Circuit Breakers and Market Runs

Discussion

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Summary

- The paper analyzes whether the application of a circuit breaker (CB) to a trading venue reaches its intended goals of increased market stability and overall welfare.
  - CB is defined as a mechanism that interrupts trading for a predetermined period when the price moves beyond a predetermined level.
- Its setting is the financial market translation of the seminal model of bank runs developed by Diamond and Dybvig (1983) in the spirit of Bernardo and Welch (2004).
- The effectiveness of the CB depends on two factors.
  - How the price limit at which trading is interrupted is defined relative to the price impact traders incur upon selling.
  - The expected loss due to the possibility of a liquidity shock.
- The paper shows under which conditions CBs increase social welfare.

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Contribution to the theoretical literature

- The paper deals with a very interesting and timely topic in financial market design.
- It contributes to a stream of the theoretical literature which is still limited and quite controversial.
- Opponents of CB contend that mandated trading halts interrupt the natural movement of security prices and introduce unnecessary and artificial barriers.
  - Subrahmanyam (1994, 1995) argues that CB may raise price variability by forcing agents to advance their trades before trading is halted (magnet effect). Furthermore, with two markets, volatility increases and liquidity decreases when a CB is triggered in the more liquid market. Subrahmanyam (1997) also suggests that informed traders may reduce their trading in anticipation of a trading halt resulting in higher trading costs for small investors.
- Other theoretical evidence suggests that CB can be beneficial by tempering unwarranted price increases through a "cooling off period."
  - Greenwald and Stein (1991) argue that CB reduce transactions risk that arises due to uncertainty about execution price.

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Insights from the empirical evidence

- The empirical literature on both market-wide CB and other forms of trading restrictions (e.g., firm-specific trading halts also called price limits) does not solve the ambiguity of theoretical models.
  - Numerous empirical challenges: security prices and associated volatility change for many reasons, including macroeconomic factors and investor sentiment; various types of mechanisms; differences in rule specifications across international markets; diversity in theoretical assumptions and empirical measures; difficulty in control for confounding events.
  - Market-wide CB: price adjustment can be smoothed, volatility may not be curbed; liquidity drains may occur (Lauterbach and Ben-Zion, 1993; Santoni and Liu, 1993; Goldstein and Kavajecz, 2004).
  - Firm-specific trading halts: trading restrictions may reduce volatility (Ma, Rao, and Sears, 1989a;1989b; Lee and Kim,1995; Kim and Yang, 2008); others conclude that volatility increases (Lee, Ready, Seguin, 1994; Bildik and Gulay, 2006); others find little long run effect on market outcomes (Overdahl and McMillan, 1998).
- Another issue investigated by the empirical literature is fragmentation.
  - Different results for the US and the European market systems (among the others, Fabozzi and Ma, 1988, and Gomber et al., 2013).

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Policy implications and possible extensions – 1

- According to the results of the paper, the CB limit should be optimally set as a function of the individual characteristics of the assets and the characteristics of the aggregate shock which may hit the traders.
- The key elements are the probability of a liquidity shock, the risky asset payoff variance and the risk aversion parameter (market liquidity)

- The probability of a liquidity shock: in the model it is exogenous and common knowledge.
- What happens if it is endogenous, either driven by self-fulfilling expectations or by cascade trades triggered by HFTr?
  - Ex post versus ex ante CB (halting trading before accumulated orders are executed),
- What happens if information asymmetries among informed and uninformed traders are introduced?
- What happens if we move to continuous time?

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Policy implications and possible extensions – 2

- The hypotheses of constant variance of the risky payoff asset and constant risk aversion may not hold in stressed financial market conditions.
- Both volatility and risk aversion may change. Contagion phenomenon may lead to a change in the realization of the "states" of the world.
- A possible extension could be to model switches between periods of high volatility and low volatility of asset returns through a regime-switching model (Roger, 1968; Turner et al., 1989; Coe, 2002).

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Coordination issue

- CB and market fragmentation: CB in various forms are already implemented for individual markets. Different markets can find different CB policies optimal but in times of overall stress there is a need of coordination, both along the cross market side (main markets halt trading but stock prices continue to decline as traders eventually migrate to alternative markets) and the cross asset side (impact on hedging).

- Further investigation is needed to understand how coordination could be best achieved.

- Gomber et al. (2013) empirically study the impact of CB in the European trading landscape, a fragmented market context.
  - They find a decline in market volatility after the CB, but at the cost of higher implicit trading costs. By analyzing trading at the satellite market during the home markets CB, they find market quality and price discovery to be sorely afflicted as traders systematically retreat from trading. Only with the home market reentering trading, the satellite market restores pre-CB market conditions.

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Implementation of CB by major European exchanges

- The CB implemented by the EU primary regulated markets fall into two broad categories:
  - threshold/reference prices: a volatility band (either symmetric or asymmetric) is established for each instrument (or index), each liquidity class and asset class.
  - Halt/auction and duration: when a CB is triggered, the trading system faces either a halt or a system change into auction phase (if triggered in countinuous trading).
- Some exchanges do not publish the price thresholds or the duration; sometimes the duration extension is randomised (unpredictability of the trigger points).
- The three major European Multilateral trading facilities (MTFs), Chi-X, BATS and Turquoise, do not implement any coordination with the regulated markets. In fact only Chi-X Rulebook clearly states that "*it will not normally suspend trading in any security which is subject to any non-regulatory suspensions, such as a volatility halt*" (Gomber et al., 2013).

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The European regulatory framework

- The European regulatory bodies so far did not set up common standards to implement CBs as well as a possible coordination.
  - Implemented CBs reveal systematic differences.
  - No coordination role is acknowledged to ESMA.
    - The European regulation on short selling gave ESMA the power to coordinate the actions of the national competent Authorities by assessing the emergency measures one national Authority is proposing to take and considering whether it should be expanded to other jurisdictions.
- The MiFID review process, while requiring the implementation of CBs, …
  - Member states should assure regulated markets to have in place effective systems *"to reject orders that exceed pre-determined volume and price thresholds or are clearly erroneous and to be able to temporarily halt trading if there is a significant price movement in a financial instrument on that market or a related market during a short period and, in exceptional cases, to be able to cancel, vary or correct any transaction"* (European Commission, 2011)
- … still does not address market-wide coordination mechanisms.

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CB in Italy

- The number of halts per day shot up during market stress induced by the sovereign debt crisis, especially for banks' instruments.
- Fragmentation is not an issue at the moment.