

The “Flash Crash” of May 6: Causes, Consequences and Cures

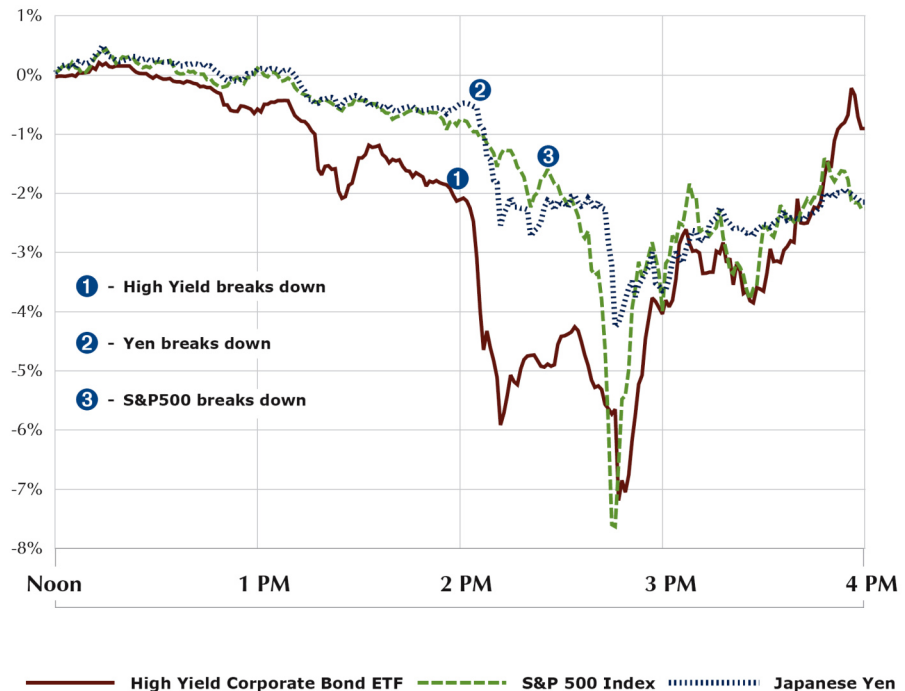
The US stock market action of May 6 is likely to be the topic of conversation for some time to come. While there is still a great deal of speculation and finger pointing about the actual trigger of the huge market sell-off, including among other things “fat-fingered” trades and forced selling, one thing is clear – The market plunge of May 6 exposed structural flaws within the US trading markets that should be of interest and concern to all market participants. Dragan Skoko, Batterymarch’s Director of Trading, discusses how regulatory and technological advancements over the past decade had a hand in the steep decline of May 6.

A Confluence of Events

The extreme market action of May 6, which wreaked havoc across asset classes, was likely caused by a confluence of events rather than any single event:

- The accelerated sell-off, which first took place in the High Yield Bond market, prompted correlation and arbitrage traders to take action across other asset classes (foreign exchange (FX), equities, etc.)
- US Equities lost 1% between 2:00 and 2:30 pm, while the FX markets experienced extremely violent moves starting around 2:15 pm

May 6, 2010 – Cumulative One-Minute Returns



Source: Bloomberg

- After several months of relative stability followed by three straight days of selling pressure, indices quickly approached major technical support levels, all of which were in close proximity to each other
- Stop-loss orders in futures markets (S&P 500 and other stock index futures), were triggered as the markets approached major technical support levels
- Statistical Arbitrage traders (ETF / Futures / Equity baskets) started selling equity baskets to de-lever their risk
- Market makers quickly stepped aside as they approached their VaR (Value at Risk) limits
- Long only asset managers paused all trading activities
- High Frequency Traders (which account for approximately 50-60% of all trading volume) pulled liquidity out of the market when they exited the market for several minutes
- Trading venues failed to gain access to each other's liquidity

The sudden deleveraging and lack of participants who were able and willing to provide liquidity amplified the move. Once the stops were cleared, selling subsided and buyers moved back in.

Our belief is that the structural issues that were exposed during the dramatic decline of May 6 are far more important to the future of trading than the actual triggers. With financial reform regulation gaining momentum in Washington, it becomes imperative that legislators focus on the right issues – not just the expedient ones.

Major Structural Changes from Regulation and Technological Advances

What became apparent on May 6 is how much the regulatory and technological changes over the past decade (and particularly over the last three years) that were intended to make markets more efficient and cheaper for end users have, in fact, had unintended consequences that serve to challenge the stability of the system they were designed to protect.

The implementation of several regulatory changes within the last decade — such as Reg ATS (Alternative Trading System) in 1998, Decimalization in 2001, and Reg NMS (National Market System) in 2007 — along with massive technological improvements have had a profound effect on the overall market structure. The competition between the brokers, exchanges and Electronic Communications Networks (ECNs) has lowered the fixed costs; average trade size has been drastically reduced, while overall trading volumes and the frequency of quote updates have exploded.

These advancements have caused unintentional structural shortcomings that were laid bare during the May 6 market decline. The structure of the current trading environment has become increasingly complex. These complexities, along with the speed at which trading now takes place, has made navigation difficult even for some of the industry's most sophisticated traders. Compounding these complexities has been the changing role of the market makers. Traditional market makers of old were mandated to provide two-way liquidity for the markets. They have been replaced by new market makers in the form of High Frequency Traders (HFTs), who can provide access to liquidity at much lower costs than their earlier, more conventional counterparts. However, they do so selectively and at much greater speeds than their predecessors.

The recent proliferation of trading venues has added further complexity. Many of the newer electronic trading venues do not have circuit breakers that cause the markets to pause and allow for price discovery during market extremes. By contrast, the NYSE, which accounts for roughly 30% of average daily trade volume in the US markets, uses a hybrid model that allows the exchange to slow down trading during periods of extreme volatility. This speed incompatibility between venues, both allows and forces other trading venues to by-pass the NYSE's liquidity. Under the self-help rule within Reg NMS, market participants are allowed to by-pass the venue offering the best quote if that venue does not respond within a very short period of time by declaring "self-help" against that venue. On May 6, during the steepest part of the decline, the NYSE slowed trading to get better price discovery. In doing so, it allowed the CBOE, NASDAQ and BATS to declare self-help against the NYSE, which pulled a major source of liquidity away from the market.

Our belief is that, in combination, these major structural changes and technological advances challenge the stability of the current US market structure.

As illustrated by the May 6 stress-test of the markets, these factors can prompt steep declines to develop over a period of minutes, rather than hours. Without the time needed for human intervention to take place and aid the price discovery process, liquidity rapidly drained out of the markets for a period of several minutes. The HFTs pulled their bids during the market's steepest decline, while the smart order routers bypassed the NYSE, an action that served to exacerbate the market action. In short, the humans supervising the trading systems and execution strategies could not process the information quickly enough to take preventive action, while the black box systems failed to deliver a reasonable price discovery process.

In order to address the perception of unfair treatment to some investors, the exchanges decided to cancel trades that were more than 60% away from the last sale prior to the start of the disruption at 2:40. In doing so, however, they created uncertainty around how the decision was made and how investors should respond to large price swings in the future. This will have implications for exchange stability and price discovery unless the rules are made clear.

The Way Forward

As quantitative investors, we certainly appreciate the power and efficiencies that automation can bring to any process. However, we also understand its inherent dangers. Automated processes, left to run on their own, without the benefit of human oversight and experience, can fail when pushed to abnormal or extreme conditions. One of the core reasons that Batterymarch has a number of manual reviews within both our trading and investment processes is to ensure that we understand the drivers behind our process and can better manage the process when those drivers move to extremes.

Batterymarch's trading desk implements tight risk controls, which greatly reduce the likelihood of executing orders outside of pre-specified price levels. Our traders were able to pause, re-assess the situation and re-engage in trade execution once the markets stabilized. However, the stress of the May 6 market activity leaves us convinced that some level of regulatory action is justified to ensure better stability of the market structure during the most volatile situations.

We believe that there are a number of ways that regulators and exchanges can work together to close the structural gaps that were exposed. These include but are not limited to:

- Implementing circuit breakers for individual stocks
- Implementing methods to slow down trading in the presence of high volatility (this is much like reducing highway speed limits in areas of construction or during inclement weather)
- Mandating that all trading firms co-locating with exchanges provide two-way liquidity to better ensure orderly and balanced markets regardless of environment

- Banning naked access, which allows certain participants such as hedge funds and proprietary trading firms to place orders directly on exchanges through sponsors, to ensure that all market participants are subject to the same pricing, infrastructure and regulations
- Imposing circuit breaks (or up/down limits like those used in commodity futures) on index futures

In the aftermath of May 6, the heads of the major exchanges are coordinating with the SEC and FINRA to develop and implement market-wide circuit breakers to alleviate some of the structural issues discussed in this paper. While we applaud these initial actions, we believe the regulators and exchanges should consider further actions, such as those outlined above, to ensure future market stability while protecting the positive advancements of the last decade.

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