Chapter 8

FinTech and Stock Market Behaviors: The Case of Borsa Istanbul

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ABSTRACT

This chapter examines the effects of high-frequency trading (HFT) and algorithmic trading (AT) activities, which represent important technological developments in financial markets in the past two decades, on Borsa Istanbul in terms of volatility. To clarify stock market behaviors in terms of volatility, asymmetry, and risk return after the BISTECH transition, the GJR-GARCH-in-Mean and I-GARCH models were used. The dataset consists of the daily stock return series of the main and sub-sector indexes of Borsa Istanbul, covering the period from October 24, 2012 to June 1, 2018. Although there are mixed results for the sub-indexes, it is observed that in the post-BISTECH period, volatility increases significantly in the BIST 100 and BIST 30 indexes, where AT and HFT activities are used more frequently. In particular, the duration of volatility returns to average after shock increases about seven times for BIST 100 and about eight times for the BIST 30 in the post-BISTECH period. Overall, the results indicate that AC and HFT activities may have disruptive effects on financial markets.

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INTRODUCTION

In recent years, there has been a significant increase in both high-frequency trading (HFT) and algorithmic trading (AT) activity in financial markets. Most of the transaction volume in developed markets is created by HFT. Despite this rapid increase in AT and HFT activities, our knowledge about their effects on financial markets is limited. Some researchers say that these developments have benefits like price discovery efficiency, while others note that they may lead to an increase in volatility and adverse selection problems. Although these debates continue, this technological transformation, which began in the U.S. in the 1990s, has spread rapidly to developing countries in recent years. In parallel with these developments, Borsa Istanbul and NASDAQ signed a strategic cooperation agreement in 2014. The first stage of the “Technology Transformation Program” is called BISTECH, a stock market transaction system that was put into operation in 2015, along with Genium INET software and other technological components. The first stage of BISTECH, which consists of many large-scale and years-long programs, was put into practice on November 30, 2015. Borsa Istanbul and NASDAQ announced that Borsa Istanbul has started to use nine leading technologies, including transaction systems, data distribution, index calculation, market surveillance, reporting, and pre- and post-transaction risk management. With the BISTECH Project, Borsa Istanbul has increased the number of orders processed from 4,000 messages to 100,000 messages per second, and the transmission speed of orders has decreased from 1 millisecond to 100 microseconds with the FIX standard protocol. The second phase of the program, the Futures and Options Market (VIOP), began operating on the BISTECH system on March 6, 2017. According to policymakers, these transformations are expected to lead to a reliable, high-performance, fast and multi-instrumental structure in the VIOP. The VIOP, which complies with international standards in terms of technical features, is becoming an international market where investors can use the existing technological systems of foreign institutional investors, which operate by using a similar technological infrastructure.

Although these technological innovations can provide advantages such as increased liquidity, reduced transaction costs and increased competition, high-frequency trading and algorithmic trading may have some negative effects on other market participants. These effects could include the adverse selection problem, increased trading volume and market volatility. Since the introduction of AT strategies, the limit order submissions and cancellations as well as intraday price volatility have increased in some markets (Hagströmer and Norden, 2013). AT might also increase volatility because many algorithms are similar, and therefore their trades are highly correlated, as suggested by Chaboud et al. (2014) and Kalejian and Mukerji (2016). Another concern about HFT activities is that they may increase price movements
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