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Research Paper

Order Imbalance and stock price realized volatility in Tehran Stock Exchange and Iran Farabourse[1]

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INTRODUCTION

Volatility in financial markets serves as a statistical measure of the dispersion of returns for a specific security, such as a stock or market index. This metric can be calculated using the standard deviation or variance of the price or return of the share or market index. Typically, in financial markets, the higher the volatility of a bond or index, the riskier the investment in that bond is considered. Volatility is indicative of the degree of uncertainty concerning changes in the value of any type of security. High volatility implies that the price of securities can fluctuate within a broader range. This suggests that stock prices can undergo significant changes in either direction within a short period.

The occurrence of the financial crisis of 2008 in the United States highlighted the significance of measuring risk and uncertainty in financial markets for policymakers, traders, and researchers. Consequently, research on measuring the risk of financial markets gained increased importance. One of the crucial criteria for risk measurement

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is the volatility of financial markets. Therefore, volatility modeling, specifically conditional variance, has been at the forefront of financial considerations and holds great significance in predicting future market fluctuations. Modeling yield fluctuations in stock markets is a crucial aspect, serving in forecasting stock returns and predicting market fluctuations.

These forecasts are applicable in various financial activities, including risk management, pricing of financial derivatives, risk hedging, market making, selection of financial portfolios, and many others. Consequently, the estimation of fluctuations in financial markets becomes crucial. Typically, risk is closely tied to the level of volatility; a stock or asset with higher volatility is considered riskier due to increased uncertainty. It's important to note that risk, in this context, also has a positive aspect as it signifies the potential for higher profits most of the time.

Volatility in financial markets represents how the price of a specific type of security changes over a given period. Percentage volatility gauges the average difference between the price and the average price during a specific time frame. The higher the volatility of a security, the greater the level of uncertainty.

MATERIALS AND METHODS

The issue with the previously presented volatility models lies in their inability to effectively capture the main characteristics of financial data. Moreover, there was a lack of a specific and precise single process for calculation. To address these challenges, Andersen (2003) introduced realized volatility, a method capable of calculating volatility for intraday trading data with high frequency. Realized volatility represents the magnitude of changes occurring in prices throughout the day, irrespective of the direction of change, over a specific period. More precisely, it can be described as the logarithm of the standard deviation of the daily return of an asset or share during a given period.

In this research, the statistical population includes the Tehran Stock Exchange and Iran Farabourse. From the shares listed on these exchanges over the three-year period from the beginning of 2017 to the end of 2019, shares were selected based on being active on at least 75% of working days and having traded on them. Consequently, 500 shares were chosen from all available shares.

The selected shares were then categorized and decimated according to the criteria of average daily transaction volume, ranging from the highest average volume to the lowest. Finally, four shares were randomly chosen as representatives from each of the 50 available deciles. This process resulted in a research sample of 40 shares.

RESULTS AND DISCUSSION

The research results indicate a significant relationship between the difference in the number of orders and actualized fluctuations, both in 5 and 10-minute intervals, as well as in positive and negative actualized fluctuations. Simply put, as the difference between the number of buy orders and sell orders increases (or decreases), stock price fluctuations also increase (or decrease). Additionally, regression analyses related to actualize negative fluctuations reveal a positive and significant relationship between the numbers of sell orders and actualized negative fluctuations. Similarly, a positive and significant relationship is observed between the numbers of purchase orders and realized positive fluctuations.

In conclusion, it is evident that the number of orders, among other factors, plays a significant role in stock fluctuations and should not be overlooked. Changes in the volume and nature of orders can indeed influence the creation of fluctuations in various directions.

CONCLUSION

Volatility in financial markets is a crucial variable influencing investment decisions, securities and derivatives pricing, risk management, regulation, and monetary policy. Additionally, the volatility of financial markets plays a vital role in shaping public confidence, thereby impacting the broader economy.

This paper explores the relationship between order imbalance and stock price volatility. Order imbalance is defined as the difference between the numbers of buy and sell orders, as well as their respective volumes. To gauge this volatility, we extract 5-minute and 10-minute intraday data and calculate realized volatility. Our research sample comprises listed companies on the Tehran Stock Exchange and Iran Fara Bourse from 2018 to 2020. The research model is examined using panel regression.

Our findings reveal a significant relationship between order imbalance and realized volatility. Furthermore, we observe that the impact of the number of buy/sell orders on good/bad volatility is asymmetric.

Keywords: Realized Volatility, Order Imbalance, Number of Buy/Sell Order, OrderBook.

JEL Classification: G17, G23.