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Does options trading convey information on futures prices?

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ABSTRACT

This paper studies the presence of informed trading in Taiwan stock index options (TXO) and analyzes the informational role of foreign institutions in incorporating information into Taiwan stock index futures (TX). We have found that only the option-induced part (OOI) of the total TX order imbalance can predict future TX prices, and the OOI calculated from open-buy TXO, defined by Ni et al. (2008), provides incremental predictability. This finding shows that the price predictability stems from the information flow resulting from option transactions rather than from liquidity pressure. We conclude further that option transactions from foreign institutions provide the most significant predictability, out-of-the-money option transactions in particular. These empirical results show that option transactions conducted by foreign institutions have played the primary role in conveying the information inherent in the TXO market to the TX market, foreign institutions being delta-informed traders. Retail investors, the major players in both the TXO and TX markets, have done almost nothing of significance with regard to TXO information transmission into the TX market, with the exception of some near-the-money and out-of-the-money options.

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1. Introduction

Options are attractive to informed investors because of their high inherent leverage, as well as the ease of concealing themselves that options afford (Holowczak, Hu, & Wu, 2014). In this paper, we study the role of foreign institutions in incorporating the information from stock index options with their counterpart futures in the Taiwan futures market, which is the 18th-largest futures market in the world. When an informed investor places an order in the Taiwan stock index option (TXO) market, the TXO market makers have to make a counterpart offer. The market makers have cut the delta risk by trading Taiwan stock index futures (TX)¹. This is how market makers transfer the information in the TXO to the TX market², and we can conceive of TX order imbalance as being comprised of two parts: the option-induced order imbalance and the option-independent futures order imbalance.

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¹ The underlying assumption is that market makers perform full delta hedging. When analyzing the hedging cost of market makers in TXO, Wu, Liu, Lee, and Fok (2014) have also made this assumption, and thus it is reasonable for us to do so as well.

² Chan, Chung, and Fong (2002) and Hu (2014) document the interaction between options and the underlying stocks in a developed options market.

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One important feature of the Taiwan futures market, which is a major emerging market, is that it is heavily influenced by international political and economic fluctuations, and foreign institutions are more likely to possess such international market information. In addition, compared with developed futures markets such as the Chicago Mercantile Exchange (CME), information asymmetry is more prevalent among market investors, even in the index options market (Chang, Hsieh, & Lai, 2009; Lin, Tsai, & Chiu, 2016). Since foreign institutions are generally considered to have greater access to global transaction information, it is interesting to explore whether the option-induced order imbalance calculated from their option trades would predict future TX prices, thus shedding light on the role of foreign institutions in the information transmission process.

The question of whether foreign institutions are better informed in emerging markets has been studied for years. Richards (2005) shows that foreign capital flow has a significant impact on the index levels of six emerging markets in eastern Asia. Bae, Ozoguz, Tan, and Wirjanto (2012) find that highly investible stocks in emerging stock markets with a greater degree of accessibility for foreign investors incorporate global information more quickly than do non-investible stocks. In addition, Dvorak (2005) and Agarwal, Faircloth, Liu, and Rhee (2009) both provide evidence that foreign investors underperform domestic investors in Indonesia, although stock trading by foreign investors accounts for a meaningful percentage. Moreover, Lee, Liu, Roll, and Subrahmanyam (2004) state that large domestic institutions, rather than foreign institutions, conduct the most informed trades in the Taiwan stock market. On the surface, we have mixed results; however, these findings reach a concurrence that foreign investors have an advantage in processing market-wide information, while domestic investors have an advantage with regard to firm-specific information.

In addition to the abundant evidence in the stock market, Chang et al. (2009) construct put-call ratios using TXO transaction data and find that only the options trading from foreign institutions can predict future prices of the underlying index, although they engage in a small proportion of total volume. This finding contrasts with the finding in Pan and Poteshman (2006) that there is little informed trading in an index options market. Subsequently, Lin, Tsai, and Chiu (2016) show that limit orders placed by foreign institutions exhibit superior predictability of future option price changes in the TXO. The implication of the two studies is twofold. First, they challenge the general view, at least in emerging markets, that the information content of index options markets is very low. Second, these findings support the claim that foreign institutions have better market-wide information than do domestic institutions in an emerging options market.

The TXO and TX markets provide a good venue for investigating whether foreign institutions have better market-wide information in the Taiwan futures market, because both of them are written on the Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX), representing the overall performance of the Taiwan stock market. Our sample covers the period from July 1, 2009 through November 30, 2012. During this period, the daily average trading volume of the TXO and TX amounted to approximately 325,000 contracts and 106,000 contracts, respectively, accounting for roughly 85 percent of the total trading volume in the Taiwan futures market. By participant, retail investors accounted for roughly 56.17%, domestic institutions for 32.03% and foreign institutions for approximately 11.80% of total TXO trading volume³. Compared with domestic investors, foreign institutions allocate more trades to out-of-the-money option contracts and tend to initiate a larger proportion of transactions, which potentially indicates heterogeneity among the trading patterns of the three classes of investors.

We construct the daily total order imbalance, futures order imbalance and options order imbalance as information variables, as proposed by Hu (2014). To ensure that these variables are applicable to the TXO and TX, we make some amendments. First, we use nearby TX contracts to represent the overall TX market, because their trading volume amounted to roughly 85% of total TX trading volume during our sample period⁴. Second, we standardize three order imbalance variables using the sum of the quadrupled daily trading volume for nearby TX contracts and the daily trading volume for TXO; the quadrupling derives from the fact that a per-index point of the TXO stands for NTD50, while for the TX it is NTD200. If foreign institutions have market-wide information and they prefer to trade options to realize their information advantage, we would expect that the options order imbalance calculated from the trading volume of foreign institutions could predict future TX prices.

In contrast to prior studies that gauge the relative performance among three classes of investors in the Taiwan futures market, we focus on the interaction between transactions in the TXO market and TX market rather than that between the TXO market and the underlying TAIEX (Chang et al., 2009), because market makers use the TX rather than the underlying index to hedge direction risk. Moreover, referring to Holowczak et al. (2014), we use delta exposure-based options order imbalance. This provides the benefit of retrieving higher-quality aggregate information from option volume as compared with the equal weighting method (Chang et al., 2009; Chiu et al., 2014) and the one pair method, choosing only one pair of call and put option contracts, (Lin, Tsai, & Chiu, 2016) according to the line of reasoning in Holowczak et al. (2014). Finally, unlike Chang et al. (2009) and Chiu, Lee, and Wang (2014), who use newly open-buy option trades, and Lin, Tsai, and Chiu (2016), who use order book data, we employ more publicly observable option trades data as suggested by Pan and Poteshman (2006).

Our three main findings provide insight into the respective roles of three classes of investors in transmitting information from the TXO to the TX market. Our first empirical investigation is to examine the presence of informed trading in the overall TXO market. We find that the total order imbalance in the TX can predict future TX prices. However, when decomposing the

³ As do Lin, Tsai, Zheng, and Qiao (2016), we exclude the trading volume by market makers in the TXO market.

⁴ When analyzing the relationship between DAX futures and DAX options, Schlag and Stoll (2005) also use nearby DAX futures to represent price movements in the index.

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