Will the Real Market Failure Please Stand Up?

Chairman Schapiro on September 7
- The Flash Crash is “clearly a market failure”

An Internet search produces 767,000 references to market failure
- A condition that arises when unrestrained operation of markets yields socially undesirable results

The story that was (and to some extent still is) being crafted
- Market structure itself is the real market failure

Why does the Flash Crash live on?
- It has changed the entire tenor of the regulatory debate concerning market structure and behavior as conditioned by structure
- The Flash Crash is used as motivation multiple times in an address by Chairman Schapiro as late as March 23 of this year
The Flash Crash of May 28

A bad morning

The market drops sharply in the afternoon, then rebounds

Many stocks decline by over nine percent in less than 12 minutes

Full investigation, but the cause remains undetermined

What did market structure look like?

What was the role of market makers, and how did they react?

How did market and stop-loss orders play into the crash?

Speed, speed and more of the same…

Investor behavior and changes in the impact of normal market mechanisms, with an eye towards fair and orderly markets

Price discovery
ETF Volatility

Market Plunge on May 6, 2010: 14:40 - 15:00

Average 15 Second Midquote Volatility

6-May
7-May
Avg 5/3-5/5
Message Traffic Signals

Market Plunge on May 6, 2010: 14:40 - 15:00

Average 15 Second Buy Limit Order Cancellations / Modifications
What Order Flow Went Along with the Message Traffic?

Market Plunge on May 6, 2010: 14:40 - 15:00

Average 15 Second Number of Fleeting Orders

Number of Fleeting Orders
A Lagging Indicator of Liquidity Provision

Market Plunge on May 6, 2010: 14:40 - 15:00
Average 15 Second TWA Spread

TWA Spread (in bps)

Avg 5/3-5/5  6-May  7-May
ETF Depth at the Top of the Book

Market Plunge on May 6, 2010: 14:40 - 15:00

Average 15 Second Bid Depth Sizes

Average Bid Depth Size (in shares)


Avg 5/3-5/5 6-May 7-May
ETF Depth Across Ten Price Levels

Market Plunge on May 6, 2010: 14:40 - 15:00

Average 15 Second TWA Bid Depth Size Up to Level 10
S&P 500 Growth Index Fund

IVW Vs. Portfolio: Bid Depth Level 1

Cumulative Return Pct.

Ind IVW Bid_1  Ind Portfolio Bid_1  IVW CumRet  Portfolio CumRet
S&P 500 Growth Index Fund

IVW Vs. Portfolio: Bid Depth Level 1-10

Liquidity - Ask_Depth_Level 1 Index Change

Cumulative Return Pct.

-80 -70 -60 -50 -40 -30 -20 -10 0

Ind IVW Bid_10  Ind Portfolio Bid_10  IVW CumRet  Portfolio CumRet
ETFs with Broken Trades

Affected ETF's Vs. Aggregated Portfolio:
Ask Depth Level 1-10

Liquidity - Bid_Depth_Level 1-10 Index Change

Cumulative Return Pct.

-70 -60 -50 -40 -30 -20 -10 0


Index-AffectedETF's-Ask Depth10
Index-Affected Portfolio-Ask Depth10
AffectedETF's-CumRet
Affected Portfolio-CumRet
ETFs without Trade Breaks

Unaffected ETF's Vs. Aggregated Portfolio:
Ask Depth Level 1-10

Liquidity - Bid_Depth_Level 1-10 Index

Change

Cumulative Return Pct.
Was the Liquidity Issue Limited to ETFs?

The bulk of the final SEC report is summarized by a few quotes

• “the largest and most erratic price moves were caused by withdrawals of liquidity and the subsequent execution of trades at stub quotes”

• “liquidity had virtually evaporated” (repeated in different contexts)

• “drops in price become increasingly more severe with ever-larger drops in liquidity”

• All in all, “what happened is best described in terms of two liquidity crises—one at the broad index level in the E-Mini, the other with respect to individual stocks”

From market structure to behavior, and onwards to algorithms
2:32 ET on May 6

An unpriced order was submitted to a volume participation algorithm.

35,000 contracts sold as the contract went from 1130 to 1056.

Five second pause by the CME.

Futures go back to previous level.

40,000 more contracts sold.

Total elapsed time: 20 minutes.
Volume Participation, Volatility, and Size

**Volume Participation strategy**

Strategy-specific cost (bps) vs. intraday volatility (%)

**Strategy conditional impact vs. intraday volatility**
(relative order size set to the mean)

Relative conditional impact (bps) vs. intraday volatility (%)
Participation Algorithms for Small Orders

Cost Distribution for Scheduled Strategies:
MDV=0-1% / Volatility = Low

Cost Distribution for Scheduled Strategies:
MDV=0-1% / Volatility = High

Cost vs Benchmark (BPS)

- Participation
- VWAP

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Participation Algorithms for Large Orders

Cost Distribution for Scheduled Strategies:
MDV=5-10% / Volatility = Low

Cost Distribution for Scheduled Strategies:
MDV=5-10% / Volatility = High
If We Have Time for the Regulators…

Regulation of trading strategies
Stub Quotes
Regulatory Constraints on Brokers
Enhanced Data Transparency
Circuit Breakers
Automated Review Policies
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