

Limit Up – Limit Down Plan to Address Extraordinary Market Volatility
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Comment Letter from Steve Wunsch

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

Dear Ms. Murphy:

My name is Steve Wunsch. I have worked in the exchange industry for over three decades. I am the founder of the Arizona Stock Exchange and an inventor of the ISE Stock Exchange, two markets that were regulated by the SEC. I am writing to address the topic of extraordinary market volatility and the planned implementation of a limit up - limit down procedure to contain such volatility. I will also address the combination of other rules and facilities that are meant to deal with extraordinary volatility and would operate alongside limit up - limit down.

Since the “flash crash” of May 6, 2010, the SEC has been actively engaged in devising stabilization measures that would prevent another flash crash. In addition to a number of explicit price-dampening plans, the anti-crash arsenal has also included a new market access rule, a contemplated consolidated audit trail, a variety of changes to rules governing dark pools, market maker obligations, high frequency trading, trading fees, short selling, a trade-at rule proposal, and many other aspects of the market structure. I write out of concern that such measures, singly or in combination, are more likely to cause further crashes than to prevent them. In fact, the actions the Commission is taking or contemplating, reportedly aided now by the Justice Department’s Antitrust Division, may lead not only to further crashes, but also to far worse problems than the flash crash, both in terms of extraordinary volatility and in terms of investor confidence.

Any such outcomes would be ironic and tragic, because the actions the Commission is taking and planning to take are unnecessary. The chance of another flash crash occurring in the absence of Commission action is negligible, and has been negligible since the day the flash crash occurred. I described both what caused the flash crash and why another is not likely to occur absent further Commission action in a series of articles, the most recent of which (*Straitjacket*, January 14, 2011) is a postscript to this letter.

The fact that another flash crash is not likely absent Commission action does not mean we are out of the woods. More such aberrational events, including ones that would be much worse than the flash crash, could occur. But they would only be likely to occur if the Commission continues on its path of addressing extraordinary volatility and other perceived market structure problems with more of the same kind of active engagement policies that caused the flash crash. Unfortunately, as the

limit up - limit down proposal demonstrates, the Commission is still firmly committed to that path of active engagement.

Properly understood, the flash crash is an unintended consequence of the progressive application of antitrust to U.S. stock markets under the rubric of the National Market System, or NMS. The instant proposal, for example, is characterized as a National Market System Plan, in this case pursuant to Rule 608(a)(3) of Regulation NMS, which is a specific recent iteration of the original NMS authorized by Congress in 1975. Under NMS, both generally and in all of its particular iterations, the Commission has transformed the market radically. The market structure we see today is both very different from and very much more complicated than the structure that preceded NMS. Participants experience such complexity as fragmentation, as high frequency trading, as unfairness, and more generally as an escalating unfamiliarity, as if there were no rhyme or reason to the operating mechanics or principles of the market the Commission is designing. This unfamiliarity generates a palpable sense of unease among many investors.

The more complex the Commission makes the market, the more likely it is that surprises like the flash crash will occur. The remedies that have been enacted or are contemplated to address extraordinary volatility in the wake of the flash crash, including the limit up - limit down plan, have ratcheted up complexity by an order of magnitude from anything we have seen before, including the already extremely complex structure that preceded the flash crash and contributed to it. The measures in the current proposals to address extraordinary volatility and to otherwise change market structure and operations amount to a many-belts and many-suspenders approach. So convoluted and unfamiliar is the prospective overall equity market structure as a result of these new rules that, even if they do not cause operational problems or crashes, there is a risk investors will be repelled by them. Such unfamiliarity alone would be likely to accelerate the exodus of investors from equities. And if the unfamiliarity is aggravated by further extraordinary volatility, the exodus could become a panic, with tragic effects on the U.S. economy.

My concerns were raised in the aforementioned articles about the flash crash, and in a recent essay, *War On Wealth*. The following is an excerpt from *War On Wealth*, which describes the risks due to complexity inherent in the current situation:

“ . . . the term [circuit breaker] has been applied to a wide variety of speed bumps and breaks in trading that are supposed to allow rational pricing to return after market drops. These include the new “modified uptick” short selling circuit breakers, the NYSE’s LRPs (Liquidity Replenishment Points) Nasdaq’s Volatility Guard, the SEC’s single stock circuit breakers and, coming soon, the SEC’s limit-up/limit-down circuit breakers, which will partially, but not completely, replace the earlier single stock circuit breakers. All of these different procedures at different markets could and probably would trigger at different times, have different recovery procedures and time frames and fail-safe fallbacks. Limit-up/limit-down, for example, will either end when the market retreats from the limit, or, if it has not traded or retreated while it was sitting on the limit for fifteen seconds,

then it will fall back to a re-opening procedure, like the original single stock circuit breakers did. Re-openings will take five minutes, unless under some circumstances they take ten minutes. Other markets cannot trade until the primary re-opens at the end of five minutes, but can trade if the primary has to go the full ten minutes to re-open, except under some circumstances. Short selling circuit breakers will apply for the day they are triggered and for the next day. Information on whether a short selling circuit breaker is on day one or day two may or may not be available. Some circuit breakers will trigger at 5%, some at 10%. As a result of all this disparate circuit breaking, just as it is impossible to keep an eye on high frequency quotes and prints without computers, it will be impossible to keep track of all the circuit breaking if the market goes into a serious slide. That could cause both those with computers to drop out of the market algorithmically, and those without them to panic and get out the old-fashioned way. These actions could themselves cause an acceleration of the decline that triggered the first wave of circuit breakers and could thereby cause more circuit breakers to pop in a new wave, and then new selling, and then new circuit breaker popping etc., in a self-reinforcing positive feedback loop.

“Underlying all of these circuit breakers is the assumption that markets have a good way to turn back panic with their re-opening procedures. That is a questionable assumption. The opening procedures of the primary markets were designed and mandated by the SEC as the result of behind the scenes *quid pro quos* required of Archipelago (now NYSE-Arca) and Nasdaq when they wanted to become exchanges. Archipelago had been an ECN and Nasdaq had been a dealer association. The Commission required them to adopt single price opens and closes as a condition of allowing them to become exchanges. Unfortunately the structures, as regulatory compromises often are, leave much to be desired in terms of call market efficiency. While they seem to work OK in normal times, in abnormal times, such as at S&P adds and deletes, and Russell rebalancings, they often perform erratically. By definition, circuit breaker re-openings are likely to be conducted during the most abnormal of abnormal times.

“In addition to the procedures formally called circuit breakers, a variety of automatic processes have been implemented, or are being considered by the Commission, or have been recommended by a joint SEC/CFTC flash crash advisory committee. These include: market maker obligations to stick around when things get tough (rather than dropping out, as high frequency market makers did during the flash crash); changes in maker-taker fee and rebate schedules to induce more making, less taking; minimum times that orders have to be good for before they can be cancelled; penalty charges for too many cancellations compared to orders or executions or both – and many others. It is not known how many of these will be implemented, but the Commission does seem as always inclined to do more rather than less. In addition, one important change has already been made. Billed as the elimination of stub quotes, those one-cent bids that caused so much havoc in the flash crash, stub quotes were not really eliminated, but re-

priced so that they are much closer to the current market. While this means that you won't see stocks go to zero in a flash again, they can still go 8% or so in a flash. That was once considered pretty far. In fact, it would have been nearly unthinkable for a stock to drop that far in a flash. One wonders how investors will react to seeing lots of sharp jerks of stocks to stub bids, even if they don't go beyond 8%. And of course they still might in another few seconds, and they could still hit limit-up/limit-down circuit breakers, which could turn into raucous re-openings if a stub bid had just been hit for no apparent reason.

“With the market now so dependent for liquidity on high frequency trading, some of which looks for simultaneous opportunities to buy one stock and sell another in a “stat arb” or similar strategy, one wonders if liquidity could be disrupted by the disparate timing of circuit breakers triggering in related stocks. One wonders also if all of these disparate triggers sprawled all over the market will open up gaming possibilities that didn't exist before. From stub quotes to limit-up/limit-down circuit breakers, triggers have been tightened so as to make it more likely they will be hit. There is even talk of narrowing the Brady circuit breakers from their current 10%. The SEC apparently thinks more circuit breaking will give comfort, because it believes pauses are inherently calming. That may not be the case now. Markets are no longer, thanks to NMS, run by humans who make judgments about conditions as they occur. Market making is now almost entirely automated, and the algorithms have only a very limited ability to respond ad hoc to unusual circumstances. They are not calmed by pauses. In fact, they are more likely to shut off entirely if something unusual happens. Many of them need constant streaming data from many stocks trading continuously. If the tight triggers of the new circuit breakers result in lots of stocks going into pauses at different times, and with different expected return schedules, to the algo, that might just look like danger.

“It is certain that the operating mechanics of the markets have been made much more complex as fragmentation caused by NMS has taken hold. It is also certain that the new automatic circuit breakers and other features contemplated will ratchet up complexity by an order of magnitude or two. Since it is in complexity that surprises lurk, it is also certain that the danger of surprises has dramatically increased, too. In particular, there is a growing risk that circuit breakers and other automatic processes that kick in during a slide, instead of calming markets and bringing about rational pricing, will cause more panic and an increase in *irrational* pricing. This scenario would be most likely if market making progressively shuts off as a slide gathers momentum and circuit breakers progressively kick in and effectively blind the market makers' algos to the information they need to operate. In addition, because the re-opening procedures are so ineffective, there is the risk that, if the big Brady circuit breaker is ever tripped, that could be all she wrote for quite some time. How would investors react to that, once they had time to think again about whether equity investing makes sense for them?

“Many of these choices are still in flux, but that should give no one comfort that we will get it right this time. More likely, with so many more possibilities on the table, the risk that we will again miss something crucial – like we missed the stub quotes and stop loss orders that caused the flash crash – is high and rising fast. The SEC process that is driving this risk, including inviting everyone into the kitchen through comment periods and its ongoing urgent conversations with other government agencies and Congress, is making it more likely to blow up rather than less.”

To avoid causing such problems by its own actions, I would advise the Commission to resist active engagement. Rather, the SEC should adopt a policy of passive disengagement. Radical changes, like all of the circuit breakers that have been contemplated or enacted so far, have a very high likelihood of unintended consequences. The single stock circuit breakers in the current pilot, for example, were not needed to protect us against any real threats of volatility over the period they have been in place. But they tripped a few times anyway, mostly due to erroneous trades or other surprises. While they prevented no real volatility, the fact that the circuit breakers were only triggered in one or two stocks per month means that we have learned nothing whatsoever about how they would perform if several hundred of them were triggered in an extraordinary-volatility event. In other words, we learned nothing from the pilot about how these circuit breakers would perform when really needed. Would they curtail extraordinary volatility? Or would they exacerbate it?

Nonetheless, because of the perceived failure of the single stock circuit breaker pilot due to erroneous triggerings and other surprises, the Commission has moved toward a limit up - limit down regime to partially – but not completely – replace the pilot. Limit up - limit down would avoid erroneous triggerings as well as obviate the universally derided “obvious error” policies, under which, for example, after the flash crash, trades that were 60% or more away from where they were before the crash were broken, while trades that were 59.999% or less away from pre-crash levels were required to stand. This obvious error policy operated pursuant to a process the SEC required the exchanges to adopt prior to the crash. Like many aspects of the market structure, the flash crash revealed how poorly thought out this policy was. Limit up - limit down would thus avoid the continuation of two policies that are evident sources of embarrassment to the Commission, both of which were enacted, as limit up - limit down would be, as if they were urgently needed to prevent extraordinary volatility or deal with its consequences. But it is entirely unclear if the effect of limit up - limit down would be beneficial or harmful. Even if limit up - limit down contains *ordinary* volatility within bands as intended, it is not yet known whether it will dampen *extraordinary* volatility or make it worse. Furthermore, we have no way to predict if the existence of such new and unfamiliar measures will reassure or repel investors. These are very large risks to be taking in order to solve a problem that we don’t have.

It must also be mentioned that the comment process for proposed rules is inherently inadequate for ferreting out problems before they occur. Reg. NMS went through extensive comment and many supplemental hearings and industry and

regulatory working group observation processes from 2004 through 2005 to vet and prepare for the rule prior to implementation. And such measures were continued at increased intensity as it was rolled out carefully in 2006 and 2007. Reg. NMS then operated in live markets for three years before the special circumstances of May 6, 2010 caused the flash crash. Under any interpretation of what caused the crash, there was no excuse for not having seen during Reg. NMS vetting the potential interactions of stub quotes and stop loss orders before they caused such havoc. Apparently, the most diligent efforts applied with the best of intentions cannot assure that comment processes will reveal problems before they occur.

That is why a policy of active engagement is so dangerous and why a policy of passive disengagement is the more prudent route for the SEC to take. Under a passive disengagement policy, the Commission would, first, do no harm. Less is more. Under passive disengagement, the Commission would not enact any of the current planned circuit breakers or other rules that are likely to have large impacts on how markets operate. Second, the Commission should examine which elements of its previous rules are causing problems. At the top of the list, the rule requiring market makers to maintain continuous two-sided quotes should be rescinded. That simple action would, by itself, eliminate stub quotes – for real, this time.

Lastly, the Commission and the Justice Department should drop any plans that would affect market making. Saddling high frequency traders with obligations, for example, is likely to backfire.

Sincerely yours,

Steve Wunsch

P.S.

STRAITJACKET

What really went wrong in the stock market on May 6? Prices aside, all of the plumbing was working fine. Not only were there no fat fingers, rogue algos, manipulators or terrorists at work, there were no significant breakdowns of order routing systems or data systems or any other elements of the stock trading infrastructure.

So if everything was going right, what went wrong?

Maybe the reason we are having such difficulty seeing the cause of the wildest price swings in stock market history is that the market was operating pretty much as it was designed to on May 6, and did so all the way through the crash and the recovery.

On August 28, 1996, SEC Chairman Arthur Levitt introduced the template for today's electronic market as follows:

“The rules we will vote on today are among the most significant ever to be considered by the Commission. Over the past eleven months, as the proposals were subject to public comment, we have heard from supporters and detractors alike that these rules will fundamentally change practices in the securities industry – we agree. That is our goal.”

With that mission in mind, the Commission converted Nasdaq from a telephone-based dealer market to a system of transparent electronic screens where dealers and investors were equals. The screens tied together old and new exchanges and ECNs (electronic communication networks – a new category of market created by these rules), and the whole multi-market conglomeration became one National Market System.

Like it or not, this is the system we’ve got today, and it ran without a hitch on May 6. While there were isolated glitches and slowdowns, as there are on any busy day, the official SEC/CFTC report investigated and exonerated all of them as potential causes of May 6.

Not only was the flash crash market firing on all cylinders operationally, none of the currently popular bogeymen had anything to do with the crash, either. These include flash orders, dark pools, high-frequency traders, co-location, naked-access and quote stuffing. High-frequency traders didn’t look too good, but mostly because they pulled back from trading during the crash, not because they caused it.

So, again, if everything was going right operationally, and none of the usual suspects was to blame, what did go wrong?

The SEC/CFTC report blamed a big trade in the futures market, but that answer hasn’t satisfied many people. Unaddressed was what would have happened if such trades had occurred in a distant enough past to pre-date the National Market System reforms. Why are markets flash-crashing now, when they never did before? The answer, clear enough in the report, is that the reforms caused the flash crash.

The traditional trading practices of Wall Street were inherently slow because they were not electronic. This allowed time for human discretion to be applied at various stages along the path to a trade. Such discretion – and the resulting separation in time of the stages of a trade – acted as natural buffers against crashes. Bad prices and bad trades, such as can result from temporary gaps in liquidity, were stopped before they did any damage. Illegitimate prices that did not reflect supply and demand would not be printed as if they were legitimate.

But now the National Market System runs, as intended, like a system. The stages of a trade are tightly coupled to each other, which prevents the old buffers from operating. Illegitimate prices now gain instant legitimacy through printing to the tape. What might have been only a bad day before can set off a cataclysmic doom

loop now, where bad prints feed off each other, participants flee the screens and prices cascade downward in a self-reinforcing spiral.

A critical feature of this post-reform disaster scenario is its speed, which is virtually instantaneous. There isn't even time for panic in a traditional sense, as if investors were entering new sell orders based on what they physically see on the screens. Rather, most orders are generated or canceled automatically from pre-programmed sources. This causes the illegitimate prices to show up instantly, irrespective of what investors see or think, or what supply and demand would dictate under normal auction or dealer market procedures.

While there isn't time for panic in a traditional sense, panic is certainly justified. That is why many professionals who exited the market on May 6 did so algorithmically, which is to say instantly.

With the markets no longer operating in human timeframes, key parts of the flash crash happened in milliseconds, way too fast for humans to stop, even if they still had the operational or legal leeway to do so. But they don't. Given the SEC's insistence on discretionless rules, and Wall Street's consequent near-universal adoption of discretionless automated processes, anyone who might once have put a stop to the crash has long since lost the necessary tools.

Without human discretion, tight coupling has become a straitjacket that on May 6 both caused and permitted no escape from automated disaster. Below we'll examine three straps on the NMS straitjacket: the trade-through rule, stop-loss orders, and stub quotes. While there are others, these three are sufficient to explain May 6. Our main source will be the SEC/CFTC report, particularly pages 63 through 67, which tell the whole story.

The Trade-Through Rule

Regulation NMS, enacted in 2005 and implemented in 2007, forced the NYSE to become electronic. Its core feature is a trade-through rule requiring orders anywhere in the NMS to be routed to the best market. Nasdaq was similarly forced to become electronic following the rules announced by Chairman Levitt in 1996. Although those earlier Nasdaq reforms did not have a formal trade-through rule, their order display requirement and best execution interpretations had a similar effect. Moreover, the 2005 Reg. NMS trade-through rule applies to all markets, including NYSE and Nasdaq.

Both markets were transformed by these rules from manually operated monopolies into electronic multi-market conglomerations tied together by NMS. Prior to NMS, each market played a distinct role and each respected the other's space. New York listed the big, seasoned companies and dominated trading in them. It did not list new IPOs. Nasdaq dominated trading in its own separate list and was where the new companies were born through IPOs.

The former monopolies not only don't respect each other's space anymore, but each is leading a horde of electronic competitors invading the other's space.

The NYSE and Nasdaq once handled their order flows in distinctly different ways, as auction or dealer markets, respectively. Now the conglomerations of competitors sharing their flows are roughly identical as conglomerations, and the individual competitors that make up the conglomerations are nearly identical, too. The former auction market and the former dealer market are now, with minor exceptions, just ECN-like clones of each other. And both operate multiple clones on the ECN model, almost all of which trade not only their own lists, but also each other's lists.

The ECN model was also adopted by the regional exchanges and, of course, by the original ECNs. Many of the regionals and ECNs still operate, either independently or as subsidiaries of the original main markets, which run them as clone exchanges. A couple of the original ECNs became independent exchanges, too, and promptly launched their own clones. All of these ECNs and exchanges are tied together by the Reg. NMS best-price routing requirement. Thus the trade-through rule has become the overall market's matching engine.

The terms "market" and "exchange" must be used advisedly for these clones, because they are not allowed to organize their trading in ways that would centralize order flows, as any market or exchange worthy of the name would. Their structural discretion and centralizing potential are instead overridden by the best-price routing dictates of Reg. NMS. Because of this, the only stock trading entity that fits the common understanding of the terms "market" or "exchange" in the United States today is the Reg. NMS-driven conglomeration of them all.

On May 6, the Reg. NMS market performed admirably on an operational level, in spite of all its fragmentation and required routing and re-routing to best price. But still it flash-crashed. To understand why, it is necessary to see why the old markets were not susceptible to flash crashes.

Prior to the NMS reforms, trading was not anonymous, as it is in today's electronic markets. This gave traders incentives to behave according to certain expected protocols in order to protect their own reputations, as well as those of their firms and exchanges. Importantly, since the two main markets were not clones, but sported distinctly different order flow organization methods, their reputations were paramount. With reputations on the line, traders and exchange officials applied discretion based on a code of conduct that vetted each stage of a trade for reasonability.

After reforms were enacted, trading became anonymous and exchanges became clones, so reputations were irrelevant. Reasonability, whether as a matter of effective order flow organization or as a measure of ethical trader behavior,

dropped out of the equation. Instead, automated and discretionless compliance with such SEC requirements as the trade-through rule was all that mattered. Automated and discretionless compliance, of course, means instant compliance.

Thus the conglomerate National Market System became a system where a stock could instantly dive to unreasonable prices, such as zero.

So far we've looked at how the modern stock market under NMS's multi-market matching engine was stripped of discretion and thereby stripped of its natural buffers against a crash. But even that wouldn't have led to a crash if no one had put orders and quotes into that matching engine that could trade at unreasonable prices. In other words, we've looked at how the market could flash-crash. Now let's look at why it did flash-crash.

In particular, let's look at how two order-generating functions, stop-loss orders and stub quotes, were also stripped of discretion. Here, again, we find the SEC effectively mandating automated compliance. The result was the necessary fodder of unreasonable quotes and orders that could and did trade at unreasonable prices and became the flash crash.

Stop-Loss Orders

When a stop-loss order is triggered by a trade at its stop price, a "held" market order to sell or buy is generated. Held means that the broker handling it may not exercise any discretion to try for a better price or otherwise delay its execution at the best price he can immediately get.

The meaning of "immediate," however, changed in practical terms with the switch from manual to electronic markets.

Compliance officers that used to insist that their sales-traders not waste any time phoning in a market order to the floor, and that the clerk there similarly not waste any time getting the order to the specialist, would now insist that the whole process be automated. While automation assured effective compliance on even the tightest definition of "immediate," it also skipped many opportunities inherent in manual processing to stop a trade at an unreasonable price.

Traders have always known that a market order to sell implies an absurd willingness to sell at zero. But in the old days that never happened and was, for all practical purposes, unthinkable. Between making the phone calls, walking from booth to post and repeatedly speaking the actual words asking for the execution of the order, no market orders to sell ever got executed at zero.

Many were outraged that retail stop-loss orders to sell were executed at a penny or less in the flash crash, some reportedly even at zero, perhaps due to rounding. Many who heard such stories were initially unable to believe them, and

thought that any orders and executions at such prices may have originated with professionals trying to manipulate the market. This view was buttressed by the facts that most of those sell orders had limits on them and were marked short, which sounded like professional practices, not retail practices.

It turns out, however, that retail customers were indeed the source of those orders, because dealers hired by their brokers were entering limit orders on their behalf.

The dealers would normally take the other side of such orders themselves. But they had stopped doing so amidst the violent price changes for fear of the risk to their capital. They were instead running in fallback mode for such circumstances, which is to send orders through their smart order routers to the best transparent price in the NMS.

For compliance reasons, both the decision to go to fallback mode and the operation of it once chosen were in all likelihood fully automated. So efficient were their automated compliance practices that on May 6 dealers were able to immediately chase prices down to zero using sequentially lower limit orders, or by automatically setting the limit at the best NMS price, which amounts to the same thing if the best price is zero.

As to the fact that the orders were marked short, that was the result of the dealers' normal practice when in fallback mode. They would first sell short themselves as riskless principals at whatever NMS market had the best price and then transfer the trade to the retail customer.

And so it came to pass that retail customers, using a stop-loss tool that was often recommended for protection, and did seem to protect them in the old markets, had their entire positions effectively confiscated in an instant. Of course, the worst trades, such as those at a penny or less, were subsequently broken. Still, imagine how you would feel if your position in Accenture, worth \$40 a share one moment, had disappeared in a few seconds by suddenly dropping to a penny where your broker sold you out, only to pop back up to \$40 a few seconds later without you.

No wonder many were livid. Couldn't their brokers at least have given them a heads-up? A quick call or an email? Well, no, not in a world of automated, discretionless compliance.

As bad as this seemingly callous treatment of retail customers was, even their stop-loss orders would not have resulted in disaster were it not for one final element in this tale of woe. If there were no ridiculously priced quotes in the market, there would have been no trades at ridiculous prices.

Stub Quotes

Which leads us to the most disturbing aspect of the entire affair, in which the SEC supplies the final piece so that the flash crash actually does happen. The Commission does this by requiring some exchanges to automatically set and replenish stub quotes when a market maker drops out of market making, thus giving those vulnerable retail orders an endless supply of unreasonable quotes to trade with.

The Commission set this trap at least by approving rules that required automatic placement and refreshing of stub quotes on some exchanges, and perhaps by insisting that they adopt such rules. In any case, the rationale for stub quotes arose in the first place out of the SEC's misguided requirement that market makers maintain continuous two-sided quotes.

It should have been obvious by now that market makers don't really make two-sided markets. Either their bid or their offer is more aggressive, depending on which way they really want to go.

The parallel investigations by the SEC and the Justice Department that led to the 1996 reforms found that Nasdaq dealers were usually three quarters wide in the most active stocks, with only their bid or their offer at the best price at any point in time. Since the spread in such stocks was usually a quarter, the other side of their two-sided quote was clearly not serious.

The SEC and Justice seemed scandalized by this practice, as if it were manipulative and deceptive, rather than just a normal practice that recognized the reality of dealers' one-sided interest. An apparent consequence was to harden up the continuous two-sided quoting obligation.

Today, high-frequency traders make much narrower markets, and they are often at the best price on both sides of the market, which is sometimes only a penny wide. But they are still successful in the degree to which they know which way they really want to go and are able to price their quote accordingly, with one side being more aggressive and thus more likely to execute than the other.

While there may be legitimate reasons for an exchange to require some amount of two-sided quoting from its market makers in return for granting them certain privileges, there has never been any good reason for the SEC to require that all market makers on all exchanges maintain two-sided quotes all the time.

Stub quotes likely arose out of the regulatory conflict between a stubborn SEC insisting on continuous two-sided quoting and the business needs of exchanges and their liquidity suppliers trying to sidestep this non-productive requirement.

Whether or not exchanges ever sought to jettison two-sided quoting obligations, the fact that several of them adopted nearly identical practices for automatic generation and refreshing of stub quotes suggests that this is another

area where enforcement zeal led to discretionless processes for compliance. Such processes for stub quotes snapped in place the final piece of the tightly coupled National Market System that seized up on May 6.

Although stub quotes were virtually ignored as Reg. NMS was vetted and implemented, they turned out to be deadly on May 6, automatically creating stub bids as low as a penny or less whenever a market maker pulled out of market making, and automatically refreshing them when hit. Because most decisions to pull out were also automated, the situation created an instantaneously unfolding positive feedback loop where rapid price drops led to pulling out, which led to stub bids, stop loss hits, more rapid price drops, more pulling out, more stub bids, more stop loss hits, etc.

The Report

That the above description captures the essence of the flash crash has been obvious since the afternoon of May 6 when reports of stop loss orders hitting stub quotes began to compete with the original fat finger explanation. Every piece of evidence since then, including the official SEC/CFTC report, confirms this interpretation, although finding it in the report takes some digging. A new reader might want to go straight to pages 63 to 67, where the truth is buried.

The report highlights the fact that only a small percentage of stocks succumbed to the disaster scenario, but was notably short on introspection as to why any stocks at all succumbed to it.

Most glaringly, the report failed to mention the fact that this unprecedented market structure failure, with some stocks and ETFs suddenly losing all their value, happened only after the SEC's drastic market structure changes were implemented.

Such a thing had never happened before, but if the currently proposed remedies are implemented, which amount to putting more straps on the straitjacket, we are likely to see more such events, and potentially much worse ones. Such as ones that involve almost all stocks, not just a few. Such as ones where markets don't immediately recover, like they did on May 6.

Circuit breakers depend on pricing efficiency that May 6 proves the market no longer has. They will at least increase complexity and the consequent potential for unexpected interactions in the market, of which the flash crash is the best example so far.

Keystone Cops on the Beat

The coordinated single stock circuit breakers the SEC forced all the exchanges to adopt as an emergency measure within a month of the crash have been

useless at best. Almost all of the halts triggered so far have been triggered accidentally, often by just erroneous trades that were later broken.

Most humorously, a few of the halts were the result of an unexpected consequence of the 2005 decision by the SEC to go with top-of-book protection for the trade-through rule instead of depth-of-book protection. This gives exchanges incentives to minimally comply by sending ISOs (intermarket sweep orders) to other exchanges to hit their best quotes so the sending exchange can then legally trade in its own book at prices that are worse than the other exchanges are showing at their non-top prices. The exchanges do this, of course, to keep the orders themselves rather than send them to hit better quotes at away markets.

Several such maneuvers tripped the 10% volatility threshold. This led to a few unexpected problems. First, the trips of these circuit breakers were unrelated to the true volatility they were meant to dampen. In fact, the maneuvers and the trips both exacerbated volatility. Second, the maneuvers resulted in trade-throughs of visible orders on other exchanges at better prices – albeit legally – and thus looked immediately ridiculous, both from a trading perspective and from a regulatory perspective. Third, because the prices were ridiculous, the resumption of trading caused prices to bounce back, sometimes tripping another circuit breaker halt.

In addition to causing some to call for a reconsideration of the 2005 decision to only go with top-of-book protection, the erroneously triggered halts of all kinds have caused many to call for futures-like limit-up/limit-down procedures. The most often mentioned benefit of this idea is that it would eliminate the error-triggered trades as well as the need to break any trades later. While this would save the SEC some of its current embarrassment over the disappointing results of its first post-crash idea, it is in reality just another idea for which no one knows what the market effect will be or what the effect on investors will be.

The National Market System is now so complex as a system that no one can predict what will happen when something new is added to it, no matter how much vetting is done in the comment periods before a new rule is rolled out. This is a new condition for the stock market that is peculiar to the NMS reforms of the SEC. It did not exist in the pre-NMS days when competition did the vetting and, equally important, the innovators did the explaining to investors about how their innovations would work.

The NYSE's former auction market and Nasdaq's former dealer market are classic examples of innovations that improved market structure. The SEC targeted both of them for fundamental change when it decided to eliminate those structures and replace them with its NMS. The result since then has consisted of nothing more nor less than an unending string of unintended consequences and further errors as previous errors are addressed with more mistakes.

To break the cycle, the SEC could do worse than to reread its flash crash report with an open mind.

Toxic Transparency

Regulators should consider the possibility that transparency is actually the primary cause of the disappearance of bids in Accenture and other stocks and ETFs on May 6. It just may be inherent in the nature of transparent electronic screens that liquidity will disappear more quickly from them when traders get nervous than it would have from traditional manual markets. In fact, it just may be that the May 6 crisis was mostly or solely a too-much-transparency crisis; it would not have occurred at all without NMS's transparency mandates.

The report acknowledges that almost all professionals, not just high-frequency traders, pulled out of the market as soon as they saw prices moving so fast that they knew it was dangerous to stay on those screens. Regulators should consider the possibility that it is the committed, visible, no-backing-away nature of participation on electronic screens that makes participation dangerous. Such discretionless commitment, of course, is the essence of the change to industry practices the NMS reforms were meant to foster. The flash crash may be living proof that the entire transparency premise of those reforms is false.

While the flash crash drove home the point that transparency is dangerous, it is a point that should have been obvious long before May 6.

It should have been obvious right after the original 1996 reforms when block traders didn't do what was expected of them, namely put their blocks on the screens. They knew the screens would be suicidal for their big orders.

It should have been obvious when ECNs found that transparency was toxic for small orders, too. Led by Island-ECN, they had to pay traders "rebates" to get them to put transparent orders on their screens.

It should have been obvious when all markets, including NYSE and Nasdaq, resorted to paying such rebates for transparent orders.

It should have been obvious when paying rebates wasn't enough. Traders also demanded information and access advantages before they would put transparent orders on screens. Such as expensive computer systems, sophisticated algorithms, high-speed lines and co-location. Such as the ability to change quotes dozens of times per second and hundreds of times per trade, thus flickering in and out of transparency at a frequency that makes a mockery of whatever transparent picture the public thinks it's getting.

Without such information and access advantages keeping professionals ahead of the public, they would not play on transparent screens.

The flash crash was the paradigmatic example of new dangers coming into view for professionals before the public was aware of them. That's why the professionals got out of the way by leaving the screens. And it's why the public, without such advantages, got slaughtered.

If regulators think they have created a level playing field with NMS, they should think again.

If they think they have created a market that lets investors trade with each other without intermediaries, they should read again what happens when all the intermediaries disappear.

The NMS changes did reduce trading costs dramatically. But was it worth it? The reductions were sold as an unalloyed benefit, as if redistributing trading costs from professionals to retail could do no harm and besides would introduce efficiencies to the market via transparency, automation, fairness, and the ability to trade without intermediaries. The flash crash proved that all of the promised efficiencies of NMS were pipe dreams, leaving nothing but its raw redistribution effects – and leaving the SEC with no other justification but redistribution for its NMS role.

Two Important Flash Crash Exceptions

Two very important exceptions to the flash crash must be noted. First, the NYSE avoided the experience because its liquidity replenishment points, or LRPs, permitted it to untie the straitjacket. The partially manual LRPs allowed the Big Board to apply some measure of old-fashioned reasonability tests to price formation. As a consequence, no NYSE trades printed at zero or anywhere close to it. Unlike all the other stock exchanges, the NYSE did not have to break any trades.

The SEC/CFTC report not only does not highlight this success, it wrings its collective bureaucratic hands over whether LRPs might have been responsible for the crash of the other markets. While it concludes that they were not, it does go on to imply that the lack of coordinated – read identical – procedures at all exchanges could well have been a problem. Thus were born the coordinated single stock circuit breakers that, as noted above, have already proved to be an embarrassing failure.

The report also does not highlight the fact that LRPs were something of a throwback to the days when monopolies could be monopolies, when exchanges could adopt their own best ideas for centralizing and coordinating order flow for the good of their customers and their market. While the all-electronic-all-the-time clones objected to LRPs during the comment period leading to Reg. NMS, the SEC allowed them. This was fortunate, because LRPs provided the only defense in the National Market System against the flash crash's doom loop scenario.

The other important flash crash exception was the CME's stop logic functionality, an LRP-like feature in the S&P 500 E-Mini futures market that was critical to stopping the electronic doom loop there. While mentioned in the report, the value of this break from continuous screen trading was not highlighted.

Between them, LRPs and stop logic arrested the declines in their markets and allowed prices to quickly return to where they were before the crash began. The report does not highlight this resounding success. Nor does it highlight the similarity between these functionalities, much less that they were designed not by regulators but by their respective exchanges acting as central markets to promote effective price discovery by taking breaks from continuous electronic screens.

Also not highlighted was the fact that futures markets are still allowed to run as monopolies. In terms of industrial organization, the flash crash was actually a pretty good real-world test of the multi-market competing clone model versus the centralized monopoly model. The clones lost. Any honest reading of the full report would conclude that the futures market performed relatively well and that it was the equities market that failed miserably.

The authors of the report have a vested interest in preventing that conclusion from being drawn. Now that Dodd-Frank promises to give the SEC and the CFTC expanded roles in derivatives and other markets based on their presumed expertise in how modern electronic trading works, it would not do to admit that the antitrust premise on which their regulatory empires are built, is false. So it is not surprising that the report blames the futures market for the crash rather than praises its monopoly structure for stopping it.

Not Just A Board Game

Playing around with the equities market structure as if it were only a closed, self-contained system carries great risk, and not just that it will fail as a system the way it did on May 6. There is also the risk that system externalities equally or more important than the system, itself, will be overlooked.

Capital formation is one such externality. While concept releases and other musings by the SEC on its role sometimes carry perfunctory references to capital formation, little if any actual attention has been paid to whether or how the Commission's market structure reforms might affect this vital function. At most, the simple assertion is made or implied that, if transparency and other NMS goals are attended to, then capital formation will improve as well.

But there is no evidence that it has improved – quite the opposite. Within a year of the reforms hailed by Chairman Levitt, the Nasdaq dealer market began a steep decline in IPOs of new technology companies that continues to this day. The effects on the economy and jobs may have been devastating, as chronicled in a series of recent Grant Thornton articles by David Weild and Edward Kim.

Strictly speaking, IPOs, the economy and jobs may be 2nd, 3rd, 4th or more derivative externalities of the secondary market trading structure the SEC has altered via NMS. Contemplating the compounding complexities implied by such externalities quickly borders on the impossibly infinite. But that is not a reason to stick to the familiar secondary trading field of NMS, with its nicely simple math of tick sizes and its familiar verities like transparency. It is, rather, a reason to avoid interventions like NMS altogether, because it is clearly impossible to predict their consequences, but obvious that they could be severe.

Consider, for example, a U.S. citizen who is both an investor in the stock market and an employee of a company. Why worry only about his trading costs in the market and not about his job? If redistributing trading costs from Wall Street professionals to him via NMS jeopardizes his job, because the professional traders are also tied in with the capital raisers, would he think it was a good trade? Obviously, he might have second thoughts about NMS's alleged fairness if he knew what was at stake.

This is not to suggest that the SEC should take account of such things, but to point out the impossibility of trying to do so. A realization of the complexity of what they're dealing with might engender some humility. Humility, in turn, might bring about an honest evaluation of the National Market System and the Commission's role in promoting it.