



Continuing overreaction and momentum in a market with price limits[☆]

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ARTICLE INFO

JEL classification:

G11
G12
G14

Keywords:

Continuing overreaction
Momentum
Price limits
Taiwan stock market

ABSTRACT

In this paper, we document strong return predictability for continuing overreaction in Taiwan, a market without the existence of momentum for conventional momentum strategies. Using signed volume to proxy for the level of continuing overreaction, we show that the strategy that buys stocks with upward continuing overreaction and short sells those with downward continuing overreaction generates both intermediate-term continuations and long-term reversals in this market. The evidence is consistent with the prediction of the model based on investor overconfidence and biased self-attribution in predicting future stock returns. We further examine the impact of price limits on this overreaction-based return predictability by isolating the information embedded in signed volumes for limit-hit and non-hit days, respectively. The findings indicate that the imposition of price limits seems to restrain investors' overreaction behavior and that trading volume in non-hit days is a cleaner measure to capture the level of investor overconfidence in generating intermediate-term continuations and long-term reversals.

1. Introduction

Behavioral theories propose that intermediate-term momentum in stock markets is induced because of investors' irrational reaction to information. Among the vast literature, investor overconfidence is one leading explanation of momentum. This line of research is initiated by Daniel et al., 1998, who propose a theoretical model of investor overconfidence and biased self-attribution to explain both under- and overreactions in stock markets. Follow-up studies provide several measures and empirical tests to demonstrate evidence in support of the DHS model. In particular, Hou et al. (2009) argue that contemporaneous with up markets, investor overconfidence can give rise to excess trading volume. Thus the overreaction-driven momentum is more pronounced among stocks with high volume and following up markets. Asem and Tian (2010) propose that investor overconfidence is strengthened when the market continues in the same direction. Confirming the prediction of the DHS model, they show that market continuations enhance momentum profits while market transitions decrease the profitability of momentum.

Byun et al. (2016) indicate that an important implication of the DHS model is that the formative process of investors' overconfidence is related to their behavior of continuing overreaction. In the DHS model, overconfident investors initially overreact to their private information; their confidence is enhanced upon subsequent arrivals of public signals due to biased self-attribution and leads to further overreaction to the information. They thus propose a direct measure of continuing overreaction using weighted signed volumes to verify the credibility of the DHS model in explaining momentum profits. In particular, they construct a trading

[☆] Kuan-Cheng Ko acknowledges the financial support from the Ministry of Science and Technology of Taiwan (grant number: MOST 104-2410-H-260-004-MY2).

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strategy by buying stocks with large positive continuing overreaction and short selling those with large negative continuing overreaction and show that the proposed strategy generates significant abnormal returns. Further, despite its usefulness in the U.S. market, continuing overreaction has no return predictability in Japan, a market whose participants have been documented to lack biased self-attribution (Kitayama et al., 1995).

The sharp difference in the continuing overreaction-based predictability between the U.S. and Japan markets motivate us to examine the effectiveness of Byun et al.'s (2016) strategy outside the U.S. market. In particular, we extend Byun et al.'s (2016) research by investigating whether continuing overreaction is a useful predictor of future returns in the Taiwan stock market. We choose this particular market for two reasons. First, unlike Japanese investors that are generally viewed as conservative and collectivistic, investors in Taiwan have been documented to exhibit overconfident trading behavior. Barber et al. (2009) show that individual investors in Taiwan account for over 90% of the trading volume with an annual turnover rate of 300% to 600% and attribute such active trading behavior to investor overconfidence. Lin et al. (2016) provide supportive evidence for the overconfidence hypothesis by showing that the traditional price momentum is profitable during periods of market continuations but not periods of market transitions. Taking the two advantages together, the Taiwan stock market serves as a natural experimental environment to examine the usefulness of continuing overreaction in explaining momentum considering the impacts of price limits.

Second, the lack of momentum in the Taiwan stock market is a long-debate phenomenon in the literature. Hameed and Kusunadi (2002), Chui et al. (2003, 2010) and Du et al. (2009) all indicate that the standard momentum strategy of Jegadeesh and Titman (1993) fails to be profitable in this market. But little is known about the underlying reason of the absence of the momentum effect in Taiwan. Analyzing the profitability of the momentum strategy based on continuing overreaction enables us to revisit the momentum effect in Taiwan, and more specifically, to examine whether investor overconfidence could be a possible source to induce return continuation in this market.

We first confirm the effectiveness of the standard continuing overreaction measure in predicting future stock returns in Taiwan and find that its effectiveness persists up to 9 months after portfolio formation. This continuing overreaction-oriented momentum strategy is subject to strong reversals in January months, thus its profitability is more pronounced in non-January months. We further confirm that this strategy exhibits reversals starting from the second year after the portfolio formation, thus supporting the notion that profitability of the continuing overreaction-oriented momentum is better explained by the DHS model.

We also verify in cross-sectional regressions that the impact of continuing overreaction in inducing subsequent return continuation is robust to the inclusion of several determinants of momentum and stocks returns. In particular, the impact of continuing overreaction remains strong when we control for return consistency of Grinblatt and Moskowitz (2004) and information discreteness of Da et al. (2014), measures that are used to capture the return patterns over the formation periods. The profitability of continuing overreaction is also unaffected by small firm, idiosyncratic volatility, illiquidity, and turnover effects. After we eliminate the information embedded in these variables, the residual continuing overreaction still remains a strong predictor of future stock returns.

Our results are important to the momentum literature, with especial insight into the understanding of the overreaction-bases return predictability. Motivated by the psychological nature of investors' overconfidence and self-attribution bias, Chui et al. (2010) show that individualistic countries generate more significant momentum profits than collectivistic countries. The Taiwan market, with an individualism score of 17, is generally viewed as highly collectivistic around the world.¹ If investors in collectivistic cultures exhibit less overconfident trading behavior, then why could the continuing overreaction-based strategy useful in the Taiwan stock market?

We propose that despite the cultural divergence, the difference on trading mechanism between the U.S. and Taiwan markets might be an interesting issue to explore. Unlike the U.S. market that imposes trading halts in extreme conditions, the Taiwan Stock Exchange (TWSE) imposes price limits for individual stocks. This issue is important because when investors are overconfident about their own information, their trading is more likely to trigger price limit events. As trading is allowed at the limit price but not beyond whenever the stock price hits the upper or lower boundary, trading volume will be limited at price limits even the magnitude of investor overconfidence is high. In such condition, the signed volume at price limit events would be underweighted in Byun et al.'s (2016) continuing overreaction measure.

Another important observation regarding the differences in trading mechanism around the world is that the majority of collectivistic countries impose price limits while individualistic countries mostly do not. We plot the relation between the imposition of price limits and individualism score across countries in Fig. 1. In particular, among the 20 countries with individualism scores higher than 50, only 7 of them impose price limits. As a comparison, 15 out of the 19 countries with individualism scores lower than 50 impose price limits. It is obvious that Chui et al.'s (2010) individualism-based explanation for momentum profits is concentrated in countries without the imposition of price limits. But whether and how price limits affect the momentum effect, especially when it is induced by investor overconfidence, has yet been investigated in the literature.

We thus examine the impact of price limits on continuing overreaction in explaining future stock returns by discriminating signed volumes of non-hit days from those of limit-hit days. We develop two continuing overreaction measures using data on non-hit and limit-hit signed volumes and construct momentum strategies based on the two measures, respectively. We find that the intermediate-term momentum and long-term reversal is pronounced only in the non-hit continuing overreaction strategy. The strategy constructed based on limit-hit continuing overreaction, however, generates negative but insignificant profits in both intermediate and long terms.

Our overall findings have two important implications. First, despite the fact that Taiwan is a relatively collectivistic market, Byun et al.'s (2016) continuing overreaction measure is still effective in capturing investors' relative magnitude of overreaction in trading

¹ As a comparison, the U.S. culture has an individualism score of 91, while Taiwan is ranked as the 39th out of the 41 countries examined in Chui et al. (2010).

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