



The predictability of opening returns for the returns of the trading day: Evidence from Taiwan futures market

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ABSTRACT

This study provides evidence for the predictive power of the open-period returns for the returns of the rest of the trading day. Using the first two consecutive 5-minute periods after the opening as observation points from which to determine the trading direction, this study examines whether the effect of open-period intraday cumulative index futures returns can persist toward the close of the market. The strategy is tested using intraday data of Taiwan Stock Index Futures (TX) over the 2001–2006 period. The results consistently show that the opening return can predict the return of the trading day and the trading strategy based on the opening return is profitable even after considering transaction costs. The results are robust to uses of different index futures.

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1. Introduction

Recent decades have seen increased attention being given to the predictability of stock prices based on information contained in past returns. For example, Jegadeesh and Titman (1993a, 1993b) first document that a zero-investment strategy of buying past winners and selling past losers can bring significant gains. Rouwenhorst (1998) and Griffin, Ji, and Martin (2003) also find evidence of momentum in international markets. However, most literature on momentum focuses exclusively on low frequency data and stock markets and does not consider high frequency (intraday) data and futures markets.¹ The aim of the paper is thus to contribute to the existing literature on intraday return predictability in the futures market.

While much research has recently been devoted to dealing with intraday intervals instead of daily intervals using US or international market data, previous studies provide scant evidence for the predictability of intraday returns in stock and futures markets. For instance, Table 1 of Chakrabarty and Trzcinka (2006) lists momentum related studies, sample period, and the exchange listing of the sample firms. Almost all of these studies use the Center for Research in Security Prices (CRSP) data, although two papers also use the Trade and Quote (TAQ) dataset to investigate the effect of trading costs or price impact on the profitability of particular momentum strategies without testing whether intraday momentum exists.² In the same vein, Chakrabarty and Trzcinka (2006) find significant discrepancies between the CRSP and TAQ databases, because momentum portfolios constructed from CRSP prices gain, whereas similar portfolios using TAQ prices lose. Hvidkjaer (2006) also uses intraday transaction data for all NYSE/AMEX stocks to

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¹ Jegadeesh and Titman (1993a, 1993b), Chan, Jegadeesh, and Lakonishok (1996), Rouwenhorst (1998), Griffin et al. (2003), George and Hwang (2004), Korajczyk and Sadka (2004), Figelman (2007), and Arena, Haggard, and Yan (2008) are just a few.

² These two papers are Korajczyk and Sadka (2004) and Chen, Stanzl, and Watanabe (2004).

analyze trade imbalances in a momentum portfolio. Still, little research is available on the predictability of intraday returns, and this is a gap that this study aims to fill.

In considering the issue of predictability, the first question is whether there is an intraday return pattern that is useful for predicting future returns. Wood, McInish, and Ord (1985) first document an intraday U-shaped return pattern that average returns tend to be higher at the beginning of the trading day, especially in the first 30 minutes, and then higher again at the end of the trading day. Their results provide clear evidence that the stock return generating process varies systematically across the trading day. A number of studies have tried to explain this intraday return pattern.

Moreover, a growing body of literature is available on the intraday return patterns in the stock and futures markets. For instance, Andersen and Bollerslev (1997) provide evidence that intraday returns exhibit strong seasonal patterns and pronounced heteroskedasticity, though the autocorrelation of intraday price returns seems to vary over time and change signs under different conditions.³ Recently, Heston, Korajczyk, and Sadka (2009) find a striking pattern of return continuation at half-hour intervals on the NYSE that are exact multiples of a trading day, and that this effect lasts for at least 40 trading days. Their finding shows that intraday returns are predictable.

These findings about intraday return patterns raise the question of what the economic importance of such systematic movements in average returns could be. For example, the higher open-period intraday returns would suggest that if investors want to short sell without incurring immediate losses, they should refrain from selling until, say, the first 30 minutes. Also, the presence of the U-shaped return pattern implies that it may be profitable to buy at the first minute of the day and selling at the thirtieth. On the other hand, it is unclear whether this strategy is still profitable when the commissions and other transaction costs are taken into account.

Unfortunately, very little is known about whether investors can take advantage of systematic intraday return patterns, such as open-period returns. For example, Grant, Wolf, and Yu (2005) find intraday price reversals following large price changes at the market open in the US stock index futures market over a period from November 1987 to September 2002. On the face of it, traders can use this finding to devise a contrarian trading strategy, by which traders close their positions soon after observing large price change at the market open. However, these results do not support a successful contrarian trading strategy after considering transaction costs. While there are some patterns of intraday returns, investors are more interested in how to distinguish related patterns and how to profit or hedge risk from different conditions. For example, day or position traders may hope that the cumulative effect of the open-period returns can at least last near the market close, and it seems naïve to expect that the level of persistence in intraday price returns remains constant. However, this is not an either-or situation. The persistence of intraday price returns may be significant only at the start and the end of the trading day, but insignificant during the rest of the day. In order to reduce transaction costs and make good use of the two-sided persistence, traders may have to enter a position in the open-period and close the position near the close of trading.

The objective of this paper is to examine the predictive power of the open-period returns for the returns of the trading day. Along this line, I investigate whether the effect of open-period index returns can persist over time. I use the first two consecutive 5-minute periods after the market opening as observation points from which to set the trading strategy. The strategy involves analyzing the index returns from the first two 5-minute trading intervals in Taiwan's cash stock market, taking a (long or short) position on the Taiwan Stock Index Futures (TX), and then closing out the position during the closing period of the trading session. My study sheds light on whether traders can generate abnormal profits by forming a trading strategy from the open-period price information.

To facilitate profitability analysis, I use a trading strategy without maintaining positions overnight. This is because, for most day traders, not investing until near the end of the trading day or maintaining positions overnight may incur substantial unexpected liquidity or price risks. Some political factors, for instance, can cause a dramatic move in the stock market, resulting in large, unexpected losses. In addition, many investors dislike rolling forward to maintain positions or think that the leverage associated with a futures contract is already high enough. Hence, this study focuses on a day-trading strategy for stock index futures.⁴

The trading strategy is tested using Taiwan Stock Index Futures (TX) intraday data from January 2001 to December 2006. Empirical results consistently show that the open-period return strategy is profitable, even when transaction costs are considered. In addition, robustness checks show that this strategy yields an abnormal profit even when using different index futures contracts. These findings suggest that open-period cumulative returns contain valuable information for predicting future returns over the day.

The remainder of this article is organized as follows. Section 2 describes the institutional background for the Taiwan securities trading system. Section 3 outlines the data and methodology. Section 4 presents empirical results and robustness checks, while Section 5 discusses the empirical results. Finally, Section 6 concludes the paper with the implications of the results and some suggestions for future research.

³ Cotter and Dowd (2010) also find evidence on the seasonality of transaction limit and market orders in the DEM/USD foreign exchange market.

⁴ However, this strategy can be easily revised by using another exit rule with maintaining positions overnight or holding the positions for a period of time, or holding the positions until the opposite buy/sell signal appears.

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