Effects of Single Stock Circuit Breakers on Market Quality

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1. Introduction

- A circuit breaker is a mechanism employed to suspend trading temporarily in sudden, deep price falls and rises.
- Effective February 2, 2012, The Investment Industry Regulatory Organization of Canada (IIROC) has implemented single stock circuit breakers (SSCBs) to ensure "fair and orderly" market by:
  - preventing extreme volatility (drastic rise and decline) in stock prices by giving investors more time to evaluate market information.
  - reducing volatility driven by uninformed (noise) traders.
  - protecting markets from periods of extreme illiquidity caused by uncertainty.
  - preventing disruptive or erroneous orders in fully automated environments.

2. Circuit Breaker Mechanism

- The SSCB is triggered when the price of a security swings 10% or more within 5 minutes, that is, it restricts both upside and downside movements. Once triggered, the trading of the security is halted for five minutes.

3. Objectives and practical contributions

- This study aims to investigate the effects of changing regulations on the performance and efficiency of securities markets.
- Policy makers and general public will have first-hand evidence concerning fundamental questions such as:
  - Does the single stock circuit breaker approach accomplish desired results in stabilizing Canadian markets and enhancing pricing efficiency?
  - Are the circuit breaker limits in Canada set appropriately?
  - Would the markets perform better if price limits were to be removed?
  - Can the circuit breakers identify market manipulators?

4. Data and Methodology

- Sample Period: January 1, 2007 to December 31, 2016
- The final sample includes stock returns of 1640 companies and 1,249,726 stock-day observations from trade on Toronto Stock Exchange.
- The daily single stock circuit breaker records from Investment Industry Regulatory Organization of Canada (IIROC),
- Event study analyses
  - Short term AARs and CAARs around SSCB trading halts are investigated using the market model with GARCH (1,1).
  - Market Quality Analyses: Difference-in-Difference model to estimate the impact of the SSCB on overall market quality.
  - several intraday volatility and liquidity measures are used to avoid possible measurement biases.

5. Price Discovery Results using Event Study Methodology

- Average abnormal returns around the event date

6. Market Quality Results using Difference in difference test

- Pooled regressions including firm fixed effect

\[ \text{Perf}_{i,t} = a + b_1 \text{Treatment}_{i,t} + b_2 \text{SSCB}_{i} + (b_1 \times \text{SSCB}_{i}) + u_{i,t} \]
- \( \text{Treatment}_{i,t} \): Intraday decline and Intraday ascension as proxies of volatility. Turnover as proxy of liquidity
- \( \text{Treatment}_{i,t} = 1 \) if the stock \( i \) is subject to the SSCB, at time \( t \), 0 otherwise.
- \( \text{SSCB} = 1 \) if the date \( t \) is in the post-breaker period and 0 otherwise.

<table>
<thead>
<tr>
<th>Intraday</th>
<th>Coefficient</th>
<th>Rob Std Err</th>
<th>t-stat</th>
<th>p-value</th>
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<tr>
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</tbody>
</table>

7. Conclusions

- The material information that caused the circuit breaker induced trading halt is incorporated in stock prices on the day of the halt.
- Evidence supporting enhanced price discovery
- The implementation of SSCB improves market quality by reducing intraday volatility of the stock market.
- SSCB’s effect on improving market liquidity is insignificant

8. Work in Progress using Intraday Data

- Event period: (-20, 20) minutes around the trading halts.
- Market Quality measures:
  - Trading activity: number of trades, volume of trades
  - Liquidity: quoted, relative and effective spreads
  - Short-term volatility: (high-low)/high mid-quotes in a 1-min interval.
- Research Questions:
  - How do the SSCB halts affect different measures of market quality?
  - Are there any differences between pre-halt and post-halt market quality between no-news and news related trading halts?