

March 14, 2017

Brent J. Fields, Secretary
Securities and Exchange Commission
100 F Street, NE
Washington DC

Re: Release No. 34-80041; File No. SR-CHX-2017-04; Chicago Stock Exchange, Inc.; Notice of Filing of Proposed Rule Change to Adopt the CHX Liquidity Enhancing Access Delay ("Filing")

Dear Mr. Fields:

In its first proposal to lavish market makers with new regulatory subsidies,¹ among other sins the Chicago Stock Exchange ("CHX") would have enabled intra-exchange latency arbitrage, a bewildering use of an exchange's regulatory power. CHX stumbles again with this latest proposal. This time CHX risks undoing decades of pro-investor reforms and resurrecting stock exchange specialists. CHX will give them a new name but restore their most valuable privilege, and do it without meaningful checks on their anti-competitive power or predatory appetite.

In my previous comments on CHX's attempt to hand out an asymmetric speed bump, I listed three reasons to reject speed bump proposals:²

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.

Several other commenters made one or more of these points.³ CHX's October 28, 2016 response to comments on its earlier proposal ("CHX Response") conceded at least one of these points, though it disputed others.⁴

¹Release No. 34-78860; File No. SR-CHX-2016-16; Chicago Stock Exchange, Inc.; Notice of Filing of Proposed Rule Change to Adopt the CHX Liquidity Taking Access Delay ("Original Filing").

²Letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, September 29, 2016 ("Leuchtkafer Letter 1"); letter to Brent J. Fields, Secretary, SEC, from R. T. Leuchtkafer, December 14, 2016 ("Leuchtkafer Letter 2").

³Letter to Brent J. Fields, Secretary, SEC, from Adam Nunes, Hudson River Trading; letter to Brent J. Fields, Secretary, SEC, from John L. Thorton, Hal S. Scott, R. Glenn Hubbard, Committee on Capital Markets Regulation, October 13, 2016; letter to Brent J. Fields, Secretary, SEC, from Adam C. Cooper, Citadel, October 13, 2016; letter to Brent J. Fields, Secretary, SEC, from Tyler Gellasch, Healthy Markets Association, October 13, 2016; letter to Brent J. Fields, Secretary, SEC, from Elizabeth S. King, New York Stock Exchange, October 14, 2016; and letter to Brent J. Fields, Secretary, SEC, from Eric Swanson, Bats Global Markets, October 25, 2016.

⁴Letter to Brent J. Fields, Secretary, SEC, from James Ongena, Executive Vice President and General Counsel, CHX, October 28, 2016.

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

The Filing retains this flaw. Its asymmetric speed bump will be implemented in software. Any malfunction or delay in the speed bump software will give privileged participants, its newly created LEAD market makers, an even greater time advantage over other participants without, apparently, any recourse. In the CHX Response, commenting on software-enabled speed bumps, the exchange wrote that the indeterminacies of a software-imposed speed bump already exist and are not materially different from those in CHX's proposed speed bump, and concluded that "delays and queuing are a function of finite network and processing resources, and consequently exist in every market..."⁵

As I wrote earlier:

It's true that finite network and processing resources exist in every market, but there are several important, and gloomy, ways to distinguish the [CHX proposal].

Outside of IEX's 350 microsecond delay, I'm unaware of any other exchange rule with a hard time threshold like this. Unlike CHX'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. 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. 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 to result as a "function of finite network and processing resources" (or even software bugs). 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 [Original] Filing, it may well be that there are one or more ways in which *only* the messages for aggressively priced orders under the [CHX proposal] suffer delays and queuing while messages for non-marketable or resting orders speed along, giving CHX's market makers an even bigger time advantage than 350

⁵CHX Response, page 15.

microseconds. We don't have any details on how - or whether - CHX will even monitor for these conditions, and if it will monitor for them what steps CHX will take to fix a problem or how quickly, and what notice and compensation, if any, it will give participants incorrectly denied an execution.

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 problems through universally applied hardware-based speed bumps or other means, if at all possible. It's true that "delays and queuing ... 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 only benefit an already privileged class of market participants.⁶

CHX tells us that, like IEX's speed bump, its 350 microsecond delay is a *de minimis* delay which doesn't frustrate Reg NMS.⁷ But while IEX's speed bump is implemented in hardware, with high confidence the fiber coil itself can only ever introduce a 350 microsecond delay on every message sent down the coil, CHX's software-based speed bump will be implemented in its own proprietary software, software which could introduce as yet unspecified and unknown queues and delays every day, even many times a day. And if CHX deploys more than one instance of its speed bump within its matching engine complex, 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 350 microsecond speed bump while HPQ suffers from a 375 microsecond speed bump. With news, earnings, or even a tweet from the President, PFE could suffer from a 750 microsecond speed bump while BMY has only a 400 microsecond speed bump. No one knows. No one *can* know. And CHX doesn't tell us at what point it believes delays in its proprietary software speed bump *will* frustrate Reg NMS. Is it 351 microseconds, or 400, or 1,000, or more?

While participants have a remedy under Reg NMS for end-to-end delays over 1,000,000 microseconds (self-help), CHX apparently doesn't plan to give participants any notice of, or remedy for, its speed bump delays, though we can imagine CHX agrees speed bump delays longer than 350 microseconds might frustrate Reg NMS. So far as I can tell CHX doesn't promise to surveil for speed bump delays, either in real-time or at end-of-day (CHX tests its systems continuously in real-time to make sure its quotes still qualify as protected quotes, but that's a different matter). Since every incremental microsecond delay beyond 350 microseconds inherently gets us closer to frustrating Reg NMS, and since every incremental microsecond delay beyond 350 microseconds gives CHX's LEAD market makers a bigger regulatory subsidy than the Filing intends to give them, CHX should address these issues.

CHX claims that "While LEAD is long enough to neutralize microsecond speed advantages exploited by latency arbitrageurs, it is too short to provide any actionable incremental advantage to LEAD MMs in reacting to information not already it [*sic*] their possession."⁸ CHX also says "LEAD is also too short to introduce any incremental risk of manipulative practices, which is supported by the fact that the Commission has recognized that a 350-microsecond delay would not materially increase the likelihood of certain

⁶Leuchtkafer Letter 2, pages 2-3.

⁷Filing, Section 3(b).

⁸Filing, page 66.

manipulative practices such as 'spoofing' or 'marking-the-close' due to the practical difficulties of executing such strategies within such a short time frame."⁹

Presumably then at some point a delay *does* become long enough to provide "actionable incremental advantage to LEAD MMs," and long enough to increase "incremental risk of manipulative practices," and long enough to increase the likelihood of spoofing or marking-the-close. Here again, will CHX at least tell us what that threshold is, and tell us what it will do to ensure its proprietary software doesn't cause those delays without appropriate real-time notice and remedies? If the SEC approves the Filing, will the SEC allow participants who in good faith detect CHX speed bump delays greater than 350 microseconds declare self-help against CHX, so that their own orders can't be abused by CHX's LEAD market makers or subject to spoofing or marking-the-close antics in the CHX market?

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

Others wrote at length about the discriminatory impact of asymmetric delays outlined in the Original Filing.¹⁰ CHX's answer in the Filing is to stand by its speed bump but extend that regulatory subsidy just to a new class of privileged market participants, LEAD market makers. CHX will ask these sun-kissed intermediaries for some very modest performance requirements in return.

It's helpful to pick CHX's proposal apart again to understand what it implies. Since the speed bump is intended to let its LEAD market makers adjust their quotes in response to price changes on the CME, CHX's speed bump will only benefit market participants who become LEAD market makers and subscribe to CME's data feeds. And of course they must have the capital and sophistication to do both. Retail investors like Mrs. Betty Johanssen of Red Lake, Minnesota, will never benefit; institutions will never benefit. The Filing's discriminatory impact, then, ordinarily a vice, CHX tries to rehabilitate by telling its LEAD market makers they have to quote and trade to some *de minimis* standards. But let's be clear about the subsidy CHX will use its regulatory power to bestow. CHX will give its LEAD market makers an exclusive look at the book, ahead of all other participants, just as, back in the bad old days, stock exchange specialists had an exclusive look at the book. CHX will resurrect one of the most controversial aspects of the exchange specialist model without requiring much at all 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 the exchange's order book. The economic value of that view came from all the information specialists harvested from the book before that information disseminated into the market. The book was the focal point for price discovery and specialists saw it first. 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. CHX's extended discussions in the Filing, as in the Original Filing, of how and why it intends to privilege certain market participants and discriminate against others, tell us that CHX recognizes that, at minimum, certain ETF price discovery doesn't happen in its own book anymore but rather mainly at CME. CME seems to be the focal point for price discovery in CHX's market, and CHX apparently believes a 350 microsecond exclusive view of CME's book is enough in today's automated markets to advantage LEAD market makers over every other kind of market participant, no matter how sophisticated, so that's what CHX plans to ladle out.¹¹

⁹Filing, page 66.

¹⁰See note 3.

¹¹LEAD market makers get that 350 microsecond head-start with CHX's own book too, obviously.

Having suffered in today's markets, CHX seems, in large part, to revive and subsidize the exchange specialist model under a different name.¹² Price discovery happens in a different book, but the architecture of the CHX subsidy is the same: an exclusive view at price discovery long enough to squeeze value from it.

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. CHX must demand affirmative *and* negative obligations from its LEAD market makers. CHX must obligate them to maintain fair and orderly markets with more than the perfunctory performance standards it proposes, must prohibit them from destabilizing trades, and must make them yield to agency orders at a price. They should have specific responsibilities around the open, close, and in volatile markets. CHX should also obligate its LEAD market makers to build appropriate information barriers to ring-fence their LEAD market making functions from all other functions at their firms, not just to segregate any firm customer order flow or options trading but to prevent the firm from using its advantages on CHX in any other proprietary trading. If LEAD market makers can react on CHX to material information from any source before anyone else can react to it on CHX, then within the confines of CHX's market that information should be considered material non-public information, and should only be used for LEAD market maker functions at CHX in their registered names. For example, LEAD market maker position information should be segregated from other parts of the firm because those positions were taken on while the LEAD market maker had, in effect, material non-public information about those names. That edge is the whole point of the Filing, and firms should be prohibited from profiting from that edge in any other way on any other market.¹³

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 protect everyone's hidden orders from getting picked off at stale prices, but CHX's speed bump will only privilege CHX's nouveau specialists. That's all because, at least for now, CHX says these downtrodden firms have lost the speed arms race against other firms and CHX 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 - CHX justifies its 350 microseconds either "Because: IEX" or by a relative and constantly changing issue, a speed arms race. So if and when LEAD market makers get back on their feet and speed up, or if and when other firms slow down or even exit, does CHX have any plans to adjust the duration of its speed bump? If not, why not? If IEX changes its speed bump, will CHX change its own? If not, why not?

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

The Original Filing contemplated speed bumps on marketable orders and implemented on a security-by-security basis, at CHX's discretion. That would have enabled intra-exchange latency arbitrage if CHX speed bumped some instruments but didn't speed bump correlated instruments. CHX then offered to pilot a speed bump on every instrument traded on the exchange. Now CHX plans to speed bump every

¹²Depending on how many LEAD market makers register CHX might end up with a *de facto* competing specialist model, but their edge over everyone else - an exclusive (if short-lived) view of price discovery in the book - is the same.

¹³"Hedging" on other markets is the most likely way firms will want to use LEAD market maker information, a fudge that can enable firms to extract even more value from their speed bump on CHX. If they accumulate a position on CHX using the advantages of their (de facto) material non-public information on CHX, they should only be able to hedge the position on CHX. Otherwise, firms can use their privileges on CHX to accumulate a position and then lay it off or hedge it somewhere else, aggravating marketplace asymmetries and extracting speed bump rents throughout the markets. LEAD market makers should be prohibited from it. Said another way, LEAD market maker positions taken on CHX are positions irremediably sweetened by a valuable regulatory subsidy. CHX's LEAD market makers should not be allowed to shake additional rents from their subsidy through regulatory arbitrage, that is, by trading or hedging CHX positions on markets that don't have CHX's speed bump rules. LEAD market maker positions taken on CHX are the fruit of a subsidized tree and should stay at CHX.

instrument but exempt nonmarketable orders originating from its LEAD market makers in their registered securities.

The details have changed from the Original Filing, but because CHX doesn't impose negative obligations on its LEAD market makers and doesn't impose information barriers to segregate LEAD market making from all other proprietary trading, CHX's plans still enable intra-exchange latency arbitrage. Suppose a LEAD market maker is registered in the SPY ETF. When it sees new pricing emerge at CME, it can use its speed advantage to cancel its own SPY quotes and then separately try to pick off stale SPY quotes. Under the Filing the LEAD market maker's aggressive orders will be speed bumped, but so what? The firm is no worse situated than any other firm, but because of the speed bump subsidy its risk of adverse selection has been sharply reduced in SPY. CHX might even count the LEAD market maker's aggressive trades in SPY toward the market maker's performance requirements.¹⁴ Or the firm can presumably use any of its other proprietary trading accounts to pick off stale quotes in SPY or in any correlated name, with match trade prevention in place to help make sure the firm doesn't trade with itself.

As I have commented before, market makers already get lots of regulatory subsidies. There's only one policy reason to justify these privileges. Regulatory subsidies like rule exemptions, favorable capital requirements over other market participants, favorable pricing, exclusive order types, and more, compensate them for adverse selection. If market makers never suffered from adverse selection they wouldn't be entitled to any of them. Instead, to encourage market makers to maintain two-sided quotes in all market conditions, regulators hand out subsidies. The theory is that whatever market makers lose to adverse selection is offset by all the regulatory handouts they fill their pockets with. The Filing's novelty is that it compensates market makers for adverse selection by helping them avoid it altogether, which flipflops any justification for their special status and privileges. As a public policy matter the government can't subsidize middlemen to provide orderly markets in difficult conditions and then approve a fast lane to run from them. CHX will not only open a fast lane for its LEAD market makers to avoid adverse selection, it might even count their aggressive trading - which may well be the same latency arbitrage trades CHX laments - toward market maker performance requirements.

Other ways to solve the problem

As I noted on the Original Filing, there are likely other ways to confront latency arbitrage CHX could explore: CHX could try moving its servers closer to or alongside CME's servers, or move them to New Jersey; CHX could speed bump traffic coming from the CME's data centers; CHX could implement a random, varying speed bump for everyone, as former SEC Chief Economist Larry Harris has proposed. Though no doubt inconvenient, CHX could also simply prohibit latency arbitrage by rule and enforce the rule by examination.¹⁵

Instead CHX points to IEX's far more nuanced and equitable proposal than its own to justify its Filing,¹⁶ and says we should answer participant asymmetries in the marketplace with more participant asymmetries, this time with an exchange's regulatory power and subsidy behind them. (If we were to spread that civic logic

¹⁴And if a LEAD market maker successfully picks off a stale quote in SPY, who is it being picked off? It likely won't be another professional. It likely will be a retail or institutional order. So the LEAD market maker can use its speed bump privileges to avoid adverse selection, and then if it successfully picks off the public in a latency arbitrage trade CHX might well credit the market maker against its performance requirements.

¹⁵If in its view CHX can define latency arbitrage well enough to justify a major rule filing like this, it can define latency arbitrage well enough to prohibit it.

¹⁶Unless I missed it all, CHX doesn't show IEX's rigor justifying its specific speed bump threshold, or IEX's technical care implementing it, or IEX's diligence monitoring it.

around we could move on to proposals like how our response to insider trading could be more insider trading¹⁷ and our response to spoofing could be more spoofing.¹⁸ Think of the taxpayer savings.)

Triggered by scandal and with the SEC's blessings, from the 1990s to today stock markets transformed themselves from dealer-driven to order-driven platforms. The whole point was to eliminate time, place, information, and regulatory asymmetries that gave privileged intermediaries fat advantages over other market participants and the public. As proposed, the Filing is a fearsome step back, a regulatory subsidy intermediaries can and will use how they like, with very little asked of them in return. If approved, it will establish the toxic precedent that exchanges can respond to real or imagined marketplace asymmetries with more asymmetry, and exchanges will reinstate the same formal time, place, information, and regulatory preferences to their middlemen firms the exchanges stripped away when they promised the SEC they would open their markets to competition and become more fair. Of course along the way the exchanges will pick and choose who benefits and try to skip the limited protections we once had for the public, step-by-step undoing decades of market reforms, or worse. If the SEC will allow the reintroduction of explicit time and information preferences like this for market intermediaries, regulatory subsidies it was once the SEC's ambition to reduce or eliminate, we should have a much broader discussion about the topic than we can in the comment period for a small exchange's rule filing. In the meantime, please say no.

Sincerely,

R. T. Leuchtkafer

¹⁷"Insider trading enriches and informs us, and could prevent scandals. Legalize it," Dylan Matthews, Washington Post Wonkblog, July 26, 2013.

¹⁸"Spoofers Keep Markets Honest," John D. Arnold, Bloomberg View, January 23, 2015.