



James J. Angel, Ph.D., CFA
Associate Professor of Finance
Georgetown University¹
McDonough School of Business
Washington DC 20057
angelj@georgetown.edu
1 (202) 687-3765

June 24, 2011

Securities and Exchange Commission
100 F St. NW
Washington, DC 20549-9303
Rule-comments@sec.gov

Release 34-64547
File Number 4-631

Dear Securities and Exchange Commission:

Here are my comments on the proposed NMS “Limit Up/Limit Down” plan:

Background

The plan generally would establish price bands that prevent trading outside the bands. If the quotes touch the bands, trading enters a “limit state” for up to 15 seconds that would prevent trades taking place outside the bands. The limit state could clear itself through normal market transactions. If the limit state is not cleared within 15 seconds, then a trading halt (euphemistically called a “pause”) would take place. The stock would then reopen using the normal opening procedures.

The “Flash Crash” of May 6, 2010 highlighted the vulnerability of our market network to various glitches and of the need to have shock absorbers in place to contain the damage. From time to time, all markets

¹ I am also on the boards of directors of the EDGA and EDGX stock exchanges. My comments are strictly my own and don’t necessarily represent those of Georgetown University, EDGX, EDGA, or anyone else for that matter.

can be overwhelmed by tsunamis of activity. Such extreme events have happened long before computerized trading and will continue to occur. They are like the risk of earthquakes in California. Another Big One is coming, but we don't know when. Even though we hope it will be many decades in the futures, we need to be prepared.

Extreme events can occur in various situations:

- Single stock meltdowns. The April 28, 2009 incident involving Dendreon is an example of what can go wrong with an individual stock. The stock lost over half its value for no apparent reason in less than two minutes before trading was halted. When trading resumed, the stock returned to its previous value.
- Multiple stock problems. On April 27, 2010, a botched basket trade after the close resulted in the need to bust clearly erroneous trades in over 80 different stocks.
- Exchange malfunctions. On Monday April 25, 2011, a programming error at NASDAQ related to the timing of the preceding holiday weekend resulted in trade halts and cancelled trades affected over 80 stocks. The existing circuit breakers kicked in for only 20 of them.²
- Partial network failures. In the Flash Crash of May 6, 2010, a large order in the E-mini S&P 500 futures contract is thought to have caused a rapid decline in the price of the futures contract. This shock quickly generated a tsunami of activity that reverberated through the equity market network, overwhelming the capacity of many of the IT systems in the market. The consolidated tape for NYSE stocks experienced delays in 1665 symbols averaging 10 seconds during the height of the Flash Crash. Concerns over "data integrity" led many important market participants to withdraw temporarily from the market network.³ With some important stabilizers such as market makers and arbitrageurs on the sidelines, market prices became chaotic. Some stocks such as Accenture traded at \$.01 and others such as Sotheby's near \$100,000.

² See Wall Street Journal "Nasdaq in Talks Over Losses from Monday Glitch." April 28, 2011
<http://online.wsj.com/article/0,,SB10001424052748704187604576289242859378466,00.html>

³ See FINDINGS REGARDING THE MARKET EVENTS OF MAY 6, 2010 REPORT OF THE STAFFS OF THE CFTC AND SEC TO THE JOINT ADVISORY COMMITTEE ON EMERGING REGULATORY ISSUES
<http://www.sec.gov/news/studies/2010/marketevents-report.pdf>, especially page 35. "As such, data integrity was cited by the firms we interviewed as their number one concern. To protect against trading on erroneous data, firms implement automated stops that are triggered when the data received appears questionable." See page 77 for information on the delays in the consolidated tape.

- Systemic panic. In the Crash of 1987, the market was overwhelmed by a broad wave of selling. Exchange systems could not keep up with the volume, and market-wide circuit breakers were imposed afterward.⁴
- Hacking. Our exchanges, as are most large institutions, are constant targets for hacking. It is possible that various market systems -- either at exchanges or brokerage firms or elsewhere -- could be compromised leading to a huge mess.
- Unanticipated problems. It is also possible and perhaps likely that the next big glitch will occur because of some as yet unanticipated problem.

General Comments

This is an improvement over the current situation.

This proposal is an improvement over the current circuit breakers and should prevent many of the erroneous trades that have bedeviled our markets.

The job is not done yet.

Although this is an improvement over the existing arrangement, much work remains to be done to ensure that we have reliable shock absorbers. It is quite unclear how market participants will react to the price bands, especially in times of market stress involving multiple securities in multiple asset classes. The Commission and its overworked staff should refrain from the temptation to declare “Mission Accomplished” and move on to other tasks. The implementation should be closely monitored with the expectation that it will be refined over time.

The system will need fine tuning for smaller and more thinly traded stocks.

Some stocks have extremely wide spreads and will constantly be entering limit states and triggering pauses. Consideration needs to be made for still wider bands for some stocks, perhaps by establishing a Tier III with wider bands. Similarly, the proposal does not say how the range is set for a very thinly traded stock that may not open for several hours. Will the reference price just be the first print, whenever it happens to occur?

⁴ See Report of the Presidential Task Force on Market Mechanisms : submitted to The President of the United States, The Secretary of the Treasury, and The Chairman of the Federal Reserve Board (1988)
<http://www.archive.org/details/reportofpresiden01unit>.

What if the market gaps and the quotes bypass the limit state triggering quotes? Would the fifteen second clock and then trading halt be triggered?

What are the best-execution requirements during the limit state?

Suppose that the upper limit of the price band is \$10 and the stock hits the limit state with the bid at \$10. During the limit state, what is the best execution obligation of a broker that receives a market order to sell? Under normal conditions, a market order should be executed immediately at the quote. Should the broker seek to execute the sell order at the \$10 bid, under the presumption that the investor wants out immediately before a potential trading halt? Or should the broker not execute the order as the stock is likely to go up when the stock re-opens? There should be some clear written guidance on this issue from FINRA or the Commission to prevent confusion.

Given that unsophisticated retail traders may get bad fills during the limit state, I think that keeping the limit state as short as practicable is a good idea. The CME has shown that a five second pause in their stop logic seems to work, so I suspect five seconds should be long enough before entering the trading halt.

Shock absorbers need to take into consideration all possible failure modes or they could backfire.

It is fairly straightforward to design shock absorbers for one scenario, but they could misfire badly in other extreme situations. Take, for example, the market wide circuit breakers that were imposed after the 1987 crash, and **imagine what would have happened on May 6, 2010 if the Flash Crash had been 20 minutes earlier and 1% deeper.** Such a move would have triggered the one hour trading halt. Instead of a brief glitch that was over before humans could react, the trading halt would have hit the media. Headlines blaring “**Market plunges – trading halted**” could have set off a major panic. For this reason I think it is a good idea to scrap the old market-wide trading halts and replace it with the proposed plan.

The complexity may backfire under stressful conditions.

One of the problems that exacerbated the May 6, 2010 “Flash Crash” was that many systems experienced capacity issues and there were delays and outages in various systems. Some data feeds were extremely delayed. I am concerned that in another stressful market condition, the SIPs may not be able to respond quickly enough to prevent another mess. What happens if the trading bands disseminated by the SIP are out of touch with reality? This could lead to erroneously rejected trades under reasonable non-extreme conditions.

Consider a simpler approach with static price bands based on the open.

Even if the SIPs could keep up with the data flow, the rest of the market may not be able to. Fluctuating price bands will be a nuisance for many market participants. A simpler approach would be to set wider

static price bands off of the opening price rather than with a constantly changing price. This would be much simpler than the complex system proposed here.

Consider allowing humans at the exchanges to exercise some judgment on pause length.

In a multi-stock event, it might be appropriate to extend the trading pause. Given that the next glitch may be of a type that we have not anticipated, it would be appropriate to give the humans in charge of operations at the exchanges some discretion in handling extreme events.

The close is the most important times and it must be protected.

I am sympathetic to the concerns expressed by some commentators that the time around the close is a very high volume time and any kind of halt would be disruptive. This is true. However, the closing price is the most important price of the day as it affects index calculations, mutual fund NAVs, margin calls, and more. It is extremely important that the closing price reflect the market's estimate of the value of the security. If there is a disruptive event just before the close, it would be appropriate to extend the time of regular way trading and the time of the closing auction to make sure that the final closing price is accurate.

The pre-open and post-close also need protection.

Although trading volume in the pre-open and post-close time slots is small compared with regular trading hours, multiple stock events have happened at these times, as was seen on April 27, 2010. Perhaps a much simpler "wide band" regime with a stable price band based on the previous close would suffice during these trading hours.

Consider pre-planned load shedding for dealing with data overloads.

No matter how much capacity is installed, at some point there will be such a large tsunami of activity that it will overload the market network. When complex networks are overloaded, the failures often occur in unanticipated bottlenecks. Some of these bottlenecks may not be at regulated exchanges, but elsewhere in the market network such as IT vendors. Contingency planning should take place to deal with such problems and perhaps, like with utilities, have plans for load shedding when the network is overloaded.

What is the rest of the world doing?

The proposing release says nothing about how the rest of the world is addressing these issues. The US is not the only jurisdiction that has faced these problems. Indeed, every market has similar issues. Explicitly studying and reporting on what other countries have done should be a standard practice in all rule proposals. This will ensure that we learn from the experience of the rest of the world, good or bad, and thus result in much better policy making

Respectfully submitted,

James J. Angel, Ph.D., CFA
Georgetown University
McDonough School of Business
Washington DC 20057
(202) 687-3765