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Trading breaks and asymmetric information: The option markets ☆

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ABSTRACT

We find that weekend, holiday and overnight trading breaks generate excessive perceived risk in the option markets, presumably due to asymmetric information, which, in turn, encourages uninformed option traders to postpone trading. This perceived risk subsides after two days accompanied by an increase in the option trading volume and the underlying index's actual price volatility. These results shed light on the informational role of index options and suggest that the theoretical models' results regarding information processing and price discovery in the presence of private information are not limited to single stocks but also apply to the market as a whole.

1. Introduction

Numerous studies have shown that trading breaks systematically affect stock price volatility and the volume of trade. In this study, we extend the analysis to the option market and focus on the effect of trading breaks on the perceived risk as measured by the implied volatility. Specifically, we analyze the index options in eight markets rather than the underlying asset (the index) and explore the effect of trading breaks on the interday and intraday *ex ante* perceived risk. We report on the significant association between the flow of information, price discovery and perceived risk, which is a global phenomenon. The interruption to the flow of information during trading breaks may result in a situation with asymmetric information, which generates excessive perceived risk that, in turn, encourages uninformed option traders to postpone trading. When the flow of information resumes, presumably less asymmetric information prevails, the volume of trade increases and the excessive perceived risk subsides in two days. These results shed light on the informational role of index options and suggest that the results of the seminal theoretical models of Foster and Viswanathan (1990), Back (1993) and Easley et al. (1998) regarding information processing and price discovery in the presence of private information are not limited to single stocks but are also relevant to the market as a whole.

Fig. 1 illustrates the highlights of the study's main results. Fig. 1a presents the average change from the previous day in the volatility index (VIX), which corresponds to the S&P 500 implied volatility (perceived risk). The average VIX jumps on Monday, in particularly at market opening, and decreases thereafter. Note that the daily changes in the figure are $\sqrt{365} = 19.1$ times larger in annual terms. The average change in option trading volume, presented in Fig. 1b, reveals the opposite pattern, whereby it falls on Monday and then increases until Thursday. A similar opposite pattern is observed in the average change in actual price volatility, presented in Fig. 1c, and the macroeconomic news index corresponding to 52 U.S. major macroeconomic indicators.

Fig. 1 presents the main results of this paper in a nutshell: it reveals the systematic pattern of the perceived risk, which is the opposite shape to that of the option trading volume, the underlying asset's actual volatility and the macroeconomic news index. In the more rigorous statistical analysis, we show that this effect relates

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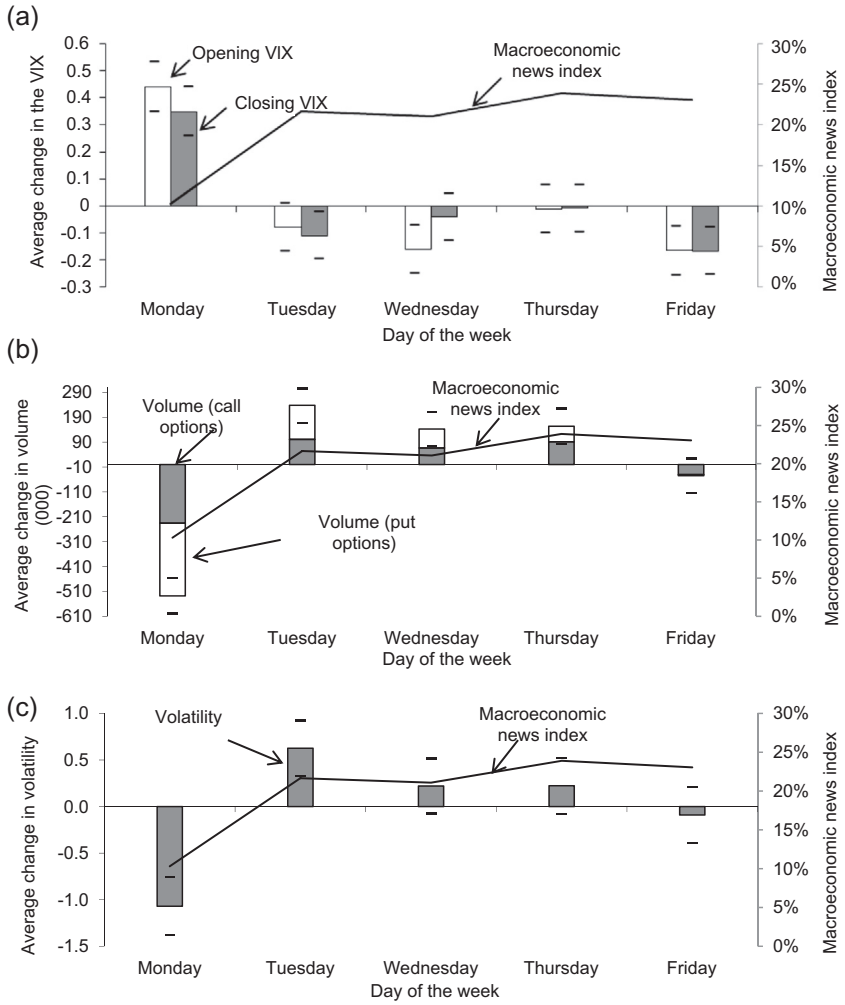

Fig. 1. Average daily change in VIX, volume and actual volatility as a function of the day of the week. The figures present the average change from the previous day in the VIX at market opening and market closing (a), the volume of traded options in the CBOE (b) and high-frequency actual volatility (c) as a function of the day of the week. The macroeconomic news index is the daily percentage of news announcements regarding 52 major U.S. macroeconomic indicators. The dash signs mark 95% confidence intervals. The VIX and volatility data start in January 1992 and end in December 2014 while the volume data start in October 2003.

to the weekend trading break and also exists after holiday and overnight trading breaks. The effect exists in eight foreign markets in which the holidays occur on different days of the year. Thus, the trading break effect is a robust phenomenon.

The empirical evidence rejects the possibility that the effect is induced by a bias in measuring the perceived risk from options. This includes the non-trading days' bias (French and Roll, 1986), the option expiration bias (e.g. Stivers and Sun, 2013), any local market bias and other possible methodological biases. Therefore, we suggest that the effect is due to asymmetric information, which is accumulated over the trading breaks. Fig. 1 also illustrates the dynamic of the process by which the private information accumulated over the trading break is impounded by prices when the flow of information resumes.

Several empirical results support the information flow hypothesis. First, we find that the longer the trading break, the longer the time for which excessive perceived risk prevails, which is in line with Foster and Viswanathan (1990) and others, asserting that a longer trading break is accompanied by more private information and a greater advantage for informed traders. Second, the emergence of volatility futures has mitigated the trading break effect on perceived risk. This result supports the hypothesis that futures reduce the perceived risk of uninformed traders by allowing them to hedge against private information. Finally, the option volume and actual volatility are lowest on Mondays and tend to increase over the week until Thursday. This pattern is in line with the predictions of Foster and Viswanathan's (1990) model. According to their model, informed traders will carry information forward only if it can be used more effectively in future trading; hence, some trades will be postponed on Monday but executed before Friday as all information becomes public on Friday. Thus, we show that the models of Foster and Viswanathan (1990), Back (1993) and Easley et al. (1998) as well as the results of French and Roll (1986) regarding trading when asymmetric information prevails are not limited to single stocks but also apply to index options and the market as a whole and that this is a global phenomenon.

The structure of this paper is as follows: Section 2 presents the background and a brief literature review; Section 3 presents the data and methodology; Section 4 reports the trading break effect and explores the potential mechanical and technical explanations for the effect; Section 5 explores information processing as a plausible explanation; and Section 6 concludes. Some technical tests are relegated to the Appendix.