event. Hence, it simplifies the establishment of a linkage between price reversals and overreaction. (2) Compared to other exogenous events, the one we choose is very precise in its content and time of arrival to the market. The intensity of the event can also be measured accurately. This enables us to test the second part of the overreaction hypothesis which states that the more extreme the event is, the larger the overreaction is. (3) The performance of the U.S. market is widely known to the investment public in Asia. Even individual investors can obtain this information from the local morning news on a timely basis with no cost. Hence, overreaction caused by this exogenous event is less likely to be caused by differential information sets among investors. (4) The exogenous event happens regularly on a daily basis. Since our study spans a period of five or more years, we have plenty of observations, and the time trend of overreaction, if any, can be studied. Moreover, the triggering events occur almost every trading day. If investors are rational, they should learn from it and correct their mistakes very soon. The fact that overreaction exists for a long period of time, especially in the latter period, shows that investors may have difficulty in controlling their reactions caused by emotion. (5) We choose to study the exogenous event's impact on futures prices rather than on cash prices because the futures prices are known to lead cash prices. Also, since transaction cost is much lower in a futures market, any price reversals can easily be exploited by a suitable trading strategy. Thus, if such reversals consistently occur for a number of years, it can hardly be explained by market efficiency theory.

2.2. Overreaction and investors' psychology

Even though we confirm that investors have overreacted, it is still not clear whether such overreaction is attributable to investors' psychology. As pointed out by [Brav and Heaton \(2002\)](#), the anomaly can be explained by either investors' irrational behavior or investors' rational behavior incorporating their uncertainty about regime changes. See also [Lewellen \(2002\)](#), [Lewellen and Shanken \(2002\)](#) and [Gervais and Odean \(2001\)](#).

The unique international setting in this study enables us to carry out further investigation to see whether the phenomenon we observe here is indeed due to investors' psychology. According to the efficient market hypothesis, the free flow of information (in terms of availability, cost and speed) is important in the determination of a fair price (see [Fama, 1970](#)). In the case of index futures markets, the Asian markets are relatively young. As time goes by, Asian markets mature and are more integrated into the world market. Investors' information on U.S. market performance should become more widespread as time goes on. As a result, one may suspect that any "abnormal" market phenomenon should diminish or even disappear as these markets become more mature. However, we find that the overreaction in the period 2000 to 2003 is much stronger than that found in previous years. It seems that more market integration and information flow actually induce more overreaction in the case under our investigation. We call this "market maturity effect". There is a behavioral explanation for such finding. When investors get access to more information, it increases their confidence (and over-confidence). [Oskamp \(1965\)](#) first documents this phenomenon in psychologists' decision in clinical trials. Their confidence increases with knowledge but the accuracy does not. In a similar study in financial settings, [Barber and Odean \(2002\)](#) find that investors who switch to online trading from phone-based trading trade more and earn lower returns. They attribute this to investors' over-confidence due to self-attribution bias and the illusions of knowledge and control. Investors may overreact more when information flow is more widespread.

[Slovic \(1999\)](#) claims that the public's judgments about risk are influenced by emotion and he further claims that this is true even for scientists. Hence, it is reasonable to suspect that the above reversals may be caused by investors' emotion. If that is the case, calming down investors' emotion may reduce this error of judgment. In counseling psychology, it is well known that Bowenian approach is widely practiced in family therapy to deal with chronic anxiety and emotion. Basically, patients are brought to a psychologically safe environment to calm down and to reflect on themselves (see [Becvar and Becvar \(2003\)](#) for more detailed discussion), which is known to have the effect of reducing emotional disturbance. If investors' overreaction is attributed to investors' emotional imbalance, a longer period of time for investors to calm down may reduce investors' bias. On regular days (non-Mondays), Asian markets open a few hours after the U.S. market closes. However, on Mondays, there is a two-day's break after the U.S. market closes. If calm-down effect exists, investors' overreaction on Mondays may not be as wild as that on other days since they have the weekend to settle down their emotion. We group all Mondays into a group called "calm-down days". We find that investors' behavior on calm-down days is significantly different from that on regular days. Although overreaction exists in all markets on regular days, overreaction is not observed at all on calm-down days in all the Asian markets we examined, except in

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