



The role of information uncertainty in moving-average technical analysis: A study of individual stock-option issuance in Taiwan



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ABSTRACT

Using a sample of Taiwan stock market, this paper investigates the role of information uncertainty in the profitability of technical analysis by applying a moving average (MA) strategy to portfolios grouped according to whether firms issue stock options. Results indicate that, even though considering transaction costs, the MA strategy significantly outperforms the buy-and-hold strategy on the portfolio without option issuance, but not on the portfolio with option issuance. The results support the hypothesis that stocks that do not issue options exhibit greater information uncertainty, and thus greater price continuation, which in turn implies a superior performance of the MA strategy.

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1. Introduction

A moving-average (MA) technical analysis is commonly used in practice as an indicator to generate buy/sell signals from past prices to predict future market movements. Although some academic researchers have provided unfavorable evidence¹, most of the recent literature has found results that favor the persistent profitability of the MA trading rule (e.g., Marshall et al. 2008; Zhu and Zhou, 2009; Han et al. 2013; Zhou and Zhu, 2014; and Han et al. 2016). Based on an asset allocation perspective, Zhu and Zhou (2009), for example, propose a theoretical equilibrium model and calibrate the model from real data, S&P500, to demonstrate the usefulness of the MA strategy. Han et al. (2013) apply the MA strategy to portfolios sorted by the level of information uncertainty (IU) and conclude that the MA strategy substantially outperforms the buy-and-hold strategy, especially when it comes to high-IU portfolios. Han et al. (2016) suggest that a trend-based technical signal is likely more profitable for the high information-uncertain stocks because the highly uncertain information about stocks would reduce the imprecision of fundamental signals and lead investors to rely more heavily on technical signals.

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¹ For example, Fong and Yong (2005) apply over 800 moving-average rules to Internet stocks and find no evidence of significant trading profit. Bajgrowicz and Scaillet (2012) document that the profitability of technical trading rules seems not to be persistent and is completely offset by transaction costs.

Expanding upon Han et al. (2013), Zhou and Zhu (2014), and Han et al. (2016), who conjecture that price continuation differentials between high-IU and low-IU stocks arising from differing under-reactions to public information by investors, which are important when it comes to assessing the value of the MA signal, this paper tests the profitability of using MA strategies for portfolios grouped according to whether stocks issue individual stock options (calls and puts) for the Taiwan stock market.²

The literature suggests that a substantial amount of informed trading takes place in the option market due to greater leverage and lower trading costs, and thus certain stock option trades include information about future stock price movements. For example, using Hasbrouck's (1995) information share methodology, Chakravarty et al. (2004) suggest that stock option trading contributes to price discovery in the underlying stock market. Pan and Poteshman (2006) examine the informational content of option trading and conclude that put/call ratios of option volumes significantly predict the cross-sectional stock return. Roll et al. (2009) suggest that options trading volumes have a positive effect on firm value by allowing agents to cover more contingencies and by stimulating more privately informed trading. Cremers and Weinbaum (2010) use the difference in implied volatility between pairs of call and put options as a predictor to show that deviations from put-call parity contain information about future stock prices. Phillips (2011) documented that options introduction provides an effective substitute to short-sales and thus contributes to improved informational efficiency. Consistent with rational models of informed trading, An et al. (2014) document that stocks with large past innovations in call (put) options imply volatilities have high (low) future stock returns.

Building upon these studies, it is expected that individual stocks *without* options traded on might have a higher level of IU than those *with* options traded on. Using a sample of stocks listed on the Taiwan Stock Exchange during 2003–2013, our preliminary results support this expectation. We find that trading volume of underlying stocks increases obviously after their option issuances.³ Also, Compared with stocks with options issuance, stocks without options issuance exhibit characteristics related to higher IU: smaller size, higher volatility, lower institutional ownership, and higher R&D density.

Further, the behavioral finance literature provides strong evidence for stock price continuation, which can often be attributed to investor under-reactions to public information contained in past returns and earnings news (e.g., Chan et al. 1996; Hong and Stein, 1999; Hirshleifer, 2001; and Daniel et al. 1998, 2001; Moskowitz et al. 2012). Motivated by this literature, researchers further document that greater IU exacerbates investor under-reaction behavior and thus promotes price drift (e.g., Jiang et al. 2005; Zhang, 2006; Francis et al. 2007; and Hou et al. 2014). As the MA strategy is trend following, it is expected to be more profitable in high-IU stocks in which there is a longer price continuation (Han et al., 2013; and Zhou and Zhu, 2014).

This study brings together these two strands of the literature and tests the central hypothesis: *individual stocks that do not issue options exhibit greater information uncertainty and thus greater price continuation, which in turn implies a superior performance of the MA strategy on them*. By following Han et al. (2013), we apply a 10-day MA strategy to two portfolios grouped according to whether individual stocks issue options based on a sample of TWSE-listed stocks during 2003–2013, and provide three main results to support our central hypothesis.⁴ First, the MA timing strategy significantly outperforms the buy-and-hold strategy in portfolios without options issuance, but do not do so in portfolios with options issuance. Second, the superior performance of the MA strategy relative to the buy-and-hold strategy remains when considering transaction costs (see, e.g., Bajgrowicz and Scaillet, 2012), using 20-, 50-, 100-, and 200-day MA strategies as trading rules (see, e.g., Brock et al., 1992), and controlling for business-cycle regimes (see, e.g., Henkel et al., 2011; Kim et al., 2011; Han et al., 2013; Neely et al., 2014; Taylor, 2014). Finally, in the calculation of transaction costs, the capital asset pricing model (CAPM) and the Fama-French (1993) risk-adjusted returns generated by the 10-day MA strategy relative to the buy-and-hold strategy in portfolios without options issuance are about 20–25% annually.

This paper makes two major contributions to the literature. First, although many studies have suggested that technical trading rules are quite successful in the Taiwan stock market (e.g., Bessembinder and Chan, 1995; Ito, 1999; and Ratner and Leal, 1999; and Fang, 2014), no previous study has provided evidence of the effect of information uncertainty on the profitability of using the MA strategy for this market. The results of this study fill this gap. Second, to the best of our knowledge, this is the first study to examine the profitability of MA's on high- and low-IU portfolios classified by stock option issuances. Therefore, this study enhances our understanding of the informational role of options in affecting the MA's profitability in underlying stocks.

The remainder of this paper is organized as follows. Data collection and methodology are provided in Section 2. In Section 3, we provide the main empirical results. Section 4 demonstrates some robustness analyses. Section 5 concludes the paper.

² Harvey (1995) suggests that the level of serial correlation in stock prices in emerging markets such as Taiwan is particularly higher than that in developed markets, which manifests the importance of studying the profitability of the trend-following MA strategies in this market.

³ Previous literature has well-documented that security trading volume is related to the flow and the nature of the information (e.g., He and Wang, 1995; and Chae, 2005).

⁴ The advantage of applying the MA strategy to portfolios instead of to market indices is that a portfolio-based analysis provides an opportunity to examine the cross-sectional profitability of the MA strategy relative to the buy-and-hold strategy of the high-IU versus low-IU portfolios.

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