Chapter 6

HIGH-FREQUENCY TRADING THROUGH INTRADAY EXTREME PRICE MOVEMENTS OF BIST30 STOCKS[1, 2]

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INTRODUCTION

Easley, Kiefer and O'Hara (1997) select Ashland Oil company stock for their analysis on informed trading. The authors state that the purpose in focusing on this stock is its frequent trading that would lead to high-quality results. The 1990 dataset utilized for this stock involves 41 trades on an average day.

Today, an average stock in developed markets is traded tens of thousands of times on a day. While number of trades increased by thousand-fold or more; the change in trading purposes, trading environment, market participants and trading ways have been even more essential and influential. Current financial markets are characterized by ultra-fast trading which means not only "trading ultra-fast", but also a relatively new trading type in markets, that is high-frequency trading (HFT).4

Harris (2003) elaborately categorizes market agents into three: profit-oriented traders, utility-oriented traders (traders with motives other than trading profits) and inefficient traders; and describes the trading environment as a zero-sum game where utility traders – and inefficient traders – lose and profit-motivated traders win on average. High-frequency traders (HFTs) are the new type of traders, or the upgraded form of traditional profit-motivated traders. Thus, today, the comparative advantages of profit-motivated traders are much more pronounced with the speed boost occurred. One essential difference between the profit-motivated traders described in Harris (2003) or the traders back in 1990 in Easley, Kiefer and O'Hara (1997) and current HFTs is that the new traders are not human traders, but computers running algorithms live.

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[4] Terms high-frequency trading, fast-trading, ultra-fast trading and low latency trading are usually used interchangeably in the literature, which is also the case in this paper.

We perform various robustness checks such as running a model without the control variables or running the main model with alternative HFT definitions and alternative EPM calculation, reaching to qualitative same results.

Further studies may concentrate on the consequences of changing HFT activity through EPMs. Recovery from the extreme events can be examined with respect to the role of altered HFT activity. HFT activity and role in the intraday crashes such as the major event of 2010 Flash crash are studied in the literature (e.g., Kirilenko et al., 2017). However, the link between extreme price movements and crashes with an emphasis on HFT activity can be inquired more elaborately. When do the negative extreme price movements turns into flash crashes and the role of HFTs in this link can be explored more.

REFERENCES

Bazzana, F., & Collini, A. (2020). How does HFT activity impact market volatility and the bid-ask spread after an exogenous shock? An empirical analysis on S&P 500 ETF. *The North American Journal of Economics and Finance*, *54*, 101240.

Boehmer, E., Li, D., & Saar, G. (2018). The competitive landscape of high-frequency trading firms. *The Review of Financial Studies*, *31*(6), 2227-2276.

Brogaard, J. (2010). High frequency trading and its impact on market quality. *Northwestern University Kellogg School of Management Working Paper*, *66*.

Brogaard, J., Carrion, A., Moyaert, T., Riordan, R., Shkilko, A., & Sokolov, K. (2018). High frequency trading and extreme price movements. *Journal of Financial Economics*, *128*(2), 253-265.

Brogaard, J., Hendershott, T., & Riordan, R. (2017). High frequency trading and the 2008 short-sale ban. *Journal of Financial Economics*, *124*(1), 22-42.

Budish, E., Cramton, P., & Shim, J. (2015). The high-frequency trading arms race: Frequent batch auctions as a market design response. *The Quarterly Journal of Economics*, *130*(4), 1547-1621.

Carrion, A. (2013). Very fast money: High-frequency trading on the NASDAQ. *Journal of Financial Markets*, *16*(4), 680-711.

Chaboud, A. P., Chiquoine, B., Hjalmarsson, E., & Vega, C. (2014). Rise of the machines: Algorithmic trading in the foreign exchange market. *The Journal of Finance*, *69*(5), 2045-2084.

Chung, K. H., & Lee, A. J. (2016). High-frequency Trading: Review of the Literature and Regulatory Initiatives around the World. *Asia-Pacific Journal of Financial Studies*, *45*(1), 7-33.

Daştan, I., & Ersan, O. (2020). Yüksek-frekanslı işlemlerin Borsa Istanbul'daki uç fiyat hareketleri çerçevesinde incelenmesi. International Congress of Management, Economy and Policy ICOMEP'20, December 5-6, 2020, Istanbul, pg.59.

Easley, D., Kiefer, N. M., & O'Hara, M. (1997). One day in the life of a very common stock. The Review of Financial Studies, 10(3), 805-835.

Ekinci, C., & Ersan, O. (2018). A new approach for detecting high-frequency trading from order and trade data. *Finance Research Letters*, *24*, 313-320.

Ekinci, C., & Ersan, O. (2020). High-frequency trading and market quality: Case of a

"slightly exposed" market. Working paper.

Ersan, O., Dalgic, N., Ekinci, C. E., & Bodur, M. (2020). High-Frequency Trading and its Impact on Market Liquidity: A Review of Literature. *Alanya Akademik Bakış*, *5*(1), 345-368.

Ersan, O., & Ekinci, C. (2016). Algorithmic and high-frequency trading in Borsa Istanbul. *Borsa Istanbul Review*, *16*(4), 233-248.

Hagströmer, B., & Nordén, L. (2013). The diversity of high-frequency traders. *Journal of Financial Markets*, *16*(4), 741-770.

Haldane, A. G. (2010). *Patience and finance*. Speech to Oxford China business forum. Beijing: Bank of England.

Harris, L. (2003). Trading and exchanges: Market microstructure for practitioners. OUP USA.

Hasbrouck, J., & Saar, G. (2009). Technology and liquidity provision: The blurring of traditional definitions. *Journal of financial Markets*, *12*(2), 143-172.

Hautsch, N., Noé, M., & Zhang, S. S. (2017). The Ambivalent Role of High-Frequency Trading in Turbulent Market Periods. CFS Working Paper, No. 580. *Available at SSRN, 3020142*.

Hoffmann, P. (2014). A dynamic limit order market with fast and slow traders. *Journal of Financial Economics*, *113*(1), 156-169.

Kirilenko, A., Kyle, A. S., Samadi, M., & Tuzun, T. (2017). The flash crash: High-frequency trading in an electronic market. *The Journal of Finance*, *72*(3), 967-998.

Leal, S. J., & Napoletano, M. (2019). Market stability vs. market resilience: Regulatory policies experiments in an agent-based model with low-and high-frequency trading. *Journal of Economic Behavior & Organization*, *157*, 15-41.

Manahov, V. (2016). Front-running scalping strategies and market manipulation: Why does high-frequency trading need stricter regulation?. *Financial Review*, *51*(3), 363-402.

O'Hara, M. (2015). High frequency market microstructure. *Journal of Financial Economics*, *116*(2), 257-270.

Nawn, S., & Banerjee, A. (2019). Do proprietary algorithmic traders withdraw liquidity during market stress?. *Financial Management*, *48*(2), 641-676.

Popper, N. (2012). *High-speed trading no longer hurtling forward*. New York Times (October 14, 2012).