

July 12, 2019

Vanessa Countryman, Secretary
Securities and Exchange Commission
100 F Street NE
Washington DC

Re: Release 34-86168; File Number SR-CboeEDGA-2019-012; Cboe EDGA Exchange, Inc.; Notice of Filing of a Proposed Rule Change to Introduce a Liquidity Provider Protection on EDGA ("Filing")

Dear Ms. Countryman:

Thank you for the chance to comment on the Filing. About a month after the Chicago Stock Exchange ("CHX") withdrew a rule proposal for a discriminatory speed bump favoring market makers,¹ Cboe floated its own discriminatory speed bump favoring market makers in the Wall Street Journal.² I'd guess someone in Chicago must have exited an elevator on South LaSalle, walked to another elevator bank, and tried again.

The Filing should fail for all the reasons CHX's discriminatory speed bump ultimately failed, despite some differences in Cboe EDGA's approach. The Filing is an undeserved regulatory subsidy to market makers, an attempt to strengthen advantages for already privileged intermediaries. It is poorly designed, doesn't solve what it pretends to solve, and innocent market participants will suffer for it. The proposal also becomes more discriminatory as technology improves and will undermine the vital pro-competition market reforms embedded in Reg NMS.

With the Filing Cboe EDGA apparently hopes to launch a new kind of stock exchange it calls an "otherwise automated market," but it is a Frankenstein, a regulatory monster Cboe EDGA stitched together from long discarded practices. Using time and place advantages and pieces we might call an "otherwise manual quote" and an "otherwise protected quote" that resurrect locked and crossed market strategies, practices regulators thankfully condemned more than a decade ago, this creature should not be allowed back into the National Market System. Cboe EDGA's attempt here to introduce a hybrid manual/protected quote contradict the plain language of the Reg NMS adopting release and should be rejected.

A little history

The Filing comes to us from an exchange with an unhappy history. Just four years ago EDGA made exchange history when it settled a matter with the SEC where the SEC found EDGA did not completely and accurately describe an order type or its underlying functionality in its rules, but instead provided complete and accurate information about that order type to some, but not all, of its members.³ After a round or two of acquisitions, the exchange is now part of an exchange group with its own unhappy history. Just six years ago Cboe itself made U.S. exchange history when it was assessed the first financial penalty "against an exchange for violations related to its regulatory oversight."⁴ The SEC's order

¹ Letter from Albert J. Kim, Chicago Stock Exchange, to Eduardo J. Aleman, Assistant Secretary, Securities and Exchange Commission, July 25, 2018.

² "New 'Speed Bump' Planned for U.S. Stock Market," Alexander Osipovich, Wall Street Journal, August 31, 2018.

³ Securities and Exchange Commission, Administrative Proceeding File No. 3-16332, In the Matter of EDGA Exchange, Inc. and EDGX Exchange, Inc., Order Instituting Administrative and Cease-and-Desist Proceedings Pursuant to Sections 19(h) and 21C of the Securities Exchange Act of 1934, Making Findings, and Imposing Remedial Sanctions and a Cease-and-Desist Order, January 12, 2015.

⁴ "SEC Charges CBOE for Regulatory Failures," Press Release, Securities and Exchange Commission, June 11, 2013.

in that case found that "CBOE's failures cut across all aspects of its regulatory, business and exchange operations."⁵

While these matters are closed and we are a forgiving nation, I see no reason why regulators or the public should take any but the most benign proposals from Cboe EDGA on faith. That's especially true of the Filing, a proposal with extraordinary implications for the country's public markets, justified by little more than the usual feel-good "market quality" flag-waving. In particular, since the exchange's recent past includes selective disclosure to firms, we should all know exactly which firms it has discussed this proposal with and what was discussed.⁶ And since Cboe's recent history includes "failures cut across all aspects of its regulatory, business and exchange operations," the SEC should not accept any of Cboe EDGA's representations or speculations about this proposal without exhaustive hard data to back them up. Try as I have, I can't find any substantive quantitative analysis in the Filing at all. As far as I can tell, there is just one statistic in its 44 pages and the word "analysis" appears only once; that precious statistical analysis is about crossed markets in just seven stocks on one day in 2018. On this foundation Cboe EDGA wants to transform U.S. market structure?

Carrot cake

In the exhausting trench battle over CHX's speed bump,⁷ a valuable advance came when the SEC's Investor Advocate ("IA") offered its opinion of it.⁸ The IA recommended reversal of the speed bump's approval order because "CHX's proposed rule change is unfairly discriminatory and inconsistent with investor protection and the public interest."⁹

But more important, with prescient commentary foreshadowing the spirit of the Division of Trading and Markets's staff guidance¹⁰ ("Staff Guidance") in light of the *Susquehanna International Group, LLC v SEC*¹¹ decision ("*Susquehanna*"), the IA noted that "The Commission should carefully consider the *weight to be given, if any, to speculative benefits* to overall market quality.... We are concerned, however, that speculation about the potential for market-wide benefits seems to serve as the basis for allowing this

⁵ Securities and Exchange Commission, Administrative Proceeding File No. 3-15353, In the Matter of Chicago Board of Options Exchange, Incorporated and C2 Options Exchange, Incorporated, Order Instituting Administrative and Cease-and-Desist Proceedings Pursuant to Sections 19(h)(1) and 21C of the Securities Exchange Act of 1934, Making Findings and Imposing Sanctions and a Cease-and-Desist Order, June 11, 2013, page 3.

⁶ "'As a leading U.S. securities exchange operator, Cboe is committed to bringing forth new ideas that add value to our ever-evolving markets,' said Bryan Harkins, Executive Vice President, Co-Head of Markets Division at Cboe. 'Our proposed LP2 initiative is the result of vital and ongoing consultation with customers and investors, and we will continue to actively seek out ways to deliver innovative and flexible solutions that best meet their needs.'" From "Cboe Plans to Introduce a New Liquidity Provider Protection Feature on Cboe EDGA Equities Exchange," Cboe press release, June 10, 2019.

⁷ See generally comments on "Notice of Filing of Proposed Rule Change to Adopt the CHX Liquidity Enhancing Access Delay," Release 34-80041, File SR-CHX-2017-04 available at <https://www.sec.gov/comments/sr-chx-2017-04/chx201704.htm> and "Notice of Filing of Proposed Rule Change to Adopt the CHX Liquidity Taking Access Delay"; Release 34-78860, File SR-CHX-2016-16, available at <https://www.sec.gov/comments/sr-chx-2016-16/chx201616.shtml>. In particular, see letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, September 29, 2016 ("Leuchtkafer 1"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, December 14, 2016 ("Leuchtkafer 2"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, March 14, 2017 ("Leuchtkafer 3"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, June 15, 2017 ("Leuchtkafer 4"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, July 10, 2017 ("Leuchtkafer 5"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, October 7, 2017 ("Leuchtkafer 6").

⁸ Memorandum to the U.S. Securities and Exchange Commission from Rick A. Fleming, Investor Advocate, Securities and Exchange Commission, February 27, 2018 ("IA Memo"), available at <https://www.sec.gov/comments/sr-chx-2017-04/chx201704-3169295-161957.pdf>.

⁹ IA Memo, page 3.

¹⁰ "Staff Guidance on SRO Rule Filings Relating to Fees," Division of Trading and Markets, Securities and Exchange Commission, May 21, 2019.

¹¹ *Susquehanna International Group, LLC v. SEC*, 866 F.3d 442 (D.C. Cir. 2017).

significant discrimination."¹² [Emphasis added.] Further, "the potential benefits for retail and institutional investors are too uncertain and speculative to justify a proposal that is discriminatory on its face and where the corresponding obligations of market makers are not sufficient to make the discrimination 'fair.'"

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No doubt Cboe EDGA will plead that its discriminatory speed bump is quickly distinguishable from CHX's. It's true a wolf in sheep's clothing is in some terms distinguishable from a wolf, but don't turn your back. While Cboe EDGA's proposal is to speed bump marketable orders and give resting orders a four millisecond advantage, it is entirely out loud that "market makers are the most likely to benefit."¹⁴ Cboe EDGA speculates that "the proposal would protect a wide range of orders that provide liquidity to the market, and thereby promote better market quality"¹⁵ but provides absolutely no firm details on what that "wide range of orders" is, where it comes from, what its current mix of professional, retail, and institutional resting orders looks like, and specifically what improvements to market quality Cboe EDGA expects when its discriminatory speed bump is in place.

As just one example of what's missing, we don't know what percent of the time a retail or institutional resting order is at Cboe EDGA's best price in, say, SPY, what percent of its quoted volume retail and institutional interest is, and, most important, what percent of retail and institutional investors are capable of using that four millisecond speed bump to reprice their orders in response to the rapidly unfolding "market conditions" Cboe EDGA is worried about.¹⁶ If anyone is to believe the proposal will protect a *wide* range of orders, and not just market makers, Cboe EDGA needs to specifically address how someone like Mrs. Betty Johanssen of Red Lake, Minnesota, can use that proposed speed bump to observe a tick in the futures markets in Chicago and dodge adverse selection by repricing her one lot in MMM, because that's the sheep's clothing. If Cboe EDGA won't or can't, all we're left with is the wolf. So let's suspend proceedings on this rule filing and wait with interest for Cboe EDGA to talk to Mrs. Johanssen about her network infrastructure and feed handlers, and hope she invites us all to have a piece of her famous carrot cake while she shares those details.

Susquehanna

Susquehanna and the Staff Guidance resting on it give us a useful roadmap for the kind of scrutiny to bring to the Filing. As we know, in *Susquehanna* the District Court didn't limit its opinion's applicability to the specifics of the rule filing litigated there. Its opinion applies broadly to all rule filings, and presumably we can use the Staff Guidance as a map for the SEC's expectations of the details SROs should provide in every SRO's proposed rule change. I won't presume to offer an exhaustive discussion of what those expectations might be here, but let's look at just Section III.A of the Staff Guidance.

Section III.A says a 19b-4 filing should include a "discussion of the benefits to investors and market participants of the new product or service or any changes thereto." The Filing states its purpose is to "make better markets" and "enhance market quality" and "provide a fair and orderly market."¹⁷ As I look through the rest of the Filing, however, I can't find any quantitative detail about Cboe EDGA's current marketplace or about exactly how all those noble goals will be achieved if the proposal is implemented.

The Filing fails in form and substance right here. Let's go on anyway. Section III.A of the Staff Guidance also says filings should include "a discussion of the benefits to investors and market participants" and includes an example making it quite clear a filing must include specific data about those benefits. The

¹² IA Memo, pages 8-9.

¹³ IA Memo, page 10.

¹⁴ Filing, page 32.

¹⁵ Filing, page 32.

¹⁶ "The proposed delay mechanism is designed to give liquidity providers the ability to update their quotes in response to changed market conditions (e.g., a price change in a futures contract) before trading at stale prices." Filing, page 33.

¹⁷ Filing, page 2.

example is of a proposed product or service that might be faster than an existing one, and details the kind of data staff expect about it - throughput, latencies, and peak processing capacity. Adapting those metrics to the Filing, we might expect quite thorough and explicit data about Cboe EDGA's market today, including exhaustive detail about its current quote composition (retail, institutional, market maker, and other professional) and quote quality (time at inside, quantity at inside, effective spreads, queue size, among others). Since the Filing laments that its participants (presumably retail, institutional, market maker, and other professionals) are being picked off by latency arbitrageurs, we would expect exhaustive detail about that, including how often they're picked off and in what names, actual adverse selection costs by participant category, and whether price discovery in those names is dominated by futures markets in Chicago and if so what percent of price discovery is actually in Chicago. We'd also expect details about whether Cboe EDGA's participants getting picked off have any capability at all to take advantage of the speed bump. For example, of the participants suffering latency arbitrage, who among them process the Chicago Mercantile Exchange's data feeds, maintain links between Chicago and New Jersey, and will deliver signals benefitting from the proposed four millisecond speed bump? And who won't? Basic stuff.

Section III.A also points out that when a fee filing changes participant economics, the filing must discuss "the expected difference between current and proposed fees for different types of market participants." Adapting those metrics to the Filing, we would expect Cboe EDGA to (a) detail latency arbitrage costs by participant category (retail, institutional, market maker, and other professional), (b) detail who among those participant categories is positioned to take advantage of the speed bump and who isn't, (c) what Cboe EDGA predicts participants who are able to take advantage of the speed bump will save by avoiding latency arbitrage, (d) what quote quality improvements Cboe EDGA will realize because of it, (e) what those quote quality improvements will save participants by participant category, (f) to what extent the Filing will shift latency arbitrage costs among participant classes, and particularly whether the Filing will shift those costs to participants who don't have the ability to take advantage of the speed bump.¹⁸

There's more, but that's a good start. And we haven't even got to Section III.B.3 of the Staff Guidance.¹⁹ Or Section III.B.4.²⁰

Cboe EDGA justifies its four millisecond speed bump by noting that price discovery for its market often happens in the Chicago futures markets. It then notes that the fastest networks between Illinois and Secaucus, New Jersey (where it hosts its matching engines) transport data in approximately four milliseconds while more pedestrian networks operate at approximately 7.8 milliseconds.²¹ The Filing implies that all its market makers use the slower networks while all the latency arbitrageurs use the faster.

I've yet to see market makers selling apples outside Cboe EDGA's data center in Secaucus to make ends meet, but Cboe EDGA says some participants suffer when they're picked off by latency arbitrageurs getting to stale quotes on its market faster than those participants can reprice those quotes. How Cboe EDGA knows this is not clear. Presumably some market participants have said so but the Filing is silent about who is picked off and how much they're suffering, and it's silent about how Cboe EDGA knows this is because of distant intermarket cross-product latency arbitrage or whether it's from some other cause.

As we know, in *Susquehanna* the District Court made it clear that an agency must do its own fact-finding and not delegate that responsibility to a regulated party. As far as I can see with the Filing, however, Cboe EDGA - the regulated party here - hasn't presented any *facts* but has instead made sweeping representations almost certainly based solely on the sweeping representations of one or more of its

¹⁸ That is, the "Three Stooges Test," discussed in Leuchtkafer 4 at page 9 and also included later here.

¹⁹ "To the extent that the proposed fee or rebate does not affect or apply to all market participants equally, the SRO must explain how this disparate treatment nevertheless complies with the concept of equitable allocation."

²⁰ "To the extent that the proposed fee applies differently to various types or sizes of market participants, advantages or disadvantages a specific type of market participant, or targets a specific market participant or small number of market participants, the SRO must explain why the fee is not unfairly discriminatory."

²¹ Filing, note 10 on page 6.

unidentified customers, fact-finding twice removed from the SEC's hands. It is not for me to say but nevertheless hard to imagine how the SEC can do any reasoned analysis of the Filing consistent with *Susquehanna's* demands.

Speed bumps redux

I've suggested three reasons to reject speed bump proposals:²²

The SEC should reject speed bumps implemented in software because of the indeterminacies inherent in software-imposed speed bumps.

The SEC should reject speed bumps explicitly or implicitly favoring any particular class of participants.

The SEC should reject speed bumps left to an exchange's discretion to implement or withdraw on a security-by-security basis.

The third point doesn't seem to apply to the Filing, but the first two apply very well.

The SEC should reject speed bumps implemented in software because of the indeterminacies inherent in software-imposed speed bumps.

Speed bump indeterminacies are categorically unacceptable, especially when the speed bump is explicitly or implicitly designed to give a subset of professional traders an advantage and disadvantage other participants. This is the second exchange proposal I can think of in more than a decade designed to privilege a certain class of professional trader with time preferences. (The first was CHX's abandoned speed bump.) It deserves the strictest scrutiny. It's not enough to build a facility like this using reasonable or even best efforts. The indeterminacies inherent in a speed bump implemented in software are significant enough to all but rule out any software-based speed bump, and especially a discriminatory speed bump.

Cboe EDGA will no doubt plead its discrimination is against marketable orders, not participants, and marketable orders come from all kinds. That makes the problem worse, not better. It's an odd defense that your discrimination is admirable because you'll do it to anyone, anytime, depending in large part on the virtually un-auditable precise state and performance of your order book and market data technology stacks at the moment. The problem here is aggravated by the likelihood that Cboe EDGA will have multiple software-implemented speed bump queues, distributed by security or by ranges of securities, each with its own potential for delays of unpredictable length. The problem is also aggravated by the likelihood that highly correlated securities will almost certainly be distributed among multiple software-implemented speed bump queues, so the possibility of intra-exchange latency arbitrage raises its head. The problem is even further aggravated by the immediate proximity of three sibling stock exchanges in the data center, none of which is speed bumped, suggesting the bitter irony that in trying to defeat one kind of inter-exchange latency arbitrage Cboe EDGA could enable a different kind of it.²³

Cboe EDGA's speed bump is superficially intended to address a disparity among its participants, that some participants use faster networks from Illinois to New Jersey than others. According to Cboe EDGA the difference is four milliseconds and the Filing is crafted to address that difference. Any delay in queueing and releasing marketable orders worsens the discrimination against them and sweetens the advantage to participants in the book. What does the Filing say about that? It says "After the delay period, incoming orders, cancel, and cancel/replace messages that have been delayed by the delay mechanism would be processed after the System has processed, if applicable, all messages in the

²² See Leuchtkafer 1, Leuchtkafer 2, Leuchtkafer 3, and Leuchtkafer 4.

²³ See Leuchtkafer 1, page 5.

security received by the Exchange during such delay period. As a result, a message may be delayed for longer than four milliseconds depending on the volume of messages being processed by the Exchange."

²⁴ But *contra* the spirit of Section III.A of the Staff Guidance there are no indications of "delay mechanism" capacity.²⁵ Milliseconds matter. The Filing is predicated on that. Will Cboe EDGA go offline if the delay mechanism underperforms? Will it notify participants? Will it compensate them for their losses? As far as I can tell if a delay mechanism collapses all anyone might get is a wave of the hand and a hearty good luck.

Any malfunction or delay in the speed bump software will give privileged participants an even greater time advantage over other participants without, apparently, any recourse. While it's true there can be unpredictable delays in every market, there are several important ways to distinguish the Filing. Outside of IEX's and NYSE American's 350 microsecond delays, I'm unaware of any other exchange rule with a hard time threshold like this. Unlike Cboe EDGA's proposed delay, IEX's delay simulates a geographic delay by using uninterrupted coils of fiber, so from the time a message enters the coil until the time the message exits the coil, so long as the known laws of physics continue to apply, the coil will impose a 350 microsecond delay in every case, wholly independent of front- or back-end congestion and wholly independent of whatever networking technology a participant has used to reach the exchange. There may well be congestion in front of the coil or behind the coil, but the coil itself will only ever impose a 350 microsecond delay, which is precisely what IEX's rules dictate.

Even if this were not the case, and for some reason IEX's coil introduced delays longer than 350 microseconds, that delay would apply universally to every message sent down the coil to its market. No one will get an advantage on IEX if there's a delay. IEX doesn't sort inbound messages into or away from a speed bumping software queue based on the state of its book or the market, states which might be stale when an inbound message is examined, all depending on how these functions are designed and implemented at Cboe EDGA. The more logic an exchange imposes on its speed bump, the deeper a speed bump is embedded within an exchange system, the more opportunities there are for delays and queuing. We don't have any technical specifications for the Filing, so we can't assess just how many new opportunities there are for these delays, but it's obvious there could be many more opportunities than however few - or none at all - there might be in sending a message down a simple coil of fiber.

So far as I know, when exchange networks today experience delays and queuing, for the most part every similarly situated message on its way to an exchange matching engine suffers equally regardless of whether the affected order is marketable or not. Depending on technical implementation details for the Filing, it may well be that there are one or more ways in which *only* the messages for aggressively priced orders under the Filing suffer delays and queuing while messages for non-marketable or resting orders speed along, giving Cboe EDGA's market makers an even bigger time advantage than four milliseconds. We don't have any details on how - or whether - Cboe EDGA will even monitor for these conditions. Different stocks could easily see different delays depending on load or deployment details like server characteristics, system architecture, or other factors. We could see IBM cruise along with a four millisecond speed bump while HPQ suffers from a six millisecond speed bump. PFE could suffer from a seven millisecond speed bump while BMY has only a five millisecond speed bump. No one knows. No one can know. And Cboe EDGA doesn't tell us at what point it believes delays in its proprietary software speed bump become impermissibly obstructive.

For all these reasons any exchange proposal for a speed bump implemented in software should, at minimum, see the strictest regulatory and technical scrutiny, should include detailed implementation specifications, should outline precisely how and when the exchange will surveil its speed bump and remediate and notice any failure, and the SEC should always encourage the exchange to solve its

²⁴ Filing, note 11, pages 6-7.

²⁵ About a proposed technology improvement or service, Section III.A of the Staff Guidance says "the filing should describe the expected maximum throughput, and the improvement offered, including in a clear description the potential improved speed or latency (*i.e.*, in microseconds or the finest applicable measure) during peak periods."

problems through universally applied hardware-based speed bumps or other means, if at all possible. It's true that delays exist in every market but that's no reason for an exchange to add even more ways its systems can queue and delay, especially when asymmetric queuing and delays will largely benefit an already privileged class of market participants.

But - but - Cboe EDGA will mark its quotes as manual quotes.²⁶ Presumably, then, unpredictable behavior from its delay mechanism is more acceptable than it would be anywhere else. But then Cboe EDGA fudges what a manual quote was intended to be and begs to be allowed a hybrid manual/protected quote, allowed to lock and cross other manual quotes, and even allowed to lock and cross protected quotes through a special flickering quote status.²⁷ That storyline begins when Cboe EDGA describes its future self as "an otherwise automated market ... disseminating a manual quotation due solely to its introduction of a short intentional access delay on incoming orders."²⁸ The new regulatory category here of an "otherwise automated market" is a breathtaking novelty. We might consider similar categories like "otherwise broker/dealer" or "otherwise investment adviser" or "otherwise securities exchange" and wonder what they might mean to the country. More on all this later.

The SEC should reject speed bumps explicitly or implicitly favoring any particular class of participants.

Historically, intermediaries have been given regulatory subsidies to encourage them to maintain continuous, aggressive quotes in all market conditions, and to compensate them for adverse selection when they do. The Filing's pernicious novelty is that it grants a regulatory subsidy to help these intermediaries avoid adverse selection altogether, affecting market quality, volatility, transaction costs, and competition.

But - but - Cboe EDGA offers this regulatory subsidy to all resting orders. That falls apart when we understand just who can take advantage of the speed bump: firms with the sophistication, resources, infrastructure, and business models that are helped by it. In other words, high frequency market makers.

A central policy objective of the SEC's market reforms in the last two decades - and in particular, of Reg NMS - has been to *eliminate* asymmetric delays favoring market intermediaries,²⁹ and we can all agree that market quality has steadily and materially improved since the 1990s, though some exchanges, particularly those with monopolies or near-monopolies, suffered along the way. (For example, NYSE saw its market share in its own listed stocks drop from 80% to 20%.) Other markets were created and grew, though, by leveraging regulatory subsidies like Reg ATS, the Order Handling Rules, and in particular Reg NMS (and to a limited extent ITS plan trade-through prohibitions before Reg NMS was implemented), and, on the whole, market quality improvements from the late 1990s to today are dramatic and undeniable. Eliminating asymmetric delays vastly improved quote and market center competition, provided overdue safeguards against exchange monopolies, and significantly lowered often insurmountable barriers to entry for market participants and market centers alike.

In the Filing, Cboe EDGA argues that it needs to reinstate asymmetric delays favoring market intermediaries to improve its market quality. That argument contradicts long-held public policy, defies the experience of the last 20 years, and defies recent empirical research on market behavior.³⁰

²⁶ Filing, page 8.

²⁷ See Filing, pages 13-14 and page 17.

²⁸ Filing, pages 13-14.

²⁹ For example, the manual handling of orders by exchange specialists was little more than a particularly excessive asymmetric delay favoring market intermediaries. When it created protected quotes, Reg NMS removed that asymmetry. By reinstating an asymmetric delay, Cboe EDGA's proposal attempts to undermine that central policy objective of Reg NMS in order to benefit intermediaries.

³⁰ For discussions of how extremely rapid quote withdrawals by intermediaries can negatively affect market quality in stressed market conditions, see data-driven research summarized in Leuchtkafer, "High Frequency Trading: A Bibliography" (2019) available at <https://blog.themistrading.com/2019/03/2019-bibliography-of-adverse-effects-of-hft-studies-research-press/>. In

Larry gets socked

During the CHX speed bump controversy, the SEC solicited responses to questions it had about the effects of CHX's plans.³¹ I've included many of those important questions and my responses and then adapted them, as below:

How would the proposal affect price volatility during stressed trading conditions?

Volatility will increase in stressed trading conditions.³² That's the entire point of the Filing, to allow market makers to withdraw their quotes ahead of other market participants - intuitively, something they're most likely to do in stressed trading conditions - which will inevitably increase volatility. It is an unfortunate fact for market intermediaries but true: adverse selection dampens price volatility. That fact is the *entire* purpose of regulatory subsidies for the industry, to compensate intermediaries for dampening volatility when they intentionally (or unintentionally) adversely stand at a price. From generous capital rules to Reg SHO exemptions to preferred pricing, intermediaries receive fistfuls of regulatory subsidies to reward them for making markets in stressed trading conditions. Bizarrely, Cboe EDGA proposes to give already privileged intermediaries a tool to flee stressed markets yet keep all their other subsidies, entirely upending the public policy objectives of those subsidies in the first place. The proposal will exacerbate volatility by design.

And by enabling its privileged intermediaries to flee adverse selection, the proposal shifts the costs of adverse selection onto other participants who can't leverage the speed bump and are still foolish enough to leave resting orders on Cboe EDGA's book. It will also shift those costs to exchanges which don't have a discriminatory speed bump. Speed bumps should at least pass a simple Three Stooges test: If Moe throws a punch at Curly, Curly ducks, and Moe hits Larry on the follow-through, Curly is spared but Larry gets socked.³³ Since asymmetric speed bumps like this only change who gets socked, they fail the test.

The most affluent and sophisticated market makers can flee price volatility while institutions, retail customers, and other professionals stay exposed, and are then disproportionately adversely selected. Cboe EDGA's proposal doesn't cure latency arbitrage, real or imagined, it merely shuffles who suffers from it, and ironically the victims here will be market participants who *don't* use the fastest and most expensive technology and exchanges who *don't* deploy a discriminatory speed bump. As a principle, asymmetric delays favoring resource rich market intermediaries will increase the value of all their other regulatory subsidies while they shift costs to, extracting rents from, unsubsidized and resource poor market participants.

How would the proposal affect transaction costs for retail and institutional investors?

Transaction costs for retail and institutional customers will increase. See the discussion above. Most important, asymmetric delays which favor market intermediaries disadvantage

particular, for a study of the market quality effects of an asymmetric delay nearly identical to the one proposed in the Filing, see Chen, Foley, Goldstein, and Ruf, "The Value of a Millisecond: Harnessing Information in Fast, Fragmented Markets," (2017), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2860359 ("Chen"). More on "The Value of a Millisecond" later.

³¹ Release No. 34-80740, File No. SR-CHX-2017-04, Chicago Stock Exchange, Inc., Order Instituting Proceedings to Determine Whether to Approve or Disapprove a Proposed Rule Change to Adopt the CHX Liquidity Enhancing Access Delay ("CHX Order").

³²See note 30.

³³ See a clip of Moe, Larry, and Curly at <https://www.dailymotion.com/video/x4yvnf2?start=150>.

retail and institutional investors, further exposing them to adverse selection and inevitably discouraging them from posting limit orders altogether.

How would the proposal affect an institutional investor's experience providing liquidity and removing liquidity on [Cboe EDGA]?

As in the discussions above, the proposal will further expose any unprivileged liquidity provider to adverse selection by enabling market makers to withdraw more quickly than other participants. Every investor demanding liquidity, including institutions, will always be at risk of chasing a "maybe quote" because market makers can advantageously withdraw in front of them.

Would the proposal provide an unfair advantage to [market makers] providing liquidity vis-à-vis other liquidity providers and in particular when the price of a security moves?

Yes, by design. The proposal lets market makers avoid adverse selection while disproportionately exposing all other participants to it. It also enables them to be first at a price during rapid price moves while other participants suffer inferior order book queue position. In this way the proposal shifts costs to other participant classes in unfavorable conditions and restrains competition by enabling market makers to capture more revenue when conditions are favorable to liquidity providers.

Do commenters agree with the Exchange's assertion that the proposed rule change would increase displayed liquidity on the Exchange?

At best, it might increase displayed liquidity only in calm markets, and then only for a short time after implementation. As in the preceding discussions, resource poor market participants will suffer from increased adverse selection and poor order book positioning, and will inevitably fall away, leaving behind only the most sophisticated and affluent professionals as willing and able to quote.

According to several commenters, liquidity provided by [market makers] would be "fleeting" because they could update their quotations while incoming orders are delayed. Do commenters agree? If so, what are commenters' views on how significant "fleeting" liquidity would be in comparison to the overall liquidity provided on the Exchange?

As above, market makers will have a material time advantage over every other participant class, restoring "maybe quotes" to the National Market System, enabling market makers to stand in calm markets and flee in volatile markets. On average calm markets prevail, but liquidity is needed most during volatile markets, and it is in volatile markets market makers "maybe quotes" will be the most obvious and costly to other participants.

How would the proposal affect the national market system if exchanges with a larger percentage of overall trading volume were to adopt a similar proposal? In particular, how would the proposal affect market quality?

By shifting adverse selection costs to other participants and by enabling market makers to get superior order book queue position, the proposal will warp transaction costs and industry economics enough to discourage resting limit orders and fend off competition. The combined effect of that will be to accelerate any consolidation we already see among liquidity providers and to accelerate institutional migration to dark trading venues. The combined effect of *that* will be to substantially reduce market quality over time as quote competition declines, displayed limit orders evaporate, and market volatility increases.

One of the stated goals of the proposal is to minimize the effectiveness of latency arbitrage strategies. What metrics would help determine if latency arbitrage is currently a problem on [Cboe EDGA]? Is [a four millisecond delay] necessary to minimize the effectiveness of latency arbitrage strategies? Should the delay be shorter or longer to accomplish this goal? Is the [four millisecond] delay appropriate for trading at [Cboe EDGA's] data center? Why or why not?

As above, the proposal doesn't minimize latency arbitrage, it merely changes who suffers. But this question begs another question. If Cboe EDGA's proposal is justified by a latency difference between a fast microwave connection to Chicago and slower fiber connections, what does Cboe EDGA propose to do as and when its market makers upgrade to microwave? Will it even monitor for it? Will it route any improved market makers into its speed bumping software? From inception, will it route market makers already using microwave into the speed bump? If not, this proposal extends an even greater advantage to sophisticated firms than it pretends to do as technology improves and market makers take advantage of that.

Does the proposal's protection against latency arbitrage strategies for [market makers] warrant the benefits of the delay?

No, because, as discussed above, it will increase costs for other participant classes, discourage nonprofessional resting limit orders (both on Cboe EDGA and nondiscriminatory competitor exchanges), and inhibit liquidity provider competition. It also appears to be a permanent subsidy regardless of whether a market maker is, in fact, vulnerable to the latency arbitrage strategies the Filing says it's concerned about.

Is the delay short enough that it would not harm liquidity takers or providers other than those engaging in latency arbitrage?

As discussed above, the proposal will harm market participants of all kinds and nondiscriminatory exchanges of all kinds. Any asymmetric delay harms participants who can't take advantage of the delay and exchanges who treat all participants equally.

What are commenters' views on how the proposal would affect liquidity providers on [Cboe EDGA] as well as liquidity providers on other markets?

The proposal will concentrate latency arbitrage costs on less sophisticated participants of all kinds, including retail, institutional, and professional participants. Funny enough, Cboe EDGA stipulates to this, writing that latency arbitrage acts as a tax on liquidity provision.³⁴ A logical conclusion, holding latency arbitrage strategies constant, is that it will simultaneously increase the cost of providing liquidity to anyone who can't take advantage of the four millisecond speed bump. At the same time, the proposal will even further inhibit liquidity provider competition on Cboe EDGA because market makers can use their time advantage to obtain superior order book queue position when they want it (by cancelling exposed orders and repricing away to soon-to-be best prices), concentrating latency arbitrage costs on other participants and exchanges and depriving other participants and exchanges of revenue, and raising barriers to entry even higher. This flaw might be addressed, at least in part, by giving market maker orders lowest priority at a price, but Cboe EDGA doesn't plan to do any such thing.

³⁴ Filing, page 3.

The creature

Implicitly, Cboe EDGA will give its market makers an exclusive handle on price discovery, ahead of all other participants, just as, back in the bad old days, stock exchange specialists had an exclusive handle on price discovery. Cboe EDGA will reanimate one of the most controversial aspects of the exchange specialist model without requiring anything in return.

As we know, stock exchange specialists were given enormous regulatory privileges. Their main privilege, their main regulatory subsidy, was their exclusive view of price discovery. The economic value of that view came from all the information specialists harvested before other participants could see and react to it. In yesterday's manual markets that regulatory subsidy lasted through the trading day, with information disseminated in fits and starts over top-of-book quote feeds and last sale reports. Cboe EDGA's discussion in the Filing of how and why it intends to privilege certain market participants and discriminate against others, tells us that Cboe EDGA recognizes that, at minimum, price discovery doesn't always happen in its own book but at other market centers. CME in particular seems to be a focal point for price discovery in Cboe EDGA's market, but there are no doubt other venues, including one or more of the exchanges hosted nearby in New Jersey. Four milliseconds might be just enough to equalize microwave and fiber transit times between Chicago and the east coast, but it is a lifetime within the network of exchange data centers in New Jersey, bestowing extraordinary time advantages on Cboe EDGA's market makers relative to other participants on those equities markets.

And so if it looks like an old-time specialist, walks like an old-time specialist, and talks like an old-time specialist, it should be regulated like an old-time specialist. If Cboe EDGA wants to revive the specialist model on its market, Cboe EDGA must demand meaningful affirmative and negative obligations from them. It must obligate them to maintain fair and orderly markets with more than the perfunctory performance standards now on its books, must prohibit them from destabilizing trades on any market, and must make them yield to agency orders at a price.

IEX built its 350 microsecond speed bump - a threshold determined solely by the geography of the National Market System's largest data centers - so the *exchange* could reprice everyone's hidden orders and protect them from getting picked off at stale prices, but Cboe EDGA's speed bump will privilege Cboe EDGA's nouveau specialists. That's all because, at least for now, Cboe EDGA says these downtrodden firms have lost the speed arms race against other firms and Cboe EDGA wants to give them a boost. While IEX's 350 microseconds are because of a fixed and unchanging (or very slowly changing) issue - data center geography - Cboe EDGA justifies its four milliseconds either "Because: IEX" or by a relative and almost certainly changing issue, a speed arms race disadvantaging firms using fiber against other firms using microwave, and only if and when the microwave firms respond to market conditions on the CME. So if and when Cboe EDGA's market makers leverage advanced technology and use microwave, or if and when other firms slow down or even exit, or if and when market makers respond to market conditions in, say, New Jersey instead of Chicago, does Cboe EDGA have any plans to adjust its speed bump? If not, why not?

The creature's bride

Cboe EDGA wants its new marketplace to have unique powers in the national market system. The Filing proposes that even though Cboe EDGA will delay marketable orders, and even though it will publish a manual quote, its quotes are special and should act like pseudo-protected quotes. It wants permission for its quotes to lock and cross other manual quotes and to stand their ground against away protected quotes for a full second, locking or crossing them too. This is all because Cboe EDGA claims it is a new species, an "otherwise automated market." Let's disassemble these proposals to understand them and to see who might benefit from them.

Under Reg NMS, a manual quote is any quotation which is not "immediately and automatically accessible"³⁵ and a protected quote is one which is immediately and automatically accessible. As I argued in the IEX approval process, the intent behind a "protected quote" wasn't to guarantee instantaneous execution but to firewall human intervention ahead of execution.³⁶ The SEC accepted this interpretation.³⁷

Under the Filing, Cboe EDGA's manual quotations contain the prospect of human intervention *after* an order has been received by the exchange but *before* that order is executed. That intervention is encoded in participant algorithms, which makes it faster but no less of an intervention than if a guy named Tommy did it. Discretion isn't somehow scrubbed away because it's contained in software. Here's an example:

- A. TOMMY: If we ain't good, I'm backin' out.
- B. ALGORITHM: if (sux == mktcond()) backout();

To justify exemptive relief for its manual quotations, Cboe EDGA needs a convincing argument of how the discretion embedded in the software of (B) is materially different from the discretion embedded in the "wetware" of (A). It also needs to explain why delaying marketable orders on receipt to give participants time to exercise discretion isn't exactly what the Adopting Release contemplated when it defined a manual quote. There is no explanation of this in the Filing just as there is no such thing as an "otherwise automated market." Crucially, it doesn't matter that participants won't see marketable orders in Cboe EDGA's queue because they'll often enough see their brethren trading on other markets. More crucially, in defining a manual quote, the Adopting Release doesn't stipulate participants on an exchange have to first see an arriving order, but only that they can exercise their discretion at any time *after* an order has arrived at the exchange and *before* it is executed:

First and most importantly, Rule 611 protects only immediately accessible quotations that are available through automatic execution. It does not require investors submitting marketable orders to access "maybe" quotations that, *after arrival of the order, are subject to human intervention and thereby create the potential for other market participants to determine whether to honor the quotation.*³⁸ [Emphasis added.]

The language is broad and quite clear. Cboe EDGA's fanciful "otherwise automated market" is fiction. It's nothing but a version of the old-fashioned specialist market, giving its participants plenty of opportunity to advertise quotes but then back away as they wish, how they wish, when they wish. If this is how Cboe EDGA now hopes to run its business all it's entitled to is a simple manual quote.³⁹

Though the Filing talks about the futures markets in Chicago, likely the real action is all the other equities markets in New Jersey, and four milliseconds is more than enough time - 50 times or more what's necessary - to respond to the other equities exchanges hosted in Secaucus, Mahwah, and Carteret. In other words, it's difficult not to interpret the Filing as a trojan horse that uses the geographical latencies between Illinois and New Jersey to give its market makers an enormous time advantage over the nearby equities markets. One enormous benefit is to fade in front of any action it sees on the away equities markets as smart order routers sweep displayed liquidity.

³⁵ Reg NMS adopting release, Exchange Act Release No. 3451808, June 9, 2005, page 1. ("Adopting Release")

³⁶ Letter to Brent J. Fields, Secretary, SEC from R. T. Leuchtkofer, February 19, 2016. ("Leuchtkofer 7").

³⁷ "Notice of Proposed Commission Interpretation Regarding Automated Quotations Under Regulation NMS," Release 34-77047, March 18, 2016.

³⁸ Adopting Release, page 119.

³⁹ To be clear about it, I am not arguing a marketable order in a speed bump queue has been "presented" to a market maker, as with Rule 602. Under the Adopting Release and for the purposes of determining whether an exchange is entitled to publish anything more than a conventional manual quote, however, an order has "arrived" at an exchange if (a) it is held in an exchange's speed bump queue while (b) other market participants can still determine whether to honor their quotations before that order is released for execution.

To really seal its advantage, though, its quotes must be somehow more than common manual quotes in the National Market System. If its pseudo-protected quote is approved, imagine a scenario where Cboe EDGA has posted a manual quote and is then locked or crossed by an away market's protected quote. What's happened? Someone at the away market has determined a matching or better price and elected not to route to Cboe EDGA. If allowed to do it, Cboe EDGA's wants to stand for a full second. Depending on exchange fees, a third party could clear the lock and pocket a rebate. Even sweeter would be to clear a crossed market, pocket a rebate, and earn a riskless spread. Who's behind the quote on Cboe EDGA? It's hard to imagine it's a professional order and easier to imagine it's an institutional or retail order, unsophisticated enough to know prices have changed and unable to respond quickly enough even if they do know it. Who's going to have the exchange fee advantages and technological sophistication to clear these locks and crosses? It would be simpler to have the Council of Institutional Investors and Mrs. Johanssen just write monthly checks to the FIA's Principal Traders Group.

Finally, it isn't clear whether Cboe EDGA expects to receive market data revenue for its manual quotes. Reg NMS is quite clear that "only automated and fully accessible quotations will be entitled to earn a share of market data revenues"⁴⁰ If the SEC approves the Filing and grants Cboe EDGA exemptive relief, it should absolutely exclude Cboe EDGA from earning quote credits under the simple justification that Cboe EDGA's quotes are at best conditionally accessible.

Research

There are few things new under the sun, and an asymmetric speed bump is not new. Canada's market has hosted a market center with an asymmetric speed bump for several years, long enough for academics to research its effects.⁴¹ The results on that market, TSX Alpha, aren't encouraging. Researchers found:

We provide the first empirical evidence on the impact of intentionally slowing down some participants in a fragmented environment and document a key insight into what drives fleeting liquidity in today's fast, fragmented markets: participants with speed advantages are able to observe (large) traders' actions on other venues, cancelling standing limit orders faster than traders are able to access them. Our evidence suggests that advance knowledge – even for a millisecond – of institutional investors' trading intentions (in a probabilistic sense) is valuable: delays as short as one millisecond can enable substantial (costly) information leakage across venues.

We start with a detailed analysis of the behavior of liquidity providers on Alpha, including their usage of the delay-exempt order type and the ability of liquidity demanders to access liquidity across venues. Using several newly developed metrics, we show that low-latency liquidity providers on Alpha use the delay-exempt limit orders to "fade away" from incoming market orders, i.e. cancel their orders on Alpha, after observing executions on other venues. We also observe a redistribution of information content and adverse selection contained in trading volume, with Alpha capturing a larger fraction of low adverse selection volume at the expense of the rest of the market. Large liquidity demanders are less successful on Alpha and execute relatively more on the remaining venues, while smaller orders shift towards Alpha (e.g. driven by the incentives of retail brokers to collect the rebates). As a consequence, the profitability of liquidity provision on Alpha vastly improves, while realized spreads on the remaining venues fall...⁴²

Adverse selection isn't reduced or eliminated, but merely shifts to other markets and to less capable participants. In other words, Curly ducked and Larry got socked. But isn't that the point, to improve

⁴⁰ Adopting Release, page 261, and throughout.

⁴¹ See note 30.

⁴² Chen, page 3.

liquidity provider profitability? Yes, but as the authors warn, "Regulators and market participants should be cautious in approving any mechanism, speedbump or otherwise, which facilitates such conduct, as our results show that it increases total transaction costs and reduces the resiliency of the order book."⁴³

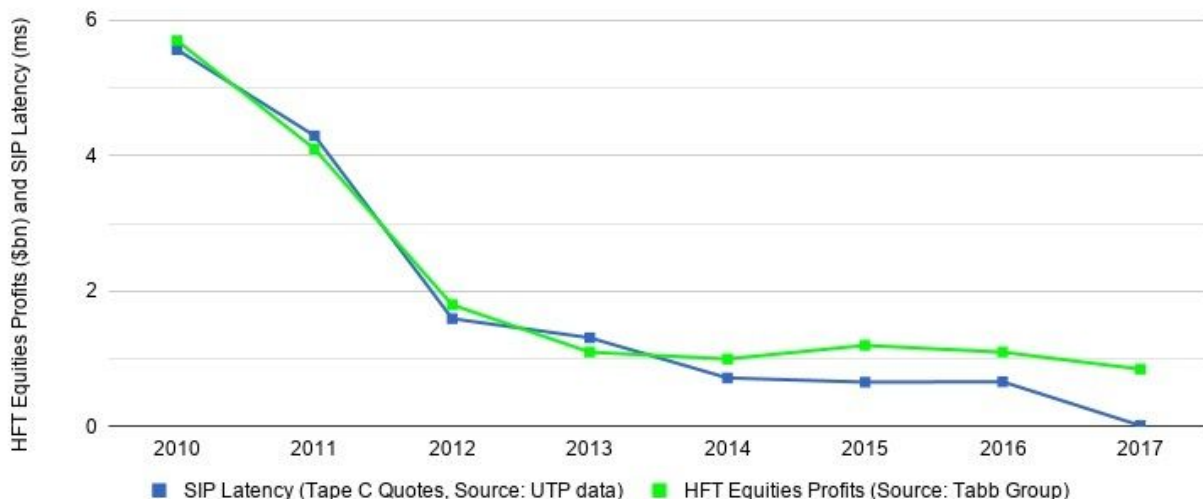
Did quote quality improve? The authors report Alpha "is almost never alone at the best [quote]."⁴⁴ Did adverse selection diminish? "Speed differentials *redistribute* adverse selection....This differential effect will redistribute adverse selection away from the fast market makers on Alpha (who can jump out of the way) to slower liquidity providers on Alpha and on other exchanges."⁴⁵ [Emphasis added.] And:

In addition, inverted maker-taker pricing structure such as that on the new Alpha is shown by Battalio et al. (2016) to be particularly attractive to retail brokers, which choose where to send presumably uninformed (and therefore valuable) retail order flow. Consolidating retail order flow primarily onto a single venue while also creating structures that make the venue less attractive to presumably informed institutional flow is likely to increase market-wide adverse selection, increasing the cost of liquidity. This increase in market-wide adverse selection primarily comes from the increase in information that is created by the speed bump, in that it now allows some market participants (the fast market makers on Alpha) "inside" information on market-wide order flow by providing the market makers a look at the trades on other exchanges.⁴⁶

Disapprove

Not so long ago the industry flatly denied firms engaged in latency arbitrage, or that if they did latency arbitrage was barely profitable. Today latency arbitrage is conventional wisdom. Mostly rent-seeking nonsense, the Filing is notable only as a sign of the extent to which Scott Patterson of the Wall Street Journal, Michael Lewis and his *Flash Boys*, Themis Trading, Nanex, and others were absolutely right all along about the prevalence of latency arbitrage in the markets despite industry denials. But the industry never gives up. We can marvel at Cboe EDGA for trying to use a reform tool - speed bumps - to improve the HFT industry's profits but the SEC should not play along with it.

How much is a millisecond worth to that industry? There is the curious phenomenon that as SIP speeds improved over time HFT equities profits collapsed, all at a rate of approximately \$1 billion per millisecond per year:



⁴³ Chen, page 6.

⁴⁴ Chen, page 11.

⁴⁵ Chen, pages 35-36. See also note 33.

⁴⁶ Chen, page 36.

The insight here is that by using proprietary exchange market data feeds HFT firms received market data much more quickly than anyone who relied on the slower SIPs, and profited handsomely because of it.⁴⁷ To the tune of \$1 billion per millisecond per year advantage, those profits came from picking off lagged prices and fleeing unprofitable market conditions.⁴⁸ No wonder Cboe EDGA wants to give four milliseconds back to its high frequency market makers. We should demand much, much more from them if they ever get that incredible subsidy.

As a study in contrasts, IEX's hardware-based speed bump is highly likely to remain steady even in active markets, is based solely on geography, applied universally, and simply gives the exchange time to receive the freshest prices from the SIPs. No IEX participant gets more time than others to exercise discretion. On the other hand Cboe EDGA's software-based speed bump is likely to vary in busy markets. It is based completely on speculation about the constantly changing, unsupervised, and relative performance of participant networks. It is mainly intended to privilege one class of participants and will disproportionately give that class time to exercise discretion over its quotes after the exchange has received marketable orders against them.

There are other ways for Cboe EDGA to address whatever problem it thinks it has and the SEC could encourage Cboe EDGA to explore them. Cboe EDGA could prohibit latency arbitrage by rule as an unfair trading practice and surveil for it. Cboe itself could use some of its \$400 million or so in annual profits to build a microwave network between Illinois and New Jersey and provide the network at a reasonable price to all comers. Or Cboe EDGA could move its data center to Illinois.

The SEC should disapprove the Filing because:

- It is clearly inadequate in light of *Susquehanna*;
- It is an undeserved regulatory subsidy disproportionately benefitting one class of participants;
- "The Commission should carefully consider the weight to be given, if any, to speculative benefits to overall market quality....We are concerned, however, that speculation about the potential for market-wide benefits seems to serve as the basis for allowing this significant discrimination."⁴⁹
- "The potential benefits for retail and institutional investors are too uncertain and speculative to justify a proposal that is discriminatory on its face and where the corresponding obligations of market makers are not sufficient to make the discrimination 'fair.'"⁵⁰
- It isn't likely to sustain a steady, unvarying time delay in all market conditions;
- Moe, Larry, and Curly.

⁴⁷ Arnuk and Saluzzi, Themis Trading, "Latency Arbitrage: The Real Power Behind Predatory High Frequency Trading," December 4, 2009;

⁴⁸ The industry's explanation for its declining profits is lower volatility. While it's likely confounded by decreased volatility, declining HFT profits correlate more closely to SIP speed improvements. As for any of the usual "correlation doesn't mean causation" objections, descriptions of how SIP latency arbitrage worked go back at least as far as 2009, and this evidence confirms them as well as their prediction that HFT profits would fall as the SIPs got faster. The HFT industry's preferred correlation-is-causation argument that changes in volatility are to blame for falling profits is weaker, particularly in 2012-2016 when volatility was relatively constant but HFT profits continued to collapse as the SIPs continued to speed up. More generally, conclusions based on correlated phenomena have worked out extraordinarily well in such scientific fields as epidemiology. In the law, in the form of circumstantial evidence, correlations can send you to prison as quickly as videotape and DNA evidence do.

⁴⁹ See note 12.

⁵⁰ See note 13.

If the SEC approves the Filing the SEC should:

- Deny any manual quote exemptive relief and prohibit use of a flickering quote exception;
- Insist Cboe EDGA impose much more rigorous affirmative obligations on its market makers and impose appropriate negative obligations on them;
- Cboe EDGA should collect and publish statistics about its market so regulators and the public can judge the effects of its billion dollar subsidies. We should know how well it works and who is really paying for it:
 - For every message Cboe EDGA should timestamp the transaction on receipt, on speed bump entry and exit (if applicable), and on matching engine processing start and finish. Every message should be labelled as market maker or not and as delayable or not;
 - To assess the Filing's impact on competition, Cboe EDGA should also collect and disclose order book queue metrics. The metrics should include the total number of times and the total length of time any market maker's order is ranked first at a price when there were non-market maker orders at that price, the number of times and the total length of time any market maker's order is ranked first at a price when there were other non-market maker orders at that price, and the number of times and the total length of time any non-market maker order is ranked first at a price when there were other non-market maker orders at that price, and the number of times and the total length of time any non-market maker is ranked behind a market maker's order at a price despite being received first but speed bumped;
 - To assess the extent to which the Filing fails the Three Stooges test by merely shifting latency arbitrage costs to non-market maker participants, another anti-competitive effect of the Filing, Cboe EDGA should collect and disclose the number of times a non-market maker's resting order was executed within four milliseconds of any market maker's order cancellation at the same price or better. And then to further assess the extent to which the Filing resurrects "maybe quotes" to our markets, Cboe EDGA should collect and disclose the number of times any market maker's order was cancelled while any marketable contra sat in the speed bump.

Sincerely,

R. T. Leuchtkafer