May 26, 2010

Ms. Elizabeth M. Murphy
Secretary Securities and Exchange Commission
100 F Street, N.E.
Washington, DC 20549-1090

RE: File Numbers:
SR-BATS-2010-014 SR-BX-2010-037 SR-NASDAQ-2010-061 SR-NSX-2010-05 SR-NYSE-2010-39 SR-NYSEArca-2010-41 SR-NYSEAmex-2010-46 SR-ISE-2010-48 SR-EDGA-2010-01 SR-EDGX-2010-01 SR-CBOE-2010-047 SR-FINRA-2010-025

Dear Ms. Murphy:

I appreciate the opportunity to comment on the 'Stock-by-Stock Circuit Breaker Rule' that various exchanges recently proposed in response to the events occurring on May 6. I direct my comments to two alternatives: a requirement to price all orders and the proposed rule to halt trading following large price changes.

Priced orders

The Commission surely is aware of the op-ed that I wrote about the May 6 "Flash Crash", published in the *Wall Street Journal* on May 19. A copy of my original final draft appears below. It was cut slightly by the *WSJ* editors to meet their space constraints.

In it, I argued that prohibiting market orders would provide the simplest and cheapest regulatory solution to the problems presented by the Flash Crash. With two caveats, I still believe that prohibiting the submission of market orders to electronic exchanges would be the best solution.

The first caveat involves computerized trading tactics that submit sell limit orders based on prevailing NBBO bids (or buy limit orders based on NBBO offers). If these tactics submit marketable limit orders, they effectively seek to sell (or purchase) at the best available prices, regardless of their levels. Their effect on the market thus is essentially the same as that of market orders which generally must be filled at the best available prices, regardless of their levels.

If these tactics float offers above the NBBO bid (or bids below the NBBO offer), they cannot push prices down (or up), but they allow others to trade at extreme values, which also can be disruptive.

To the best of my knowledge, the software systems that implement these tactics always permit traders to limit the prices that they are willing to accept. These systems stop submitting orders if the best available prices are inferior to the trader-specified limit prices. Accordingly, any prohibition on submitting market orders to market centers also should include a prohibition on submitting market orders to tactics engines that submit sell limit orders based on the NBBO best bid (or buy limit orders based on the NBBO best offer.)

These objectives can accomplished most simply by requiring that brokers only accept priced orders.

Such a requirement in no way prevents traders from trading aggressively. Traders who truly want to submit market sell orders can still submit sell orders limited at zero. Likewise, traders who want to submit market buy orders can still submit buy orders limited at arbitrarily high prices.

A prohibition on market orders also does not prevent traders from using stop orders. Traders seeking to activate their orders based on price conditions can attach stop instructions to limit orders instead of market orders. For example, a security holder at 50 who wants to sell if price drops to 40 but who would not be willing to accept a price below 30 would submit a sell stop 40 limit 30 order.

A requirement to price orders will ensure that traders take responsibility for their trade prices. Such a requirement also will help solve broken trade issues.

The second caveat involves liquidating transactions initiated by brokers when clients fail to maintain margin. Brokers typically use market orders to arrange these trades because they want to ensure that the trades occur as quickly as possible. If brokers could not use market orders, they likely would submit very aggressively priced limit orders instead. Too many of such orders could produce order imbalances that could lead to extreme volatility spikes. Such spikes also can produce margin problems, which creates a positive feedback loop that increases instability.

The liquidating order problem is difficult to address without trade halts. If nothing is done, the problem might occasionally produce extreme volatility. If we prohibit brokers from liquidating at extreme prices, we would have to specify what constitutes an extreme price. An extreme price prohibition could lead to increased losses to brokers if accounts ultimately are liquidated to negative balances. The risk of such losses may cause some brokers to increase margin requirements, which they and their clients would not like, but which many might support.

A well crafted rule would prohibit extremely priced orders if the resulting liquidation would not produce a negative balance. The code necessary to implement such a rule would be relatively easy to implement for any broker who already uses computers to manage client margin risk in real time since such systems are aware of the liquidating values of their client accounts and of the quoted prices of their client's positions.

Note that the liquidating order problem also affects markets that halt following large price changes. Regardless of market structure, forced liquidations impose very inelastic demands on liquidity.

I suspect that liquidating transactions were not a major cause of the order imbalances that produced the Flash Crash. Undoubtedly, Staff presently is considering the extent to which these transactions played a role.

Assuming that liquidating transactions are not a major issue, the requirement that traders price all orders will result in endogenous trade halts whenever order imbalances occur. These halts will occur when standing sell orders are priced above standing buy orders, as is normally the case. The pricing requirement ensures that orders will stand at prices that traders find reasonable if no contra-side liquidity is available. The halts end automatically when liquidity arrives. This system does not require coordination or extensive coding by market centers. The Flash Crash would not have occurred had traders only used limit orders.

Trade halts

The advantages of trade halts are obvious and need little comment. They simply stop markets from moving too quickly on the hope that liquidity or rationality will arrive before they return to operation. My comments are directed to two disadvantages about which many may not be aware. I then conclude with an argument for one-sided trade halts (price limits) instead of timed trade halts.

The first issue is related to the well known question of whether halts attenuate or exacerbate volatility. Halts will attenuate volatility if liquidity or rationality arrives before markets return to operation. But they will exacerbate volatility if traders panic during the halt or if they trade in anticipation of the halt. The empirical evidence on this question is weak and inconclusive because halts due to large price changes have not happened often enough to make even weak empirical inferences, much less strong ones upon which we would hope to base regulatory decisions.

Had the market-wide circuit breaker been tripped on May 6, I believe that the vast majority of traders would have thought that the price drop was due to fundamental valuation issues (European economic problems with implications for American problems) instead of order imbalance issues. In which case, during the period of the halt, the order imbalance could easily have grown much larger as traders drew incorrect inferences from the event. As a result, no intraday recovery might have occurred on May 6, and indeed, a deeper crash might have resulted.

Knowing what would have happened is impossible, but I believe that the probability of a substantial recovery following a 10 percent market-wide circuit breaker halt on that day given the facts then available to most traders would have been less than 50 percent. I therefore take the May 6 incident as a strong warning about the dangers of market-wide trade halts.

With this issue in mind, we must be aware that market data vendors and commentators will keep track of the fraction of stocks halted at any given moment by stock-by-stock circuit breakers. This information will become known as a new fear index. It will be widely published on radio and television, and followed on real-time electronic information systems. The production and dissemination of such an index cannot be good for the markets as it will become a focal point for fearful traders.

The second issue involves competition among market centers. Trade halt rules are anti-competitive because they encourage traders to submit their orders to the dominant exchanges so

that they can participate in the call auctions that restart trading. (Market shares for these exchanges are already higher at the daily open than they are in intraday trading.) Such behavior, of course, solidifies the positions of the dominant exchanges, which is anticompetitive. A decision to implement trade halts thus should be informed by its unintended consequences for competition among market centers.

Finally, note that if the purpose of a trade halt is to attenuate volatility, allowing markets to reverse as soon as they are ready to do so is optimal because such reversals restore confidence. Accordingly, during the period of the trade halt, only trading at prices outside of the price trigger should be halted. Trading at prices that reverse the triggering price change should be permitted. Such one-sided trade halt rules are called price limits, and many futures markets use them.

Conclusion

Like generals who plan to fight the last war, we too often regulate to prevent events that are unlikely to occur again. Traders and market centers learned much from the Flash Crash:

- Liquidity suppliers who turned off their systems regretted the profits that they could have made. They will be more persistent in the future.
- Arca and others will undoubtedly install more system capacity, without which they will have difficulty attracting orders in the future.
- Traders will increasingly price their orders to avoid serious losses in extraordinary conditions.

These observations suggest that the Flash Crash is not likely to reoccur even without further regulation. The fact that only one Flash Crash has occurred to date also suggests that such events may be extremely rare.

With these perspectives in mind, engaging in too much regulation in response to the Flash Crash seems unwise. Regulation is expensive, and it too often has associated with it unintended consequences that are either unanticipated or undervalued. Accordingly, a measured response would seem to be most sensible.

The main problem with the markets on May 6 remains obvious. Too many traders used market orders when trading in electronic systems that may handle market orders quite poorly on very rare occasions. Traders should only use priced orders when trading in electronic order matching systems.

On May 6, the vast majority of market order traders were not aware of how poorly their orders might execute. They surely are now; so are their brokers; and so are regulators. The simplest effective response to the Flash Crash is to require that all traders price their orders.

Although the Flash Crash garnered much attention, it has not had much effect on valuations. Prices have been dropping in response to increasing awareness of fundamental economic problems, not in response to fears about reversing price spikes that the vast majority of investors only learned about in the evening news.

When all is said and done, the Flash Crash was not expensive to the economy, though certainly embarrassing to the markets. If another were to occur following a measured regulatory response such as a prohibition on market orders, we would be disappointed, but not devastated. Moreover, should such a repeat event occur after a prohibition on market orders is in place, the cost of the event would be much less than what we experienced on May 6. At which point, it might be appropriate to adopt trade halts. To do so before we try a simpler and obviously effective remedy would be unwise.

Sincerely,

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A Sensible Regulatory Response to the Flash Crash[1]

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Editor's note: Larry Harris served as Chief Economist of the US Securities and Exchange Commission, 2002-2004. He is the author of *Trading and Exchanges: Market Microstructure for Practitioners*.

Thursday's "Flash Crash" had a very simple cause. Too many market sell orders overwhelmed the buy orders then waiting to be filled in our various electronic markets. As the buy orders quickly filled, prices fell. In some stocks, such as Accenture, prices fell almost to zero.

Prices quickly recovered when new buy orders arrived.

This much is obvious. Less obvious are the reasons why market sell orders overran the standing buy orders, and what should be done to prevent similar events in the future.

The imbalance had three possible explanations: Imprudent traders, fat fingers, and market manipulation.

The most likely cause was the submission of market orders by imprudent traders who do not understand electronic trading well. Traders in electronic markets should always submit limit orders rather than market orders.

To understand why, consider the differences between the two order types:

Market orders must be filled at the best available price. In electronic markets, market orders can trade at terrible prices if no other prices are available. Limit orders also must be filled at the best available price, but with an important restriction. Sell limit orders cannot be filled at prices below their limit prices, and buy limit orders cannot be filled at prices above their limit prices.

Investors who want to trade immediately generally submit market orders. Unfortunately, Thursday's episode clearly demonstrates that using market orders can be exceptionally dangerous. Impatient sellers should have submitted aggressively priced limit orders. Such orders would not have filled at absurdly low prices.

Had traders only submitted limit sell orders, Thursday's extreme volatility would not have occurred.

Here is what likely happened: Following bad news from Europe, prices fell steadily during the day. By 2:30 PM, prices had dropped by about 3 percent in orderly trading.

[1] A slightly shortened version of this op-ed appeared in the *Wall Street Journal* on May 19, 2010.

Some investors nervous about the run-up in market prices over the past year probably sold to take profits. European and American debt problems surely weighed heavily on their minds.

Many of the buyers were dealers and other proprietary traders who employ dealing strategies. These traders were accumulating inventories throughout the day.

As these buyers lost money, they became nervous. With day-end approaching, some decided to sell their positions to limit their losses, to reduce their risks, and to close their positions. Their selling pushed prices down further.

The drop in prices triggered stop loss sell orders. Most stop orders are market orders and so they pushed prices down without limit.

Neither human nor electronic dealers can survive in the face of so much selling. Many dealers—human and electronic—thus withdrew their buy orders.

In some stocks, the sell orders fully exhausted the remaining buy orders, and prices fell to zero.

The markets recovered when buyers saw incredibly attractive opportunities to purchase stock at absurdly low prices. Prices rose as they competed to trade. Remarkably, the recovery took place in only five minutes.

The other two explanations for Thursday's meltdown are much less likely.

Perhaps some trader with "fat fingers" submitted a much larger order than intended. Possibly, but traders, brokers, and exchanges all have systems to stop extraordinarily large orders before they reach the market.

Alternatively, a proprietary computerized trading system with "fat fingers" might have run out of control. While such failures are possible, and indeed have occurred in the past, many systems now prevent them. People pay close attention to this problem because runaway trading systems can bankrupt a firm. In any event, proprietary trading systems almost never submit market orders, so they were not likely responsible for the meltdown.

The final, and least likely, explanation is market manipulation. Perhaps some trader saw that buy orders were almost exhausted after the 3 percent price drop. That trader might have submitted large sell orders to test the market. These orders could have exhausted buy orders and caused prices to free fall. The trader then would have profited by buying at lower prices.

Regulators need to address Thursday's market failure. What should they do?

The simplest solution would be to prohibit the use of market orders. Traders who want to trade quickly should simply submit aggressively priced limit orders that are immediately marketable. Many trading systems in the US and abroad already only process limit orders. The SEC could

require that all brokers accept only limit orders, or that brokers convert all their customers' market orders to aggressively priced limit orders.

Had the sell orders — including the stop loss orders — all been limit orders, trading would have stopped without any regulatory intervention when the buy orders were exhausted. Prices would not have fallen to absurd levels. Buyers would have quickly returned to the market, and a bad down day would have remained just that—a bad day, but not a disaster.

The next most sensible solution would be to require coordinated trade halts in a security whenever price drops by five percent. Halts for no more than a minute to five minutes are common in electronic markets elsewhere, but not in the US equity markets. Halts would be difficult to implement because all exchanges must stop trading at the same time. Coordination issues undoubtedly explain why our electronic markets do not already these protections.

The worst solution would be to impose more stringent market-wide trading halts. We were lucky on Thursday. Had the failure occurred ten minutes earlier (before 2:30 PM), and had prices dropped just one percent further, a market-wide circuit breaker would have halted trading for 30 minutes. That halt could have panicked traders so that prices might not have rebounded when the market reopened. The SEC must act quickly to ensure that we do not have another chance to see what would happen.

Electronic trading substantially has decreased transaction costs in the US. Nearly every retail and institutional investor has benefited. However, the Flash Crash demonstrated that many traders still do not understand that they should not use market orders in electronic markets.

The SEC would be wise to immediately prohibit market orders. Such regulation would effectively prevent a reoccurrence of Thursday's market failure. The cost would be trivial, and the regulation would not disrupt any legitimate trading strategy.

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