



Extended trading in Chinese index markets: Informed or uninformed?



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ABSTRACT

The extension of trading hours for HS 300 index futures (China Shanghai Shenzhen 300 Stock Index Futures or Hushen 300 Index) in China provides an opportunity for examining whether extended futures trading has significant price discovery in exchange-traded fund (ETF) returns during regular trading hours. We find that pre-open and post-close futures trades significantly influence ETF returns. Extended futures trades contribute to price discovery, while maintaining the pricing efficiency of the ETF market. We also show that there are more informed trades during the pre-open trading session than during the post-close trading session in the futures market.

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1. Introduction

The effect of extending the trading hours of the futures market is a subject that is ripe for research. On April 16, 2010, the China Financial Futures Exchange (CFFEX) started trading the HS 300 Index Futures (HSIF; China Shanghai Shenzhen 300 Stock Index Futures or Hushen 300 Index). The futures market opens 15 min earlier and closes 15 min later than the regular trading hours of the stock market. The morning extended trading session is from 9:15 a.m. to 9:30 a.m., whereas the afternoon extended trading session is from 3:00 p.m. to 3:15 p.m.¹

A general reason for extending the trading session is that the spot price can be revealed during the pre-open trading session, and liquidity can be digested and the following price will be estimated in the post-close trading session. If stock index futures provide significant price discovery, market participants will need to trade early and aggressively during the pre-open and post-close trading sessions. We specifically examine whether traders in extended trading sessions are better informed.

Previous studies have reported the effects of extended trading on the index futures market for the underlying spot market. These studies focus on volatility and price discovery in the pre-open and post-close trading sessions. [Chang et al. \(1995\)](#) investigate the post-close trading pattern of the S&P500 index futures market. They find that overall volatility declines substantially and immediately after the cash market closes and that the post-close session shows a pattern of U-shaped volatility. [Ho and Lee \(1998\)](#) address the trading pattern on the index futures market in Hong Kong in the post-close session from July 1994 to August 1995 and report results that are consistent with those of [Chang et al. \(1995\)](#). [Cheng and Cheng \(2000\)](#) examine the mean difference between the volatility of the Hong Kong futures and the underlying index before and after the extension of trading hours. The finding shows a reduction in volatility as well as in the correlation between the volatility in the pre-open trading session for both markets after the change. [Fong and Frino \(2001\)](#) find that volatility declines significantly during the post-close

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¹ Using hedging and arbitrage strategies, the more sophisticated traders and institutional investors may capture additional trading information during the extended trading sessions ([Cheng et al., 2004](#)).

session in the HSIF market, which is consistent with [Cheng and Cheng \(2000\)](#) and can be explained partly by the narrowing of the bid–ask spread.

In addition to this investigation of volatility, price discovery is also studied in extended trading sessions ([Chan, 2005](#); [Cheng et al., 2004](#)).² Cheng et al. find that there is more useful information in extended trading sessions in the Hong Kong futures market. They show that pre-open futures trades are more informative than trades in the post-close trading session and the first 15 min of regular-hour sessions. [Chan \(2005\)](#) also studies extended trading on the Hong Kong futures market. The empirical results show that the extension of trading hours stimulates the opening trading volume of the futures market, and the futures returns surrounding the market opening are less volatile, with smaller errors compared with those in the pre-extension period. These results suggest that private information is released during the pre-open session.³

The revelation of private information through extended trading has been examined in prior research. [Foster and Viswanathan \(1990\)](#) suggest that the informed traders strategically trade on their private information in securities markets. If their private information becomes less valuable over time, informed traders will trade more aggressively during the post-close extension period, before this information becomes public overnight. [Hiraki et al. \(1995\)](#) examine whether private information exists in the extended period of trading on the Osaka Nikkei futures market. The empirical results show that extended futures trading incorporates useful private information to explain subsequent underlying cash returns and that the pre-open and post-close extensions have different effects on price discovery. [Barclay and Hendershott \(2003\)](#) show that, although more information is revealed during the trading day than after hours on the Nasdaq, individual trades contain more information after hours than during the day. They point out that information asymmetry declines over the course of the day; therefore, the pre-open trading session in the current study offers more private information than does the post-close trading session.

Our research contributes to the literature in the following ways. First, our paper explores the emerging Chinese HS 300 index futures and HS 300 exchange-traded fund (ETF) markets, which have been the most dramatically expanding markets in the world over the past decade. China is now the second largest economy in the world and has been liberalizing its financial markets. However, China's stock market is not considered informationally efficient compared with other developed markets. Instead, it "has often been called a casino, with share prices bearing little connection to underlying economic conditions" ([Economist, 2015](#)). Therefore, it is interesting to examine whether futures trading will influence pricing efficiency of the ETF prices.

The HS 300 index futures contract was ranked the 10th among all the index futures and options contracts worldwide in 2014.⁴ Compared to indexes in Hong Kong, Japan, and the United States, the Chinese markets, however, are still not fully developed. The index futures and stock markets are open mainly to domestic investors only at this stage. 80% of investors are small retail investors, whereas institutions dominate in developed markets. Moreover, foreign investors through the quota system of Qualified Foreign Institutional Investor (QFII) program have always been restricted to hedging transaction only. See, among others, [Duggan \(2015\)](#) and [Wildau \(2015\)](#).

There are other distinctions between Chinese and developed markets in terms of structural and institutional characteristics. For example, daily price limits are imposed on trading in Chinese futures and ETFs, but there is no such price limit that halts trading in U.S. markets. Naked short selling is not allowed in China. An investor must have been a client of the few brokers approved by the exchanges for more than six months before the investor can trade on margin or short stock with the broker. See, e.g., [Gregoriou \(2012\)](#) for details. The strict restrictions on short selling and the tight government regulations make this futures contract an important financial product for betting both market downturns and upturns. As suggested by [Chen et al. \(2013\)](#), the futures market facilitates daily speculative trading in China. However, [Yang et al. \(2012\)](#) find that the futures market at its infancy stage does not significantly contribute to the price discovery of the Chinese stock index.

The trading mechanisms, contract specifications, and delivery systems for Chinese futures are also different from those for futures in U.S. or other mature markets. Therefore, Chinese futures markets may have a different price discovery process from other markets. In addition, we select in particular the readily tradable ETF contract instead of the underlying HS 300 index. Using ETF contracts, our research has important practical implications for a wide range of market participants, in addition to improving our general understanding of the interaction between trading and price discovery.

Second, we focus on the price discovery function of the index futures market in pre-open and post-close trading sessions using tick-by-tick high-frequency data. We find that returns and volatility in the pre-open trading session have significant impacts on returns for the first 15 min in the ETF market.⁵ These results indicate that the extended trading sessions of futures market provide price discovery for regular trading hours.⁶ Similar findings have been reported by [Cheng et al. \(2004\)](#) in the Hang Seng index futures market. Moreover, the pre-open trading session has greater information content than the post-close trading session. Significant price discovery can be realized within 15 min, suggesting that the trading information of extended trading sessions is released quickly and efficiently in the ETF market.

² The efficient opening price should be established since public and private information are accumulated during the overnight period.

³ [Barclay and Hendershott \(2008\)](#) give the trading and nontrading mechanisms for price discovery during the Nasdaq pre-open session. They find that the opening price became more efficient and price discovery shifted from opening trade to pre-open trade, which suggest that pre-open trading contributes to the efficiency of the opening price.

⁴ The number of contracts traded in 2014 is 217 billion. See 2014 FIA Annual Volume Survey.

⁵ In addition, we use both returns and volatility for exploring the price discovery. The price information includes not only returns but also volatility, which often has more information content ([French and Roll, 1986](#); [Mayhew, 2002](#)).

⁶ These results are also consistent with the Nasdaq pre-open trading market ([Cao et al., 2000](#)). In contrast to Gao et al. and other studies in the US stock markets, we provide a detailed analysis of price discovery and informational efficiency in the ETF and futures markets.

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