# HOW TO REGULATE SPOOFING?

**[1]VIKTORIA DALKO, [2]MICHAEL WANG**

[1]Hult International Business School, Cambridge, Massachusetts, USA
[2]Research Institute of Comprehensive Economics, Quincy, Massachusetts, USA

**Abastract**- The purpose of this study is to assess the order-to-trade ratio and resting time regulations recently enacted by the European Commission. We proceed with examining the background of spoofing. The examination uncovers that the incomplete display of limit order information by the stock exchange provides the key to spoofing that is essentially manipulation of the limit order display. Therefore, the effectiveness of the order-to-trade ratio and resting time regulations are limited since neither of them targets the incomplete display of limit orders.

**Keywords**- Flash Crash, high-frequency trading, spoofing, order-to-trade ratio, resting time, complete display of order information.

## I. INTRODUCTION

The "Flash Crash" on the New York Stock Exchange (NYSE) on May 6, 2010 caused the biggest intraday point drop in the Dow in its history (near 1000 points) (Easley et al., 2010). The incident reminded global securities regulators and investors of the potential threat that high-frequency trading (HFT) can bring to financial markets. In response, the securities regulators of the major developed economies have proposed or even enacted rules to curb this strategy. The European Commission adopted MiFID II (Markets in Financial Instruments Directive II) on October 20, 2011(European Commission, 2011a). MiFID II has added new regulatory measures safeguarding financial markets from excessive activity of algorithmic and high-frequency trading. Two proposals targeting these types of trading are of particular interest. One is the maximum order-to-trade ratio below penalty. The other is the minimum resting time of submitted orders before a per order charge (European Commission, 2011b). Under the directives by the MiFID II, BaFin, the German regulator, enacted the High-Frequency Trading Act on May 15, 2013. It introduced a penalty for high order-to-trade ratios (in effect from December 1, 2013). France levied a 0.01% tax if high-frequency traders cancel their orders within a half-second (Ait-Sahalia and Saglam, 2013). The US Securities and Exchange Commission proposed the Limit Up/Limit Down rule on May 31, 2012 and implemented it as a regulation soon after (Securities and Exchange Commission, 2012). Many other nations, such as Australia, Canada, India, Italy, and UK, also acted in this regard (Ait-Sahalia and Saglam, 2013).

## II. ANALYSIS OF SPOOFING

Spoofing is a recognized manipulative practice. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 defines spoofing as the illegal practice of bidding or offering with intent to cancel before execution (Kluchenek and Kahn, 2013). It is essentially the same as fake orders or fake trading. It can be done with superfast computers or HFT (Rossi et al., 2015). It can also be done manually (Klein et al., 2012). The core of this trick is manipulation of order display by submitting large orders near the current price with the intent to cancel them quickly. The main purpose is to induce other investors to trade in the direction desired by the manipulator so he can trade against them later. There are two basic scenarios. One is that the manipulator has a long (short) position. He expects to unwind the position at a higher (lower) price. He places one or multiple large buy (sell) limit orders just below the best bid (above the best ask) so his order(s) can be displayed to the entire market. It is very likely that many investors will see the display and speculate that a trend is in the forming. Thus they jump to buy (sell) and push the price higher (lower). Then the manipulator quickly cancels his orders and trades against the induced investors. He unwinds his position at a sure profit. This type of spoofing is also called momentum ignition (Securities and Exchange Commission, 2010; Biais and Foucault, 2014).

Another scenario is that the manipulator does not have a position but wants to establish a long (short) position. He expects to buy (sell) shares at a lower (higher) price than the current price. To push the price lower (higher), he places one or multiple large sell (buy) limit orders so that the orders are near the NBBO (National Best Bid and Offer) and displayed to the entire market. Then numerous investors are induced to sell (buy) when they see large sell (buy) orders are entering the market. Their herding sell (buy) pushes the share price lower (higher) and reaches the manipulator's expectation. Thus he trades against the herding investors by establishing a long (short) position at a lower (higher) price (Biais and Foucault, 2014).

Both scenarios share the same key element, i.e., manipulation of the limit order display near the NBBO. Because the exchange displays only the open orders without showing the executed or cancelled orders, the order information displayed to the entire

market is incomplete. The incomplete order information displayed by the exchange is the loophole. Some investors have taken advantage of this loophole and created the spoofing strategies. This explains why some traders manipulate order display in order to induce herding with a high success rate (Lee et al., 2013). Furthermore, spoofing traders simply submit and quickly cancel orders and are most likely successful in lining up the perception of numerous investors with submitted orders. This is one of the most inexpensive manipulation strategies compared to many well-known illegal tricks such as fictitious trading. However, the consequence it brings to financial markets is not always manifested in extreme volatility but it is there nonetheless – except for the recent "Flash Crash" episodes on NYSE and India's National Stock Exchange (Munshi and Stafford, 2012).

## III. ASSESSMENT OF ORDER-TO-TRADE RATIO AND RESTING TIME REGAULATIONS

By understanding the key to spoofing, one can assess the newly enacted regulations proposed by the European Commission. The maximum order-to-trade ratio limits the number of orders that can be cancelled, using the total number of submitted orders as the reference. The effectiveness of this regulation lies in reducing the frequency of spoofing occurrences. Its insufficiency is that it cannot eliminate spoofing by acting alone. Since it does not distinguish if a cancelled order is due to manipulation or not, some non-manipulative cancellations are also limited together with spoofing cancellations.

The minimum resting time targets the speed of cancellations. Since the minimum time length is predefined and universal to any instrument, the effectiveness of the regulation depends on how fast a limit order near the NBBO is executed. In other words, if the difference of the order's price and the mid-price of the NBBO is given, the more actively traded instrument yields the shorter resting time before the order gets executed. However, the loophole of the regulation is that the manipulator can switch to less actively traded instruments to seek a longer resting time than the minimum required by the regulation. Another loophole is that the manipulator can choose a longer "distance" from the NBBO for the spoofing orders to avoid them being executed before the minimum resting time (Biais and Foucault, 2014).

When the two regulations are combined, the effectiveness increases. However, spoofing is not yet completely eliminated. The most crucial element in the manipulation is still untouched –the incomplete display that lists only submitted orders but delists executed and cancelled orders. It is this lack of transparency regarding critical trading data that gives rise to spoofing.

More than half of the financial markets in the world today use a real-time limit order book (LOB) as a display system to facilitate trade (Gould et al., 2013). To demonstrate how a LOB functions, we choose Level II in the US equity markets as an example. Level II is a widely used real-time LOB, through subscription, by both institutional and individual investors (NasdaqTrader.com, 2016). Level II displays open interest only. In other words, it displays only submitted orders that have not been executed or cancelled. However, there is no way to know if those orders that are not displayed any more have been executed or cancelled. This display is incomplete and provides opportunities for manipulators to misguide numerous market participants as a manipulator placing spoofing orders or fake orders can create the appearance of rich buy/sell liquidity. Thus herding to place orders in the direction desired by the spoofing trader is induced. Subsequently, spoofing manipulation has been successfully executed at a profit, except that the spoofing trader gets spoofed.

## IV. TRANSPARENCY OF ORDER DISPLAY SYSTEMS

In the recent directive issued by the European Union, a desire to establish "a comprehensive regulatory regime governing the execution of transactions in financial instruments" is expressed (European Union, 2014, p. 351). The order-to-trade ratio and resting time regulations enacted by major European financial markets are good regulatory improvement in this direction. The important features of the new regulations are that they are quantifiable, adjustable and can be automated by fast computers. They are complementary to conventional legal enforcement. They may represent the future direction of regulation in the era of electronic trading platforms (Markham, 2014).

Based on a vast number of empirical research data and prosecuted market manipulation cases, Klein et al. (2012) categorized nine variables at a trader's discretion in a trading day. They are total order size, number of orders, net share ownership, bid-ask spread, time delay between two consecutive orders, timing of order placement, genuineness of order placement, multiple accounts, and collusion with other traders. They proposed eight regulatory measures with each targeting one or multiple variables. The eight measures are intended for more effective regulations against certain types of market manipulation. These measures are quantifiable, adjustable, inexpensive, and can be computerized.

To regulate spoofing or fake orders, the authors proposed a daily volume limit, a time interval between two consecutive order submissions, the

display of complete order information and the ratio of canceled to total orders. Except for the display of complete order information, the other three are reflected in the order-to-trade ratio and resting time regulations already enacted by the European Commission. However, as discussed earlier, the most critical element in spoofing – quick order cancellation after submission – is due to the incomplete display of order information. Neither the order-to-trade ratio regulation nor the resting time regulation closes this loophole completely. Therefore, this paper suggests that the complete display of order information be added to the regulatory framework. The complete display should include the submitted orders, executed orders and cancelled orders for the recent history together with the past prices. The exchange can predefine the length of the recent history for display. For example, the length covers the past five prices and corresponding executed and cancelled orders.

Why is the complete display of order information the most effective regulation against spoofing? Because all market participants can see the true picture of supply and demand behind the price formation; the full life-cycle of an order from submission to execution or cancellation is revealed. The spoofing order cycle can be easily seen through by market participants. Subsequently, spoofing cannot induce numerous investors to herd in the direction of the spoofing orders and spoofing simply will no longer work.

The proposed regulation is inexpensive and easy to implement by exchanges. It does not impose limits on order number, order size, resting time, or any other variable that affects order submission. The reduced liquidity that may be caused by implementation of this proposed regulation (Friederich and Payne, 2015) is not so-called good liquidity. It is the induced liquidity by spoofing manipulation before implementation of the proposed regulation. This type of liquidity can lead to more volatility.

The order-to-trade ratio and resting time regulations are effective regulations. However, they cannot eliminate spoofing. If they are combined with the proposed complete display regulation, spoofing will likely disappear completely.

## CONCLUSION

This paper has assessed the order-to-trade ratio and resting time regulations recently enacted by the European Commission in response to the Flash Crash. By examining the spoofing manipulation in detail, the paper finds the loophole in regulating spoofing that is the incomplete display of order information. This loophole enables spoofing to be prevalent and frequent in financial markets. It reveals why effectiveness of the order-to-trade ratio and resting time regulations are limited. The paper proposes to add complete display of order information to the enacted order-to-trade ratio and resting time regulations in order to prevent spoofing completely.

Dr. Viktoria Dalko earned her Ph. D. at the University of Pennsylvania in 1992. Currently she is a professor of finance at Hult International Business School.

Dr. Michael Wang obtained his Ph. D. at the University of Illinois at Urbana-Champaign in 1996. From 1999 to present, he works as a senior researcher at the Research Institute of Comprehensive Economics.

## REFERENCES

[1] Ait-Sahalia, Y. and Saglam, M., "High frequency traders: taking advantage of speed", NBER Working Papers 19531, Cambridge, MA, 2013.

[2] Biais, B. and Foucault, T., "HFT and market quality", Bankers, Markets and Investors, Vol. 128 No. 5, pp. 5-19, 2014.

[3] Easley, D., Lopez de Prado, M.M. and O'Hara, M., "The microstructure of the 'Flash Crash': flow toxicity, liquidity crashes and the probability of informed trading", Journal of Portfolio Management, Vol. 37, pp. 118–128, 2010.

[4] European Commission, "Updated rules for markets in financial instruments: MiFID 2", October 20, 2011a; European Commission, http://ec.europa.eu/finance/securities/isd/mifid2/index_en.htm.

[5] European Commission, "Impact assessment accompanying the document Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Markets in financial instruments [Recast] and the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Markets in financial instruments", Commission Staff Working Paper, pp. 128-129, 2011b.

[6] European Union, "Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU", Official Journal of the European Union, Vol. 173, p. 351, 2014.

[7] Friederich, S. and Payne, R., "Order-to-trade ratios and market liquidity", Journal of Banking and Finance, Vol. 50, pp. 214-230, 2015.

[8] Gould, M.D., Porter, M.A., Williams, S., McDonald, M., Fenn, D.J. and Howison, S.D., "Limit order books", Quantitative Finance, Vol. 13 No. 11, pp. 1709-1742, 2013.

[9] Klein, L.R., Dalko, V. and Wang, M.H., Regulating Competition in Stock Markets: Antitrust Measures to Promote Fairness and Transparency through Investor Protection and Crisis Prevention, John Wiley & Sons, Hoboken, NJ, pp. 101-109, 2012.

[10] Kluchenek, M.F. and Kahn, J.L., "Deterring Disruption in the Derivatives Markets: A Review of the CFTC's New Authority over Disruptive Trading Practices", Harvard Business Law Review Online, Vol. 3, pp. 120-132, 2013.

[11] Munshi, N. and Stafford, P., "Indian shares suffer $60bn 'flash crash'", Financial Times, October 5, 2012.
[12] Markham, J., Law Enforcement and the History of Financial Market Manipulation, M.E. Sharpe, Armonk, NY, 2014.
[13] Lee, E.J., Eom, K.S. and Park, K.S., "Microstructure-based manipulation: strategic behavior and performance of spoofing traders", Journal of Financial Markets, Vol. 16 No. 2, pp. 227-252, 2013.
[14] NasdaqTrader.com (2016), "NASDAQ Level 2 (NQDS)", 2016; NASDAQ, http://www.nasdaqtrader.com/Trader.aspx?id=nqds.
[15] Rossi, M., Deis, G., Roche, J. and Przywara, K., "Recent civil and criminal enforcement action involving high frequency trading", Journal of Investment Compliance, Vol. 16 No. 1, pp. 5-12, 2015.
[16] Securities and Exchange Commission, "Concept release on equity market structure", Federal Register, Vol. 75 No. 13, p. 3609, 2010.
[17] Securities and Exchange Commission, "Investor bulletin: measures to address market volatility", May 31, 2012; SEC, https://www.sec.gov/investor/alerts/circuitbreakersbulletin.htm.

★★★