

## Closing price manipulation in Borsa İstanbul and the impact of call auction sessions

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### Abstract

To reduce extraordinary price movement and to ensure more effective price formation at closing time, Borsa İstanbul implemented closing call auction sessions on March 2, 2012. This study tests the effect of closing call auction sessions on closing price manipulation in Borsa İstanbul using 102 shares in various indexes. The analysis focuses on 624 days from November 1, 2006 to May 31, 2012. The results reveal an upward-oriented closing price manipulation prior to the implementation of closing call auction sessions. The data show a significant elimination in closing price manipulation following the implementation of closing call auction sessions.

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### 1. Introduction

Closing prices are used for many purposes including valuations, marking-to-market accounting, valuation of funds and their liquidations, measuring the performance of portfolio managers, and so on. These purposes provide sufficient grounds for closing price manipulation. Exchanges and policymakers have to ensure that closing prices are efficient and free of extraordinary movement or manipulation. For these reasons, closing prices are often the subject of research.

Although Terry (1986) and Harris (1989) could not identify any manipulation of closing prices, Comerton-Forde and Rydge (2006), Comerton-Forde, Lau, and McInish (2007), Comerton-Forde and Putnins (2011), Pinfold and Danyang

(2012), Felixson and Pelli (1999); and Hillion and Suominen (1998b) discovered manipulation in closing prices. Many studies have proposed call auction sessions at the opening or closing of continuous auction sessions to ensure more efficient, manipulation-free prices (Barclay, Litzenberger, & Warner, 1990; Hillion & Suominen, 2004; Muscarella & Piwowar, 2001; Pagano & Schwartz, 2003, 2005; Smith, 2006; Theissen, 2000).

Market manipulation has been a pervasive issue in Borsa İstanbul since the late 1990s, and the Capital Markets Board of Turkey (CMB) and Borsa İstanbul have dealt with many manipulation cases. At one point, Borsa İstanbul began opening call auction sessions and the use of unique client IDs as precautionary measures against market manipulation. Closing call auction sessions were also proposed by CMB, Küçükkocaoğlu (2005, 2008b) and Özcan (2011) to prevent market manipulation. Finally on March 2, 2012, call auction sessions were implemented to reduce extraordinary price movements and to ensure more efficient price formation in

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Borsa İstanbul. This study investigates whether or not closing call auction sessions effectively serve these purposes. Thus, this study will serve as feedback to CMB and Borsa İstanbul.

The trader performance method developed by [Felixson and Pelli \(1999\)](#) is utilized in this study to test for manipulation of closing prices. The data utilized in this work can be consolidated on the basis of investors; therefore, this article does not deal with the transactions of dealers or brokerage houses. Instead, this work is an investor-based analysis that consolidates the transactions of individual investors in all the brokerage houses with which they do business.

Our study does not use the price at the  $k^1$ -15 min mark for returns in the final 15 min of trading. Instead, the weighted average price (WAP) up to the final 15 min is calculated for each investor on the basis of the shares of a particular day. Then, the WAP is calculated using the price at the  $k$ -15-min mark for returns in the final 15 min of trading. By doing so, our work manages to overcome the challenges faced by [Felixson and Pelli \(1999\)](#).

This study shows that there had been closing price manipulations as defined by [Felixson and Pelli \(1999\)](#) prior to the implementation of closing call auction sessions. [Küçükocaoğlu \(2005\)](#) also emphasized the presence of upward-oriented closing price manipulation in Borsa İstanbul. Furthermore, the coefficient of the cumulative net position occurring prior to the final 15-min period to the total quantity of the transactions is positive and highly significant. This supports the argument that closing price manipulation had been occurring. It is observed that the implementation of closing call auction sessions have significantly eliminated closing price manipulation. The effect of closing call auction sessions on Borsa İstanbul conforms to the results of [Comerton-Forde and Rydger \(2006\)](#), [Comerton-Forde et al. \(2007\)](#), [Comerton-Forde and Putnins \(2011\)](#), and [Pinfold and Danyang \(2012\)](#).

The finding of this study also conform to the conclusions of both [Akyol and Michayluk \(2007\)](#), who found closing price manipulation within the scope of the small orders method, and [Küçükocaoğlu \(2005, 2008a\)](#), who revealed the existence of closing price manipulation in Borsa İstanbul on the basis of intraday broker performance.

The remainder of this paper is as follows. The second section provides a brief literature review. Section 3 describes the data and lays out methodology. Section 4 elaborates on the empirical findings. The last section concludes the discussion.

## 2. Literature review

As closing prices are used for many purposes,<sup>2</sup> they are always subject to manipulation. The general finding of the studies performed on this issue is that manipulation attempts and their impact on share prices are concentrated in the 1-h

time period prior to close of session. Studies have also found that the reversal this effect takes place in the first 30 min of session the following day.

According to [Hillion and Suominen \(1998a, 1998b, 2004\)](#), [Felixson and Pelli \(1999\)](#), [McSherry and Sofanos \(1998\)](#), [Lee and Mathur \(1999\)](#), [Cushing and Madhavan \(2000\)](#) and [Küçükocaoğlu \(2005\)](#), the following are some underlying motives for manipulation:

- Attempts are made to increase closing prices of shares in margin trading, short sales and the borrowing and lending of securities to either prevent decreases in the value of securities held for margin account, or to drive up their value,
- Attempts are made to drive up closing prices of shares in a given portfolio to demonstrate that the performance of the portfolio managers or brokers is sound,
- Price interventions are attempted in order to ensure convergence of both spot and forward prices to a desired price at the date of maturity in the derivatives market to either maximize profit or minimize cost,
- Intraday traders aim to intervene in prices for profit,
- Stockbrokers who perform brokerage transactions for foreign clients manipulate prices to achieve a target average price given by those clients.

While [Terry \(1986\)](#) and [Harris \(1989\)](#) did not identify any effect of manipulation on closing prices, [Felixson and Pelli \(1999\)](#) found that though weak, manipulative transactions influenced price movements at close of session in the Finland Stock Exchange. [Hillion and Suominen \(1998b\)](#) also discovered closing price manipulation. The common point of both [Felixson and Pelli \(1999\)](#) and [Hillion and Suominen \(1998b\)](#) is that dealer activities are a possible reason for closing price manipulation. [Miller \(1989\)](#) made this argument as well, stating that the reason for the rise in prices towards close of session was the ambition of index fund managers to increase the value of index funds by increasing the closing prices of shares included in the portfolio. Many other studies have also found that closing prices are manipulated ([Comerton-Forde & Putnins, 2011](#); [Comerton-Forde & Rydger, 2006](#); [Comerton-Forde et al., 2007](#); [Huang & Chan, 2014](#); [Pinfold & Danyang, 2012](#)).

After [Hillion and Suominen \(1998b\)](#) reached the conclusion that high returns and volatility towards close of session arose from closing price manipulation in the Paris Stock Exchange, they proposed closing call auction sessions for this exchange. Hillion and Suominen once again suggested call auction sessions to prevent closing price manipulation after applying their new intermediation-based theoretical model in 2004.

[Comerton-Forde and Rydger \(2006\)](#) in Australia; [Comerton-Forde et al. \(2007\)](#) in Singapore; [Comerton-Forde and Putnins \(2011\)](#) in Australia; [Pinfold and Danyang \(2012\)](#) in New Zealand; and [Huang and Chan \(2014\)](#) in Taiwan investigated the effect of call auctions on market manipulation. They found that closing call auction sessions reduced the incidence of market manipulation. [Huang and Tsai \(2008\)](#) found that

<sup>1</sup>  $k$  stands for *closing time*.

<sup>2</sup> See also [Atilgan, Bali, and Demirtas \(2013\)](#), [Özcan \(2012\)](#), [Qian, Xu, and Yu \(2014\)](#) and [Kadioğlu \(2014\)](#) for more information.

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