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.)
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.
- 2:30pm – 2:50pm: A significant swing in the trade imbalance at the sell vs. the buy compared to the previous periods in the day.
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Figure 1 – Futures price and volume during the crash.

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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Factors apparently causing systemic volatility

- 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,
- Macro uncertainty
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The context of the US market
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/algorithimic trading systems that act as “liquidity aggregators” across all ATS.
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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.
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.

- Mandatory posting (by exchanges and dealers) of both bid-ask quotes and the last traded price.
- The information about prices and liquidity to available from all exchanges.
- Broker dealers obligated to get the best execution for customers.
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.
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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).
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The U.S. May 6\textsuperscript{th} 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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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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