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# Order flow dynamics around extreme price changes on an emerging stock market

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### Abstract

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We study the dynamics of order flows around large intraday price changes using ultra-high frequency data from the Shenzhen Stock Exchange. We find a significant reversal of price for both intraday price decreases and increases with a permanent price impact. The volatility, the volume of different types of orders, the bid-ask spread and the volume imbalance increase before the

extreme events and decay slowly as a power law, which forms a well-established peak. The volume of buy market orders increases faster and the corresponding peak appears earlier than for sell market orders around positive events, while the volume peak of sell market orders leads buy market orders in the magnitude and time around negative events. When orders are divided into four groups according to their aggressiveness, we find that the behaviors of order volume and order number are similar, except for buy limit orders and canceled orders that the peak of order number postpones 2 min later after the peak of order volume, implying that investors placing large orders are more informed and play a central role in large price fluctuations. We also study the relative rates of different types of orders and find differences in the dynamics of relative rates between buy orders and sell orders and between individual investors and institutional investors. There is evidence that institutions behave very differently from individuals and that they have more aggressive strategies. Combining these findings, we conclude that institutional investors are better informed and play a more influential role in driving large price fluctuations.

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