

Implications of the “Flash Crash” for Indian securities regulation

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The event

- Date: May 6th 2010.
- Times:
 - ① 2:42pm – 2:47pm, the Dow Jones index dropped by “600 points”.
At that level, it would have meant a market drop of 9.2%.
 - ② 2:47pm – 3:07pm, the Dow Jones index recovered the previous 5-minute loss. It was as if the drop never happened.
- At market close: Dow Jones Industrial Average was down 3.2% compared with the previous day close.
(All the market indices: DJIA, S&P500, NASDAQ100 reached their lowest of the day between 2:45pm and 2:47pm.)

Other market indicators: VIX

- VIX started the day at 22%.
- It was the time of the Greek debt crisis.
By 2:30pm: VIX up by 22.5% (27%).
- 2:47pm: VIX reached 40%
- Market close: VIX at 29%.

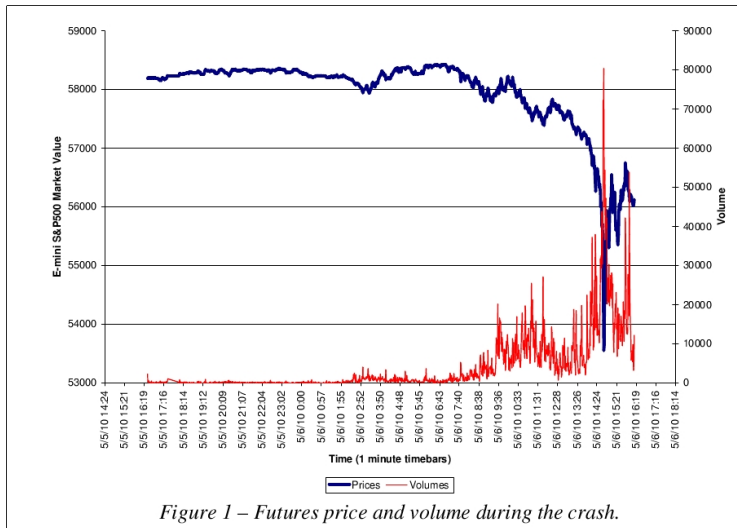
Other market indicators: E-mini S&P500 futures

- E-mini S&P500 futures market is considered a lead-indicator for the broad market movement.
- Buy-side in the liquidity (available market depth) had dropped by 55%.
This was a change in depth from USD 6 billion to USD 2.6 billion.
- At 2:30pm: E-mini S&P500 futures price had dropped by 5%.
- 2:30pm – 3:00pm: E-mini futures traded volume > 1.1 million contracts.
- 2:45pm: CME Globex systems triggered a circuit breaker in E-mini futures trading.
Drop continued after trading opened. But the price started moving up almost immediately.
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Source: “The microstructure of the Flash Crash”, Easley, dePrado, O’Hara, 2010.

Other market indicators: single stocks

- Several single stocks went through their own personal flash crashes.
Range of price drops between 4% to 90%.
- All of them recovered before market close.
- Some exchanges (like the NYSE) closed market during the extreme price movements and did not have trades at the extreme price points.
(Point of contention across different trading venues: non-standardised trading rules lead to different customer trades.)

Outcomes of the event

- The exchanges cancelled trades done at “sharply divergent” prices – a significant number of them in shares of ETFs.
- A lot of media coverage, calling to understand the cause of the dramatic change in such a short time. Subsequently, a lot of hostile statements from politicians.
- Effort by the regulators (SEC/CFTC) to understand what caused the flash crash.
- Regulatory focus on:
 - 1 Identifying whether there was a clear cause.
 - 2 Identifying market structure at the exchanges that may have been at fault.
 - 3 How to improve the market design.

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- **Fragmented markets,**
- Non-standardised trading rules,
- Algorithmic trading, leading to
 - Low latency trading focus,
- Lack of market makers – capital that is capable of taking on inventory risk,
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The context of the US market

US Equity Markets: trading systems

- Large exchanges with mostly electronic trading platforms.
- Next came “Alternative Trading Systems” (ATS) are prolific and co-exist with exchanges.
ATS have a generic focus on immediacy of execution, irrespective of the size of the trade. Two distinct categories:
 - 1 Electronic Communication Networks (ECN): anonymous orders, visible to members of the ECN.
 - 2 Crossing networks: anonymous orders, no visibility to the members.
- State-of-the-art in trading systems today: electronic/algorithmic trading systems that act as “liquidity aggregators” across all ATS.

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US Equity Markets: ECNs

- ECNs came up in the 1990s from the need large deals, anonymously and efficiently.
- These were the original alternative trading systems (for “after-hours” trading) with institutional investors and broker-dealers in the equity markets.
- From the middle of 1999, ECNs offered access to retail orders as well.
Today, ECNs
- ECNs display their orders as limit order books to their members, as well as to other information sources.

US Equity Markets: CNs

- CN members are informed about orders that arrive.
- Either the order gets executed. If not, the order typically gets routed to the exchange.
- CNs are referred to as the “dark pools of liquidity” because the liquidity they contain is not visible to any market participant.

US Equity Markets: history of regulations

- 1975 Amendment to Securities Exchange Act, 1934 proposed: “National Market System”.
 - Mandatory posting (by exchanges and dealers) of both bid-ask quotes and the last traded price.
 - The information about prices and liquidity to be available from all exchanges.
 - Broker dealers obligated to get the best execution for customers.

US Equity Markets: history of regulations

- The 1990's saw a significant growth of ECNs. Market makers started putting better orders on the ECNs.
- 1996, SEC adopted "Order Handling Rules": market makers had to disclose their ECN quotes to exchanges and customers. Customer quotes better than public (exchange) market maker quotes had to be executed first.
- Order handling rules did not apply to
 - 1 ECNs
 - 2 Institutional/non-market-maker orders.

US Equity Markets: history of regulations

- 1998, Regulation ATS: ECNs had to choose to either become
 - ① Broker members of an exchange, or
 - ② A registered exchange
- 2005, SEC adopted Regulation NMS: specifies details on crossing orders that originated in different trading venues.

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US regulatory reaction to the Flash Crash

- Diagnosis on operational details.
- No one seems to be asking:
 - Who got hurt during the flash crash, and who benefitted?
 - Who benefitted from the “flash fixes”?
 - How did the flash crash impact market quality?

Issues that we may want to focus on

What SEBI needs to ponder

- Significant difference in market fragmentation in the US and Indian equity markets.
- A lot of the market structure changes the SEC has recommended is already in place here?
- There are basically only 2 major market venues in India - NSE and BSE. (But even in this, there seems to be inadequate arbitrage capital).
- So what do we have to worry about? Not our problem?

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Episodic systemic liquidity risk

- The U.S. May 6th flash crash is an extreme kind of systemic liquidity risk.
It is remarkable how quickly the liquidity reverted to normal.
- Systemic liquidity risk is a feature of all markets.

The really important question, for us

- If, for any reason, liquidity suddenly collapses, what are the forces which bring prices and liquidity back to normal?
- For instance, if the gap between buy and sell depth in the Nifty futures market **is** an early warning indicator of impending systemic liquidity crisis, how should we respond?
 - Should we take any action at all?
 - What action can be taken?
 - Who makes the call? Exchanges? Regulator?

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Create systems of persistent liquidity provision

- We need to deal with how to ensure “persistence” of liquidity.
- For instance, how do we get “persistent liquidity”
 - For the naturally illiquid stocks?
 - During moments of high macro-volatility?
 - During moments of high macro-volatility and high liquidity risk (like when the market is getting close to end of trading hours)?

Some conjectures about what would help

- More algorithmic trading that “aggregate” liquidity quickly.
- More intelligent capital that can be deployed into arbitrage
 - - 1 E.g. MF schemes which will do arbitrage
 - 2 E.g. More hedge funds
- Can PMS grow into domestic hedge funds?

The need for research

- NSE and BSE are now massive datasets that require study.
- There are many little dramas taking place in the intra-day data all the time.
- These need to be analysed, first as anecdotes, and then as systematic empirical regularities
- E.g. what happened when someone typed a wrong order for Reliance on BSE?
- Policy initiatives require post-mortem data analysis. E.g. call auctions?
- The fields of market microstructure and high-frequency finance matter.

Thank you.

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