



May 26, 2020

Via Electronic Mail (rule-comments@sec.gov)

Ms. Vanessa Countryman, Secretary
U.S. Securities and Exchange Commission
100 F Street NE., Washington, DC 20549

Re: Proposed Rule on Market Data Infrastructure¹ File No. S7-03-20 (Release #: 34-88216; RIN 3235-AM61)

Dear Ms. Countryman:

On behalf of Data Boiler Technologies, I am pleased to provide the U.S. Securities and Exchange Commission (SEC) with our comments on this release concerning market data infrastructure. First, we applaud the Commission for the 297 thought-provoking questions. It is humbling to marvel at how the market data and market access topic involves many intertwined Rules – 17 CFR §242.600 National Market System (NMS), 603 Quote Display, 605 a.k.a. Reg. Best Interest (BI), 610 Access Fee; 611 Order Protection, 613 Consolidated Audit Trail (CAT), and the new proposed Rule 614 Competing Consolidators (CCs). The SEC's Trading and Markets division, together with other supporting teams, have definitely done a tremendous job to holistically showcase why our market data infrastructure needed a change right now. Yet, we have reservations and concerns about the SEC's proposed Consolidated Market Data (CMD), Decentralized Consolidation Model (DCM), and related economic effects, including but not limited to, possible implications to the National Best Bid and Offer (NBBO) and broker-dealers (BDs). As an entrepreneur with a suite of patented inventions in market data and trade surveillance, I would like to point out some flaws in DCM, CMD and related matters. The proposal needs **appropriate fixes before** the industry can **practically implement** the necessary changes to transition to a new equilibrium.

① **Our Understanding and Rebukes**

We would describe “new equilibrium” as the market where “fairness, reasonableness and non-discriminatory” principles are testified rather than merely using a disclosure or via self-claim promotion. We envisage this “new equilibrium” would achieve what Chairman Clayton have said, “**Ensure that core data evolves along with the broader market ecosystem**”² from the perspective of minimizing gaps, rather than spark another “drag-race” that only benefit telecom companies. The gaps we refer to are not only the gap between the existing Securities Information Processor (SIP) or the proposed CMD and the Exchanges' Proprietary Products (PP), but the inequalities between High Frequency Trading firms (HFTs) and average investors in NMS where former Chairman Mary Jo White has stated the need to “**deemphasize speed as a key to trading success**”.³ We despise monopoly⁴ and favor competition (we do like to be one of the CC contenders if given the opportunity). Yet, “war to end all wars”⁵ has historically proven to fail and many adverse consequences⁶. We believe the competitive race should be about who has the best trade strategies to support economic growths, rather than the rich having privileges on their ever faster transmittal speed using microwave⁷, laser⁸, quantum⁹ technologies, etc.

¹ <https://www.sec.gov/rules/proposed/2020/34-88216.pdf>

² <https://www.sec.gov/news/speech/clayton-redfearn-equity-market-structure-2019>

³ <https://www.sec.gov/news/speech/2014-spch060514mjw>

⁴ <https://thehill.com/opinion/finance/398273-the-nyse-holds-a-troubling-monopoly-on-trade-data>

⁵ https://en.wikipedia.org/wiki/The_war_to_end_war

⁶ <https://www.huffpost.com/entry/economic-consequences-of-b-1294430>

⁷ https://www.six-group.com/exchanges/participants/participation/connectivity/microwave_network_en.html

⁸ <https://www.quora.com/Why-is-laser-communication-faster-than-microwave-or-radio-communication>

⁹ <https://windowsontheory.files.wordpress.com/2017/06/cnsa-suite-and-quantum-computing-faq.pdf>;

<https://altaonline.com/quantum-computing-timothy-ferris/>



Table 1 below summarized key areas where we disagree or have concerns about the SEC’s proposal and its assumptions:

#	SEC’s preliminarily believe	Our rationale for the rebukes
1	<i>“Same manner same method” will achieve same result as “market data available securely in synchronized time”</i>	Collocation¹⁰ ≠ Latency Equalization (LEQ)¹¹ ≠ Market Data Available SECURELY in Synchronized Time¹² . It is a shame that even online gaming industry uses LEQ, while electronified markets ¹³ adopt a lower standard. Without putting the right parameters to bound performance, it is merely a “standard price list”. “Same format” hurts average investors and gives HFTs a permanent advantage (See Figure 3).
2	<i>CC competition using microwave, laser will improve efficiencies and latency comparable to PP ... substantially reduce the latency differential</i>	This exacerbates gap between the “have” and “have not”. The SEC’s proposal is based on 10G connectivity while NYSE launched 100G collocation service since April 2020. This 10 times difference would soon become 40, 80, or even 160 times soon. As long as NMS remains a “drag race”, the rich would access connectivity that will not be reasonably affordable to average investors . The industry does not need another ultra-fast bullet to harm one another. Ratio between non-CCs and CCs’ connectivity must not exceed a certain threshold. Also, real-time market data is valuable and its security must be protected by using time-lock ¹⁴ to ensure no premature decryption.
3	<i>... previously concerned about the risk that fees for core data would increase ... in contrast, under DCM, SROs would continue to develop jointly the fees ... subject to Commission oversight under Rule 608 ... benefits of less expensive alternatives to PP</i>	CC is indeed an intermediary between suppliers and users adding a layer of cost to the overall system if it does not perform any value-added function. Taking over some of the existing functionalities of Exchanges’ PP do not count as “value-added”. Whatever positive effect from breaking up Exchanges’ monopoly is going to be short-term, while long-term sustainability is doubtful because Exchanges may exploit any disparity between CMD and PP, and/or per #2, the rich may be allowed to access connectivity that not reasonably affordable to average investors. As mentioned in our Dec 2019 comment ¹⁵ , guidance ¹⁶ reminds SROs that SEC is vigilant. Yet, no further exacerbating of market data price differences has not been achieved ¹⁷ and it does not ensure a fair and efficient access.
4	<i>Competitive pressure will cause exchanges to lower PP fees in effort to stay competitive with the CMD</i>	“Exchanges may optimally restrict access to price information for rent seeking behaviors.” ¹⁸ PP fees will go up rather than go down because demand is inelastic . Benefits from less expensive alternatives to PP will be offset if Exchanges exploit disparity (level 2 DOB, OTC, non-equity data, etc.) to recover loss profits to CMD.

¹⁰ For co-location at same data center, [speed performance can vary significantly](#) depends on [connectivity](#), kilowatts and equipment cabinet, as well as other configuration and firmware [parameters](#). Some connectivity options offered by Exchanges as of today include: [1G/ 10G/ 40G/ 100G](#). However, [400G](#) is already being offered commercially in other industry as of last year, [800G](#) is already achieved in late 2019 to early 2020, and the Ethernet Alliance projects [1.6Tbit](#) would become standard possibly between year 2023 and 2025.

¹¹ “Under Articles 48(8) and (9) of Directive 2014/65/EU in MiFID II, trading venues are required to provide “transparent, fair and non-discriminatory” collocation services that “do not create incentives for disorderly trading conditions or market abuse.”

<https://www.interxion.com/blogs/2018/082/latency-equalisation-the-need-for-fair-and-non-discriminatory-collocation-services>;

“Latency equalization is a very different perspective to ‘low latency’ in the fact that latency may need to be increased to ensure fairness of trade.” <https://www.datacenterdynamics.com/en/opinions/mifid-ii-changing-the-way-traders-do-colocation/> “Although LEQ could be performed by the client or the server, end-system techniques for estimating network conditions are often inaccurate” <https://www.cs.yale.edu/homes/yu-minlan/writeup/presto08.pdf> There can be: programmable routing service approach, [adaptive equalizers](#), [advance linear equalization](#), etc. which different techniques have different pros and cons impacting performance.

¹² <https://www.linkedin.com/pulse/market-data-available-securely-synchronized-time-kelvin-to/>

¹³ <https://www.amazon.com/Market-Mover-Lessons-Decade-Change/dp/1538745135>

¹⁴ <https://people.csail.mit.edu/rivest/pubs/RSW96.pdf>

¹⁵ <https://www.sec.gov/comments/4-729/4729-6510588-200169.pdf>

¹⁶ <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees>

¹⁷ <https://www.sec.gov/comments/4-729/4729-7055621-215387.pdf>

¹⁸ <https://pdfs.semanticscholar.org/b61b/597e0c4268eaec75fb744b4e1802c3beb8aa.pdf>



#	SEC's preliminarily believe	Our rationale for the rebukes
5	<i>Multiple NBBOs would not vary from today's self-aggregating practices or is non-novel/ insurmountable</i>	Using an analogy of a foreign currency pegged with the US dollar versus a basket of other assets, different NBBOs calculated by CCs in silos erode the de facto status ¹⁹ of SIP's NBBO that broker-dealers rely on globally, push the US market to reduce to the level of brokenness like the Europe or other markets, and impact liquidity.
6	<i>Expanded content allows more to take advantage of trading opportunities and lowering transaction costs</i>	Short-term cost drop will not be sustainable if trading volume stays flat. Price may be a dismissible factor among others to affect BDs choice to switch from solely using SIP to CMD. Despite 3 sets of CC fees is applaudable, but the underlying issue is like Animal Farm ²⁰ – some get 32 mils, why others' data worth less?!
7	<i>Potential new entrants into the broker-dealer, market making, and other latency sensitive trading businesses</i>	Lowering short-term CMD cost does not mean PP price will go down. At mentioned in #4, PP fees would go up affecting everybody in the latency sensitive trading businesses ²¹ . Fight over Exchange's new antennas might cost gazillion-dollar. ²² Two HFTs already dominated much of the market ²³ (trades interact with retail order flows in particular). These indeed reflect a matured market with excess capacity ²⁴ . More new entrants would not be economically viable , besides it shouldn't be encouraged because it is contrary to the "deemphasize speed as a key to trading success" goal.
8	<i>Expansion of opportunities for aggregators ... If a new technology would result in better provision of data, a CC likely would adopt that technology to expand its client base ... increasing the amount of innovation in the consolidation and dissemination of CMD</i>	Bloomberg and Refinitiv already dominated the consolidated market data field. ²⁵ If any existing market data aggregators ²⁶ can spread their fixed cost across a larger base of consumers (in benefiting the industry to strike for a "fairer and non-discriminatory" outcomes), it would have succeeded a long time ago. Maximize life of aged technologies beyond 10 years' amortization period is in existing aggregators' best self-interest. Breakthroughs require fresh innovations from someone new. Existing players may buy-in to DCM because they have almost no incremental cost to become CCs. Their revenue upside depends on how hard the SEC and industry beaten up the Exchanges on their behalf. Market reform should allocate most rewards and provide a reasonable return for those who are able to innovate and contribute.
9	<i>Enhance the quality of data vendors' services and facilitate best execution</i>	If DCM functions well, BDs should rely less on vendors' services for best execution because non-positive NBBO spread caused by locked and crossed markets ²⁷ should already been eliminated. Seems contradictory to 'new equilibrium' and bias to SAs.
10	<i>It is unlikely exchanges will be forced to leave the market. Even if an exchange were to exit, ... does not believe this would significantly impact competition ... for trading</i>	IEX could possibly take advantage of this to become CCs and revert itself back to dark pool status. Policy makers can mandate a "split" ²⁸ between Exchanges' trading and data businesses, but should not skew/ bias its policy towards non-lit venues. Migrate more trade flow to lit venues with better transparency and grow the pie benefit average investors. The opposite is detrimental to the Buy-side if IEX ever leave the exchange space . Besides, SEC should stay vigilant on risk of Internalizers ²⁹ and ongoing trends if Exchanges scooping up dark pools may be on the rise ³⁰ .

¹⁹ <https://mhderivatives.com/replacing-libor/>

²⁰ <https://www.linkedin.com/pulse/animal-farm-market-data-negotiate-more-equal-kelvin-to/>

²¹ <https://www.ft.com/content/d81f96ea-d43c-11e7-a303-9060cb1e5f44>

²² <https://www.bloomberg.com/news/features/2019-03-08/the-gazillion-dollar-standoff-over-two-high-frequency-trading-towers>

²³ <https://www.ft.com/content/e1cb396e-29a7-11e7-bc4b-5528796fe35c>

²⁴ <https://www.afr.com/markets/the-highfrequency-trading-bonanza-is-over-heres-why-20180102-h0cm09>

²⁵ <https://www.greenwich.com/market-structure-technology/consolidated-market-data-feeds-thrive-despite-rising-data-fees>

²⁶ <https://www.nasdaqtrader.com/Trader.aspx?id=MarketDataVendorsList&StartAlphabet=A&EndAlphabet=ZZZ>

²⁷ <http://faculty.bus.olemiss.edu/rvanness/Speakers/2004-2005/LockedCrossed-ver11.pdf>

²⁸ <https://www.linkedin.com/pulse/split-told-how-govern-kelvin-to/>

²⁹ blogs.cfainstitute.org/marketintegrity/2018/07/13/mifid-ii-and-systematic-internalisers-if-only-someone-knew-this-would-happen/



#	SEC's preliminarily believe	Our rationale for the rebukes
11	<i>improve the competitive positions of some off-exchange trading venues</i>	This is contradictory and bias toward SAs . Alternative Trading Systems (ATs) and Smart Order Routers (SORs) might be better off if equity market remains fragmented ³¹ – the weaker the CC, the more opportunities to come up with new market designs/ order types that extends the current market convulsion.
12	<i>Bolster the resilience of the market data infrastructure</i>	One SIP rival (or one set of redundant systems at remote site within same entity) would be sufficient from continuity planning/ disaster recovery perspective to address the so-called “single point of failure” concern. The proposed twelve CCs are significant economic resources wastage , like Exchanges’ medallions not being used.
13	<i>CCs would likely establish their own standards for verifying information for consistency</i>	Like the CAT project, time-granularity ³² has to be set by the SEC/ FINRA, or else the industry lacks incentive to push for the most precise standard . Besides, NBBO should NOT be interfered or influenced by CCs or market data aggregators ²⁶ with ties to foreign government officials ³³ , Form CC disclosure + restrictions are needed.
14	<i>Exchanges continuing to offer connectivity at different latencies would further promote product differentiation by CCs ... market participants would be willing to make the necessary technology and personnel investments to take advantage of the latency reductions provided by the DCM.</i>	Exchanges continuing to offer connectivity at different latencies exacerbate the “ drag race ” as mentioned in #2, further promote product differentiation by CCs might just be wishful thinking because CCs rely on economy of scale, not economy of scope. Besides, the more CMD contents equate to PP, the harder it is technically to catch up on latency differential. Moore’s law ³⁴ said processing speed double every 18-24 months. Today’s gap is already 10 times different (i.e. SEC’s proposal is based off 10G while NYSE already offer 100G). Upgrade to 400G and 800G connectivity could happen next month or within this year. In other words, not sufficient time to reach critical mass for a large enough base of consumers to spread the ever higher fixed cost even if the proposal was suggesting three instead of twelve CCs to divide the market. Frankly, the latest and most advanced tech development costs usually amortize in 10 years, having investments burnt out every 2 years isn’t worth it.
15	<i>proposal would permit the market data infrastructure to more readily adapt to changes in technology to better fit the needs of market participants ...</i>	Although it sounded similar to “core data evolves along with the broader market ecosystem” ² , but “more readily adapt” has a trailing impression, whereas we would interpret “evolves along” as parallel, in-synch , and ensure ratio between non-CCs and CCs’ connectivity must not exceed a certain threshold . Also, there are questions about “what needs” and “which market participants” would be better off? As pointed out in #14, no one can defy the reality that the need of content richness would come at the expense of latency, and vice versa. It boils down to tradeoffs , and we see the latency issue is compromised. Barriers to entry for latency sensitive businesses would be exacerbated as pointed out in #7. In turn, existing large HFTs, the 2 large market data aggregators, ATs and other SAs would benefit in the short-term , while everybody lose in the long-term because the overall pie won’t grow and unfairness continue because no settlement on the ‘who owns the data’ question and further market fragmentation.

³⁰ www.prnewswire.com/news-releases/cboe-global-markets-agrees-to-acquire-leading-canadian-ats-matchnow-301061650.html

³¹ <https://www.sec.gov/marketstructure/research/fragmentation-lit-review-100713.pdf>

³² <https://www.linkedin.com/pulse/clock-synch-challenge-new-solution-kelvin-to/>

³³ whitehouse.gov/presidential-actions/executive-order-securing-information-communications-technology-services-supply-chain/

³⁴ <https://www.britannica.com/technology/Moores-law>



② **Enlist the Who's Who**

Updating 17 CFR §242.603(a) is essential to properly “**protect**” these valuable real-time data,³⁵ and promote the **fair** and **non-discriminatory** principles. This is also a way to enable the industry to have **reasonable** mean to negotiate with the powerful suppliers – i.e. the SROs, the large Exchange Groups in particular. Merely approving the new SIP operating committee governance structure³⁶ is insufficient to foster the two sides come to reasonable agreement. In our opinion, there has to be a **reasonable “price” to strike a commercial deal before the SROs may turnover their lucrative stake to give CCs a viable chance to survive.**

Table 2 below summarized our thoughts towards emerging dynamics among different existing constituents:

Players (exclude new entrant CCs)	Economy of		Possible moves, speculative questions, and foreseen challenges
	Scale	Scope	
SRO: large Exchange Groups	☑	☑	NYSE and NASDAQ are likely to fight back ³⁷ with possible litigations and/or modify fees/ rebates/ market designs which Rule 19(b)-4 would not hold them back. CBOE may be more opened as long as it means possible taking more order flows from rival Exchanges/ ATSS.
SRO: New Lit Venues	◇	☑	MEMX sponsors (now 5 more ³⁸) may renegotiate terms with large Exchange Groups depending on how the final version of the renewed Market Data Infrastructure. Best option for MIAX’s partners is to join force with other non-MEMX global banks to pull order flow away from large Exchange Groups. Many uncertainties in this Warring States Period ³⁹ , but based on the various industry comments regarding New NMS Plan ⁴⁰ , I foresee a majority would favor the DCM or anything quick to shake up market. Question is: Who owns the data? ²⁰
SAs: Internalizers	☑	◇	True leveling of the playing field is detrimental to speed advantage that HFT Internalizers currently hold. Yet, market access should not be limited to those who can afford ultra-expensive technologies. Hence, SEC mandating the use of time-lock encryption is the bare minimum in attempts to even this match. Regarding other Internalizers, they may join new lit venues to tip the scale in disrupting the existing large Exchange Groups.
SA: ATSS, SORs and other Vendors	◇	☑	ATSS and SORs might be better off if equity market remains fragmented – the weaker the CC, the more opportunities to come up with new market designs/ order types that extends the current market convulsion. Large market data redistributors may want to become CCs because only little to no incremental costs to them. Yet, they have no incentive to advance their technologies for the best fairness and non-discriminatory outcomes.

Existing constituents do not necessary want to “even-out” this race of latency and contents differentials. According to Eric Budish, Robin S. Lee, and John J. Shim’s empirical research – Will the Market fix the Market?⁴¹, it has proven that: “... new market design would win share ... However, imitation would result in an equilibrium that resembles the **status quo**...”

³⁵ https://www.databoiler.com/index_htm_files/DataBoilerInMotion.pdf

³⁶ <https://www.sec.gov/news/press-release/2020-103>

³⁷ <https://www.wsj.com/articles/stocks-exchanges-accuse-government-of-ethics-lapse-in-market-data-fight11561423837>

³⁸ <https://www.marketwatch.com/press-release/members-exchange-closes-strategic-financing-round-with-five-new-investors-including-blackrock-2020-05-12-151593126>; <https://www.ft.com/content/6aad5b60-5378-476f-9636-4d06017fff9e>

³⁹ <https://www.linkedin.com/pulse/warring-states-period-finding-new-equilibrium-kelvin-to/>

⁴⁰ <https://www.sec.gov/comments/4-757/4-757.htm>

⁴¹ <http://www.people.fas.harvard.edu/~robinlee/papers/ExchangeComp.pdf>



The SEC’s estimated costs for CC is far too low because the consolidated **data volume** would likely be **comparable to** (though a bit smaller than) the CAT which targeted to process between 30-120 billion trade events daily or more than 29 petabytes of raw uncompressed data in 6 years. Also, building a SIP rival cost substantially more than ATS that handles only a subset of the total market volume. **Posting quotes but not matching trades is in essence limiting business scope of CCs.** Given there is also compliance burden, such as the SCI requirements, therefore we think the proposed twelve CCs would definitely cause too much **competition hampering survival of CCs that rely on economy of scale to post quotes.**

Taking an analogy from the U.S. Constitution about “balance of power” among government branches (i.e. the executive, legislative, and judicial), plus the implicit 4th power – the media, we come up with [Figure 1](#) below for a proposed 3-pillars model to align the interests of regulators, SROs, CCs, and the industry at large.

Securities and Exchange Commission

Assurance

3 – SEC/ FINRA

Admin CC licenses, perform annual assessment, and help remove roadblocks. If NMS reform is done right and CC deliver on its promised, then success would look like:

- Secure synch availability of market data at lower cost
- Deemphasize speed as a key to trading success
- Industry will relies less on dark pools (ATSs), SORs, etc.
- Grow market participation from average investors

Execute the plan

1 – Competing Consolidators (CCs)

- Business continuity/ disaster recovery for SIP
- Expand SIP functionalities/ takeover some prop feed services to offer at more affordable price
- Innovate, promote fairness + enable average investors
- Serve as conduit to facilitate reasonable negotiation btw industry and the SROs (solve question on who owns data)
- Analytical support for CAT

Set Boundaries

2 – SROs, SIP advisory committees + Reps from industry organizations that are neither SA nor CC

- Recommend to the SEC on data coverage, time synch granularity, and other performance boundaries that considers different tradeoffs to optimize latency and content richness
- SROs supply data covered in scope to CCs and SAs
- Direct sell non-covered data
- Remedies in case CCs fail

4 – Self-Aggregators (SAs) Grow business at the expense of market ineffectiveness and inefficiency

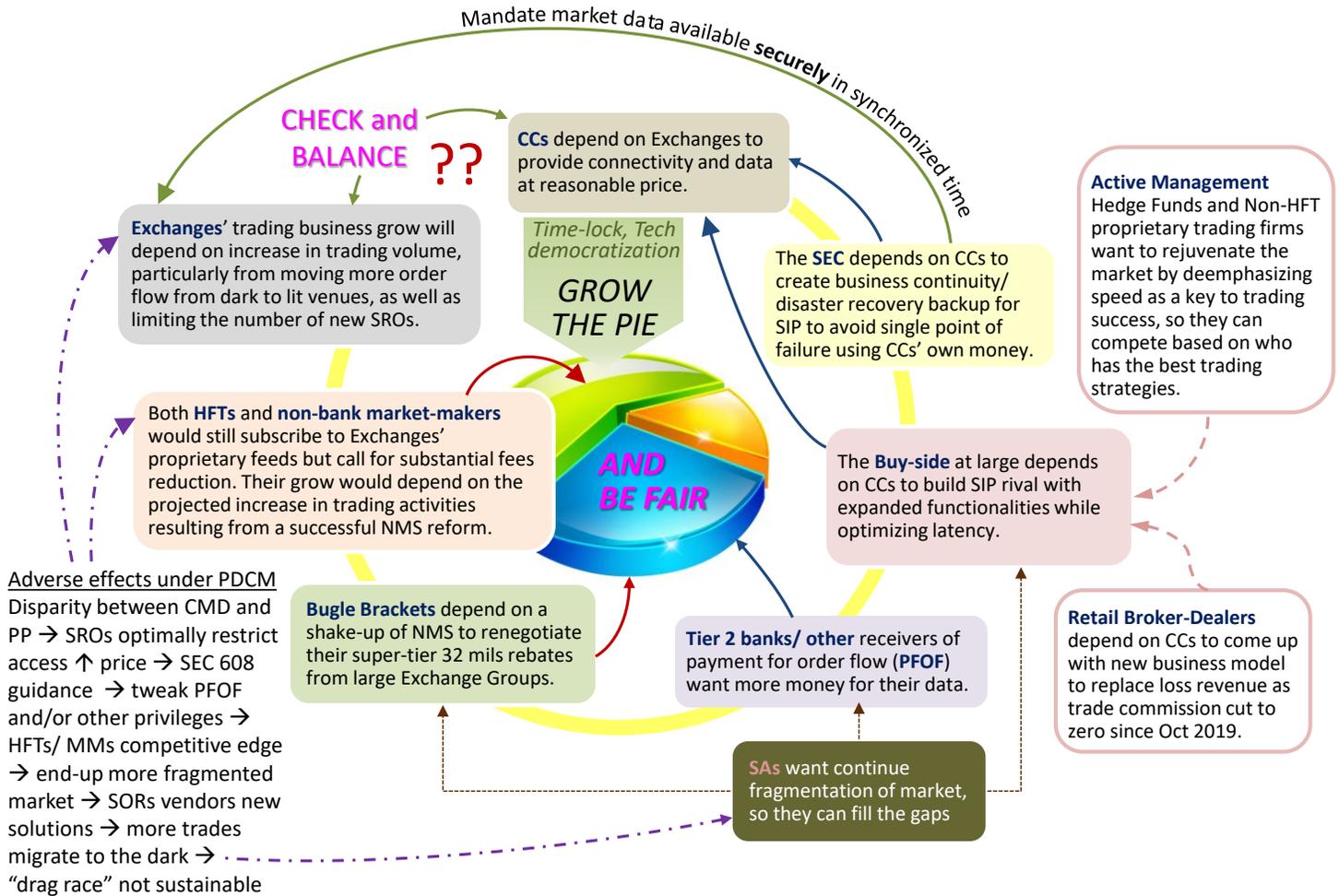
- the rich may be allowed to access connectivity that not reasonably affordable to average investors
- introduce benchmark reference price arbitrage due to multi-NBBOs as well as CMD and PP disparity
- new market designs/ order types to extend the payment for order flow fight and market convolution

As illustrated above, we envisage **CCs** at the center (1 – **executive branch**) for its prominent role in shaking up the market data infrastructure. CCs would carry out market data improvement vision and mission that shaped collectively by the **SROs, SIP advisory committees, and other representatives from the industry** (2 – **legislative branch**). Then, to assess and validate if NMS reform would yield the expected net positive outcomes and help remove any roadblocks when otherwise, we look up to the **SEC and FINRA** to play this assurance role (3 – **judicial branch**). We view **SAs**, including ATSs, Internalizers, and SORs, as the 4th power likes the **media** in the outer circle. **SAs’** business would grow at the expense of market ineffectiveness and inefficiency. Hence, there is an **inverse relationship between SAs’ performance and what success would look like in transitioning to a new equilibrium.**



③ **Envisage to Develop Strategy**

In order to make the 3-pillars model works, there has to be a **shared vision**, so that various constituents would **create proper interdependency** on each other to “**grow the pie**”⁴². First, we listed out who and where different groups of stakeholders are in the “circle of influence” and who should be out of the circle because of potential conflict with the stated goals of the 3-pillars. Then, we consider what these different groups want out of this market reform, what are their strategic options, and what they will depend on in order to achieve their respective desires. **Figure 2** below showcased the interdependencies for various constituents and highlighted various market dynamics:



The **yellow** ring represents the “circle of influence”, two things may be notice: (1) it is broken – because the SEC’s proposal gives nothing for anyone to reasonably negotiate with large Exchange Groups; (2) SAs are kept outside of the circle. We are grateful for SAs filling the gaps to serve a very fragmented market in the past. SAs will still have a role going forward, they will be monitoring from the outside and take advantage whenever market reform is unsuccessful to reach it goals. Indeed, the level of market participants’ reliance on SAs is indeed the best metric to keep everyone honest.

The **blue** arrows → may perceive as the positive driving force. The **red** arrows → are not necessary resistant forces, but what these groups want may be very different or contrast with the blue arrows. Given that and the question marks (??) on large Exchange Groups and MEMX willingness to cooperate with CCs, a lack of “**check and balance**” is what causes this

⁴² <https://www.cnn.com/2020/05/14/ray-dalio-on-coronavirus-effect-on-economy-society.html>

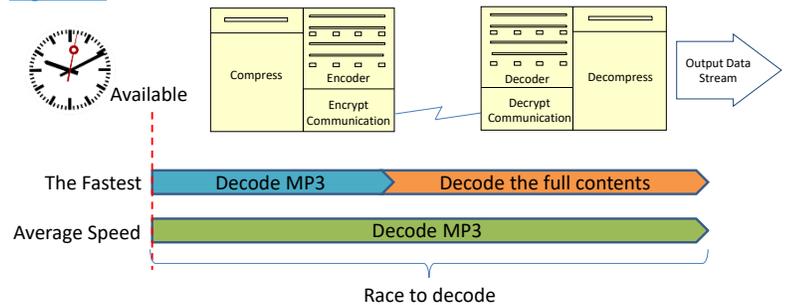


circle not “unify” or broken. Without a unified circle, we are concerned if Exchanges might tweak payment for order flow (PFOF) and/or other privileges, end-up causing market to be more fragmented, more trades migrate to the dark or market shrink that is opposite to “grow the pie” objective. Hence, we need the **green** arrows → to mandate market data available **securely** in synchronized time to bring fore essential “checks and balances”.

Again, “same manner and methods” if without putting the right parameters to bound performance may merely be a “standard price list” for market data and connectivity offers by a particular Exchange. Valuable market data in real-time needs proper **security protection**, different Exchanges may use different time-locks¹⁴ to make market data available **securely** in synchronized time.¹² Mandating the secure synchronization of “start time” would prevent anyone from having an unfair advantage at the **starting-line**. Also, **TLC would eliminate latency difference due to ‘extra hop’ disadvantage for non-SAs**. That being said, HFTs using high performance computers to decrypt data may still have an edge assuming same full contents of core data and same data compression method.

Using traditional techniques that exploit statistical redundancy, Huffman coding⁴³, or probability method to represent and compress market data yield only 5% to 20% reduction in size of original stream. Our patented techniques can do up to 60% reduction in size of original stream by **altering data format** and **compression methods**. Together with some tradeoffs for what constitute as essential contents of core data, a **fair race** among different players is possible under certain conditions.

Figure 3



The **conditions** we refer to include: the fastest/ highest capacity **connectivity** that SROs offer to non-CCs should NOT be faster/ have higher capacity than 2 to 3 times the slowest connectivity used by any CC. For example, if the slowest CC connectivity is at 10G, everyone else cannot have connectivity with SRO at higher than 25G. This is to **avoid a scenario where latency gap is too large or overly frequent upgrades** by SROs cause the connectivity cost, even though the fastest speed is one of the available options in the price list, to be **not affordable** by CCs and average BDs. As mentioned in #2 of **Table 1**, the SEC’s proposal is based on 10G connectivity while NYSE launched 100G colocation service since April 2020. This 10 times difference would soon become 40, 80, or even 160 times soon.¹⁰ Therefore, in order to ensure “core data **evolves along** with the broader market ecosystem”², policy makers should **require SROs to comply with**:

A ratio between the fastest non-CCs and the slowest CCs’ connectivity NOT to exceed a 2.5 times threshold

If a SRO intends to upgrade its fastest connectivity beyond (or already exceeded) the 2.5 times threshold, the SRO should cover the prices difference to upgrade CCs’ connectivity for FREE. Besides, the SRO should offer older model equipment for FREE or at discounted price to subsidize/ cover the cost of CCs and BDs for necessary replacements and/or upgrades. We want to emphasize that this is NOT to penalize anyone in pursuit of ever faster speed to make the market more efficient. We are not trying to “split”²⁸ Exchanges’ trading and data businesses, yet the SEC can always consider a worst alternative to a negotiated agreement (**WATNA**) if SROs are unwilling to cooperate. We believe having a **mechanism to encourage social responsibilities** is a key driver to “grow the pie” and foster sustainable development of NMS. Indeed, this is similar to phone plans and mobile device offers in the telecom industry. This “2.5 times threshold” provides “trading venues with sufficient opportunity and **flexibility to innovate**”³, while “ensures that core data **evolves along with the broader market ecosystem**”².

⁴³ https://en.wikipedia.org/wiki/Huffman_coding



④ Motivate and Create Sense of Belonging

We think the Commission proposed 3 sets of fees (1: content; 2: consolidate and dissemination, 3: connectivity) for CCs is commendable because it has a good mix of diversified constituents to participate in pricing decisions. That being said, the underlying issue in the market is not so much of “**demonstrating**” the fairness and reasonableness of those fees per se, but “**achieving**” a fair state of new equilibrium. In other words, there need an answer to the “**Who gets what – and why**”⁴⁴ question in resolving the access fee rebate controversy⁴⁵, finding new revenue stream after online broker race to zero fees⁴⁶, as well as way to prevent Exchanges from commanding premium price or limiting privileges to only a small group of elites²⁰. For that, we envisage, after the era of an arm-race on speed⁴⁷, a new **modernized NMS Plan** would **reward those who are able to innovate and contribute**. To encourage more, especially emerging BDs and average investors, to participate in the market and “grow the pie”, we have to equip these people with the tools, give them an opportunity to trade competitively against the Wall Street Titans.

Context of the Problem

Structurally Bias	access fees subsidy
Lack speed	are not as nimble and fast
Pay to play	rising data and technology costs as competitive barrier

- Technology does not necessarily enhance the flow of information. It can also be used for obfuscation or delay. Indeed, it depends on how it is employed by people who can obstruct development, create inequality through restricted access to information, and pursue rent-seeking behaviors.
- The argument is not only the added quantifiable costs, but also wasting economic resources and opportunities lost due to the perils of bootstrapping data, information disadvantage and non-price competition such as alleged abuses⁴⁸. Indexing/ passive investing is like the ‘Bed of Procrustes’⁴⁹ – a false comfort. Avoidance of 21st century problems nourishes more bad behaviors that deter investor rights.

Weakness - OLD

Advantages – NEW

OLD Practices	Served Purpose	Shortfall
Recalibrate access fees	The pilot is an attempt to change the incentive system	Not able to deter the vested interest groups to back-off. The emergence of new Exchanges may find alternate ways to seek unfair advantages.
Fully and fairly describe proposed fees change	Strong message to warn Exchanges not to exacerbate price differences	Not able to deemphasize speed as a key to trading success. SRO’s rivalry & rent-seeking behavior is like spectrum interference, the public’s interests are inadvertently compromised.
Encourage competition	“attempts” to fix the market with exchanges’ lead innovations	Not sustainable, exchanges imitate market designs causes inability to shift paradigm.

Value	High value, accelerate learning and adoption
Direct	Trade like the Pros in recognizing pattern at super fast speed
Fair	Democratization of technology

These all boils down to:

Tech democratization, enable the crowd, and counter the effect of high fixed costs resulted from drag race

⁴⁴ <https://www.amazon.com/Who-Gets-What-Why-Matchmaking/dp/0544705289>
⁴⁵ https://www.databoiler.com/index_htm_files/DataBoiler%20FeePilot610%20Comments.pdf
⁴⁶ <https://www.cnbc.com/2019/10/04/battle-for-zero-trading-fees-pressures-robinhoods-next-leg-of-growth.html>
⁴⁷ <https://www.amazon.com/Market-Mover-Lessons-Decade-Change/dp/1538745135>
⁴⁸ <https://www.cnbc.com/2018/03/23/bank-of-america-in-42-million-settlement-for-masking-trading.html>;
<https://blog.themistrading.com/2016/02/credit-suisse-and-barclays-record-settlement-with-ag-and-sec/>;
<https://www.sec.gov/litigation/admin/2016/33-10272.pdf>
⁴⁹ <https://www.amazon.com/Bed-Procrustes-Philosophical-Practical-Aphorisms/dp/0812982401>



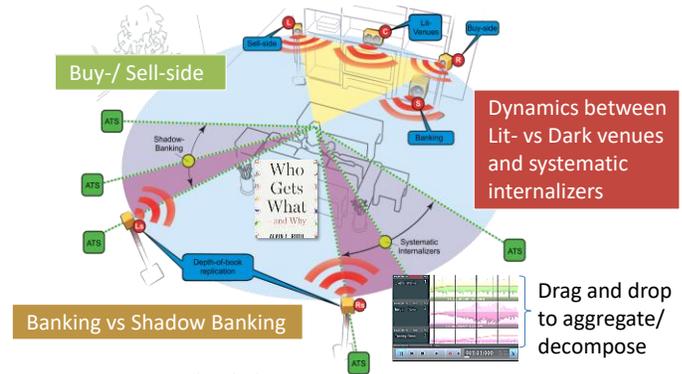
Imagine if SROs may FREELY give out pattern of historical market manipulation or crash events data to the public and academia. For us, we would love the opportunity to work with large retail/ online BDs to offer our patented inventions, so average investors will be equipped to trade like the Pros, to do pattern recognition, be able to compete without the fastest access. There will be a community library of signals that look like this:



Imagine the possibility of leveraging data exhaust from OMS/EMS to relief CAT data submission burden, eliminating the duplication/ triplication of data that increase vulnerability of hackers' attacks, and does not require billion dollar annual up-keeping cost for CAT⁵⁰.

Imagine SEC and FINRA's investigations team may focus their exams and limited resources on 'high risk' trade irregularities, while our automated surveillance will provide BDs a % chance they may get an audit or be certified 'clean' trade activities, saving time and costs for both sides by major in the majors.

Imagine this is also an Early Warning mechanism to deter Flash Crashes⁵¹. Those who are able to discover unknown unknowns⁵² pertaining to crashes or promote financial safety and soundness should get some big rewards.



Rather than settling with today standards (e.g. "multiple NBBOs⁵³ already exist ... would not be novel or insurmountable") or protecting only the business interests of existing encumbrances, we urge policy makers and everyone to think forward, projecting how technologies, market dynamics, and economic opportunities may evolve. Whether it is large institutional traders, average investors, or the CAT users (i.e. SEC and SROs), all can use my patented techniques to do trade analysis and will have a fair and reasonable chance to excel in their performance.

5 Conclusion

We are thankful for Mr. Robert Greifeld whom electronified the markets during his time at NASDAQ⁴⁷, the changes he together with many in the industry had made attributed to tremendous improvements in market efficiency, and in turn, lowered transaction cost in the last decade and a half. We also feel blessed about the resiliency of our marketplaces amid the Coronavirus lock-down. Yet, the old NMS plan over emphasized speed as a key to trading success³ and its inadvertent consequences (e.g. access fee rebate controversy⁴⁵, the previous mentioned fairness issue, plateauing of cost reduction, etc.) have reached a critical point, where the ecosystem's equilibrium must shift again. We get that policy makers would

⁵⁰ <https://www.linkedin.com/pulse/hr-block-analogy-cat-combating-fraud-kelvin-to/>

⁵¹ <https://www.fnLondon.com/articles/investment-banks-not-hfts-fuel-flash-crashes-fca-research-20170803>

⁵² <https://www.pmi.org/learning/library/characterizing-unknown-unknowns-6077>

⁵³ We agree that "discretion in choosing an NBBO could result in uncertainty regarding whether the broker had executed a customer's order at a price that was in the customer's interest or the broker's own interest." The best approach for Best Interest review in the 21st century is via a consistency scan if broker may be treating clients as counterparties rather than through disclosure. See this:

<https://www.linkedin.com/pulse/fiduciary-suitability-best-interest-what-kelvin-to/>



want to introduce competitive forces as way to address “all” forms of content and latency differentials. Solicit buy-in by promising “all” constituents that they will get a fruitful stake at the new equilibrium would be the easy thing to say than done. We think closing latency gap should have a higher priority than including every wish list in the data contents⁶⁵. Be mindful of a “No fish can swim when the water is too clear” situation. That being said, market reform should allocate the most rewards and provide a reasonable return for those who are able to innovate and contribute.

Following summarized our key points and suggestions:

- A. Same manner and methods ≠ Latency equalization ≠ Market data available Securely in Synchronized time;**
- B. Update 17 CFR §242.603 for a synch start-line, eliminate latency difference due to ‘extra hop’ for non-SAs;**
- C. CCs face competition and burden to build expanded SIPs, while SAs benefit from continue fragmentation;**
- D. 3-pillars to align SEC, SROs, and CCs; create interdependency among constituents; grow the pie and be fair;**
- E. Lack mean to negotiate with SROs; who stand to gain from others’ efforts rather than much to contribute;**
- F. Require SROs to maintain a connectivity disparity ratio to ensure CMD evolves along with the ecosystem;**
- G. All-encompassing wish list of contents but status quo remains because no fresh ideas and tech innovations;**
- H. Tech democratization, enable the crowd, and counter the effect of high fixed costs resulted from drag race.**

We hope the above comments and the detailed responds to the Commission’s specific questions below will be helpful to the SEC and benefiting the broader industry. Feel free to contact us with any questions. Thank you and we look forward to engage in any opportunities where our expertise might be required.

Sincerely,

Kelvin To

MSc Banking, MGMT, BSc
Founder and President

Data Boiler Technologies, LLC

CC: The Honorable Jay Clayton, Chairman
The Honorable Hester M. Peirce, Commissioner
The Honorable Elad L. Roisman, Commissioner
The Honorable Allison Herren Lee, Commissioner
Mr. Brett Redfearn, Director, Division of Trading and Markets
Ms. Andrea Orr, Counsel to the Director of Trading and Markets

This letter is also available at:

https://www.DataBoiler.com/index_htm_files/DataBoiler%20SEC%20Market%20Data%20Infrastructure.pdf



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III. Proposed Enhancements to NMS Information

B. Proposed Definition of “Consolidated Market Data”

Question 1

Do commenters believe that the Commission should adopt a definition of consolidated market data? Why or why not? Should the Commission take an alternative approach? Why or why not?

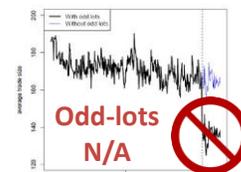
Yes. One cannot manage what cannot be measure or defined, thus this is essential.

Question 2

Does the proposed definition of consolidated market data capture the market data that would be useful to market participants for trading and regulatory compliance purposes? Please explain. Does the proposed definition of consolidated market data include any market data that should not be included? Please explain. The Commission is seeking input from commenters on whether the proposed definition of consolidated market data should include additional market data or whether the definition should otherwise be modified.

Yes and No. Yes, we agree under the proposed Rule 600(b)(19), consolidated market data should be defined as the following data, consolidated across all national securities exchanges and national securities associations: (1) core data; (2) regulatory data; (3) administrative data; (4) exchange-specific program data; and (5) additional regulatory, administrative, or exchange-specific program data elements defined as such pursuant to the effective national market system plan or plans required under Rule 603(b). No, we think additional information that would be required to be collected, consolidated, and disseminated under Regulation NMS are partially acceptable. We are counter proposing:

- (i) **Depth of Book (DOB):** use of a replication of the DOB curve to gain idea about full-depth limit order book that are more indicative of imbalance between supply and demand⁵⁴ than Level 1 data;
- (ii) **Odd-lots:** Yes and no, and it depends. We agreed that protected quote data is important, and understand their supportive of redefining the round lot size for higher priced shares to be some number lower than 100. Yet, policy makers should consider market structure changes outside of this Market Data Infrastructure proposal that will make odd-lots become true “outliers” rather than the “norms” and/or ask for a “delayed” odd-lot trades and quotations statistics, so that experienced market participants may use reverse-engineering methods to “figure-out” or “project” how these odd-lots would play out in sequence. Providing too much information is going to drag the processing time of SIP and CC from a technical perspective. Slowing processing time would mean delaying the availability of proprietary feeds – if everything was tied to a “synchronized decryption mode”. In the interest of deemphasizing speed as a key trading success (while allowing trading venues have sufficient opportunity and flexibility to innovate under Reg. NMS), the industry ought to make some hard gives-and-takes choices in order to major in the majors.



Users will figure out these outliers overtime using reverse engineering

⁵⁴ <http://repository.essex.ac.uk/21296/1/Convolutional%20Neural%20Networks%20Applied%20to%20High-Frequency%20Market%20Microstructure%20Forecasting.pdf> ; <https://arxiv.org/pdf/1602.04423.pdf>



(iii) **Auction Information:** this is a controversial matter. Auction volume is substantial while related market impact is significant. Calibrating market impact in open and close auctions⁵⁵ typically requires specialists’ skills rather than easily comprehend by average investors. Some claimed, “Passive investing juggernaut is forcing investors to pile into crowded auction time – risking market stability”.⁵⁶ We recognized that the SEC, FINRA, SROs and institutional traders might be interested to research on HFT competition and liquidity on batch auction markets versus continuous-time trading.⁵⁷ We also cannot rule out certain retail investors might be interested and have a potential positive impact on auction price discovery process. At the end of day, it boils down to choice. We think there should be 3 choices:

- a) Core data with no auction data but includes CBOE market close orders in order not to drag the processing speed of normal data distribution (i.e. light and fast mainly for retail);
- b) Separate subscription for auction imbalance information per SIFMA’s recommendation⁵⁸ (i.e. matched quantity, imbalance size, near price, far price, paired shares and imbalance shares). Because there is no calculation involved for CCs in this part, we think there is no crossing the line on NASDAQ’s patent⁵⁹. SAs would have to integrate the feeds as they are doing it today.
- c) Integrated auction data in a combined feed while acknowledged that speed may be slower than option (a) and (b), and assuming a reasonable commercial deal will be reached with the Exchange that holds relevant intellectual property rights over its crossing process.

In midst of systemic reform, should not ask for too much

Complete transparency may be detrimental to price discovery

After all, policy makers should strike appropriate balance to avoid a “**No fish can survive when the water is too clear**” situation. Given that, it’s all about optimization to preserve richness of contents while making market data fast, secure and fairly available at reasonable price to market participants.

Question 3

Should the definition of consolidated market data be set forth in an effective national market system plan(s) instead of, or in addition to, Rule 600(b)? Please explain. Do commenters have views on the most appropriate process through which the content of proposed consolidated market data should be expanded or modified? Do commenters believe that the proposed definition of consolidated market data should include a provision stating that additional regulatory, administrative, or exchange-specific program data elements can be defined pursuant to the effective national market system plan or plans required under Section 242.603(b)? Please explain. Should the proposed definition of core data be able to be amended through the effective national market system plan process (for example, should the term “core data” be included in proposed Rule 600(b)(19)(v))? Why or why not? Do commenters believe that any data elements should not require an amendment to the effective national market system plan(s) to be added to consolidated market data? Please explain and describe what process would be appropriate for adding any such data elements.

No objection to setting the definition in NMS plan instead of, or in addition to Rule 600(b), as long as consolidated market data is “light” (see our respond to Q2) and “available **securely** in synchronized time”^{Error! Bookmark not defined.}.

⁵⁵ <https://www.tradersmagazine.com/departments/brokerage/market-impact-in-open-close-auctions/>

⁵⁶ <https://www.marketwatch.com/story/killing-time-the-closing-auction-is-eating-the-trading-day-2019-07-17>

⁵⁷ <http://people.stern.nyu.edu/jhasbrou/SternMicroMtg/SternMicroMtg2016/Papers/36.pdf>

⁵⁸ <https://www.sifma.org/wp-content/uploads/2019/09/File-No.-4-729-SIFMA-Comment-Letter-on-Improving-Market-Data-Structure-September-18-2019.pdf>

⁵⁹ Page 158 <https://www.sec.gov/spotlight/equity-market-structure-roundtables/roundtable-market-data-market-access-102518-transcript.pdf>



C. Proposed Definition of “Core Data”

Question 4

Do commenters believe Rule 600 should be amended to include a definition of core data? Why or why not?

No objection to include a definition of core data to Rule 600, as long as consolidated market data is “light” (see our respond to Question 2) and “available **securely** in synchronized time”¹².

Question 5

Do commenters believe that the Commission’s proposed definition of core data captures the key components of information with respect to quotations for and transactions in NMS stocks that are useful for participating in today’s markets? Are there any other useful market data elements that should be included in the proposed definition? Does the proposed definition include any elements that are not useful for trading? Please explain.

Everyone wants everything if it is free and unconditional, yet we want to major in the majors for what is considered useful and within contexts of market data priorities – (i) First, address the speed differentials; (ii) real-time DOB curve replication; (iii) delayed statistics for Odd-Lots. No one can defy the reality that the need of content richness would come at the expense of latency, and vice versa. It boils down to tradeoffs. Please also see pages 1-11 and our respond to Question 2.

Question 6

Do commenters believe that there is sufficient demand for OTCBB, concurrent use, or other data currently provided by the exclusive SIPs that would not fall within the proposed definition of core data such that an independent market for the provision of this data would develop? Why or why not? Would the SROs or other entities that currently disseminate this data through the exclusive SIPs provide it through other means (i.e., to competing consolidators or directly to interested market participants)? Please explain.

Let OTCBB and corporate bond and index data be excluded in the proposed definition of core data. Again, we want to keep it “light” (see our respond to Question 2) and “available **securely** in synchronized time”¹².

Question 7

The Commission is proposing to include protected quotations in the proposed definition of core data. Do commenters believe that there is a need for a “national protected best bid or offer” analogous to the NBBO that would represent a snapshot of the single best protected bid and single best protected offer from among all the protected bids and offers of each SRO? Would this be a useful metric for competing consolidators to calculate and disseminate for market participants for either routing or regulatory compliance (e.g., the order execution disclosures required under Rule 605) purposes? Would firms that intend to self-aggregate produce such a metric on their own? Please explain.

We have no objection for requiring automated quotations that are the best bid or offer of a national securities exchange or national securities association to be “of at least 100 shares” in order to qualify as a protected bid or protected offer. Yet, the Commission’s proposal to amend the definition of “protected bid or protected offer” in Rule 600(b)(61) is more of an interim approach rather than a permanent fix to Rule 611. Possible modification or repeal of the order protection Rule 611 has been the subject of much debate⁶⁰. In view of SEC’s recent approval of CBOE end-of-day auction proposal despite opposition from NYSE and NASDAQ⁶¹, it seems that providing investors with greater accessibility and cost-efficiency from

⁶⁰ <https://www.sec.gov/spotlight/emsac/emaac-regulation-nms-subcommittee-discussionframework-040317.pdf>

⁶¹ <https://www.fnlonon.com/articles/sec-deals-blow-to-nyse-and-nasdaq-with-ruling-on-4pm-closing-trades-20200122>



an overall NMS perspective triumphed over whether an Exchange have devoted how much resources in developing related processes. This is consistent with the Commission's believe that, "market forces, such as the economic incentives of market participants to obtain the best price and resolve locked or crossed markets, as well as improvements in trading and order routing technology, are sufficient to mitigate excessive locking or crossing of quotations in the new round lot sizes and to resolve such locked or crossed markets efficiently." As a result, non-positive NBBO spread caused by locked and crossed markets⁶² would be eliminated, making it possible to "rely on the duty of best execution to maintain intermarket price protection to rollback Rule 611" per SIFMA's suggestion in the past.⁶³ We think this whole proposition makes good sense, while we feel that "disclosure" is not the best way to ensure best execution. It is not how a broker-dealer "claims" the trades were dealing with a customer or counter-party. Rather, as the trade data would reveal, with consistency, whether the firm was "in effect" acting in the best interest of the customer rather than treating the party as a counter-party (i.e. without fiduciary responsibility). Therefore, an automated system is needed to conduct the "regular and rigorous review" for "best execution" compliance.⁶⁴ We look forward to see if the SROs would address this order protection issue or how competing Exchanges work collectively as one unified NMS in the upcoming New NMS plan³⁶. Hopefully, there will be some consensus reached in the industry by then. In the meanwhile, that metric is irrelevant for CCs per se. CCs would try to steer clear of "calculating" (except NBBO based off Exchanges' BBOs), in order to avoid potential infringement of Exchanges' intellectual property rights⁵⁹. How SAs currently produce the metric for either order routing or regulatory compliance purposes is individual broker's responsibilities.

1. Round Lot Size

(i) Proposed Definition of Round Lot

Question 8

Should odd-lot quotation data that is not currently reflected in SIP data be incorporated into core data, as proposed, and, if so, what is the best way to do so?

No, please refer to our respond to Question 2 and our submitted comments⁶⁵ to SIP operating committees in Nov 2019.

Question 9

Should core data, as proposed, include quotation information for smaller sized orders in higher priced stocks? Why or why not? Does adding this quotation information enhance the usefulness of core data, as proposed? Please explain. What kinds of market participants would use this information? For what purposes? Would the inclusion of this information have any negative or unintended consequences, such as "information overload" effects? Please explain.

Quotation information about orders in share amounts smaller than the current round lot size (e.g., 100 shares) for higher priced stocks enhances the usefulness for certain market participants. Yet, policy makers should consider market structure changes outside of this Market Data Infrastructure proposal to address market phenomenon regarding higher priced stocks. Providing too much information is going to drag the processing time of SIP and CC from a technical perspective. Slowing processing time would mean delaying the availability of proprietary feeds – if everything was tied to a "synchronized decryption mode". In the interest of deemphasizing speed as a key trading success (while allowing trading

⁶² <http://faculty.bus.olemiss.edu/rvanness/Speakers/2004-2005/LockedCrossed-ver11.pdf>

⁶³ <https://www.sec.gov/comments/s7-21-16/s72116-1674693-149275.pdf>

⁶⁴ <https://www.linkedin.com/pulse/fiduciary-suitability-best-interest-what-kelvin-to/>

⁶⁵ https://www.theice.com/publicdocs/DataBoiler_OddLots_Comments.pdf



venues have sufficient opportunity and flexibility to innovate under Reg. NMS), the industry ought to make some hard gives-and-takes choices in order to major in the majors.

Question 10

Do commenters believe the Commission's proposed definition of round lot is an effective way to incorporate this additional quotation information into core data, as proposed? Why or why not? What effect would the proposed definition have on systems capacity? Please explain and provide data. Would the proposed definition affect market complexity? Please explain. Do commenters believe that the proposed definition of round lot appropriately balances the benefits of providing additional quotation data to investors and other market participants against potential costs such as additional system burdens or increased data complexity? If not, please explain how this balance could be more appropriately achieved. Specifically, please provide details on the quantity of additional data or the increase in message traffic that would be represented by the Commission's proposal and any alternative proposals.

We have no objection to the proposed definition of round lot would assign different round lot sizes, and think that it would improve the usefulness of proposed consolidated market data, promote fair competition, and, like the addition of odd-lot transaction data to SIP data, would provide important information to investors and other market participants that would enhance transparency and price discovery. We will do our best to accommodate any system capacity issue. However, we oppose including odd-lots in real-time feed, but counter suggest a "delayed" odd-lot trades and quotations statistics.

Question 11

Are there alternative approaches, such as requiring all or a subset of odd-lot quotations to be included in the proposed definition of core data, or directly requiring all quotes over a certain notional value to be included in the proposed definition of core data (rather than indirectly as in the proposed definition of "round lot")? Please describe any alternative approaches. What would be the advantages and disadvantages of any alternative approaches?

As an alternative approach, we suggest a "delayed" odd-lot trades and quotations statistics. So that experienced market participants may use reverse-engineering methods to "figure-out" or "project" how these odd-lots would play out in sequence.

Question 12

Would the Commission's proposed definition of round lot capture a significant portion of the odd-lot quotation activity that is currently not included in SIP data? Is the definition appropriately tailored to capture the odd-lot quotation information that would be useful to market participants? If not, please identify and discuss alternative approaches that might be more appropriate. For example, do commenters believe round lot sizes and price intervals different from those in the proposed definition would capture more useful odd-lot quotation data? Please include data to support any suggested alternative sizes or price intervals. Please also discuss any issues related to increased order routing complexity or compliance with Commission rules that might result from the proposed definition of "round lot."

Good enough and we think it strikes appropriate balance.

Question 13

Do commenters believe that odd-lot quotes should be aggregated into the new round lot sizes at multiple price levels for the purposes of calculating and disseminating the NBBO in the proposed definition of core data? Why or why not? What are commenters' views on the specific odd-lot aggregation methodology set forth in the proposed definition of core data?



Given we are counter suggesting a “delayed” odd-lot trades and quotations statistics that is separated from core data, therefore, odd-lot quotes should NOT be aggregated into the new round lot sizes at multiple price levels. Adding these aggregated odd-lot quotes for NBBO calculation in the core data would cause unnecessary confusion. NBBO should simply base on BBO provided by Exchanges to minimize any calculation or interference/ influences by CCs.

Question 14

Do commenters agree with the Commission’s proposal to require odd-lot aggregation for purposes of protected quotations only at a single price level? Please explain. Should odd-lots be aggregated only at a single price level for purposes of determining the protected bid and offer for stocks valued at \$50.00 or less based on the prior calendar month’s average closing price on the primary listing exchange even though the round lot for this price tier remains 100 shares (i.e., both the best bid and offer and protected bid and offer must be 100-shares in this price tier)? Should a multiple price level aggregation methodology for determining protected quotations apply to stocks valued at \$50.00 or less? Would there be any costs or negative effects of having different odd-lot aggregation methodologies for stocks at different price levels?

Please refer to our respond to Question 13.

Question 15

Is a price-based metric for determining round lot size an appropriate metric for determining the proposed round lot tiers? Are the proposed tiered round lot sizes appropriate? Why or why not? Should the tiers be set at different intervals? Should there be more or fewer tiers? For example, should the round lot size be one share for any NMS stock for which the prior calendar month’s average closing price on the primary listing exchange was \$500.01 or greater? Why or why not? Are the round lot sizes appropriate for the share prices? If not, what is the appropriate round lot size? Please provide empirical support for any suggested alternatives.

Good enough and we think it strikes appropriate balance.

Question 16

Do commenters believe that a significant number of broker-dealers do not currently subscribe to proprietary market data products, including proprietary market data products that include odd-lot quotations? If so, how many and what type of broker-dealers (e.g., executing broker-dealers, introducing broker-dealers, small broker-dealers, large broker-dealers)? Are there specific types of proprietary market data products to which any such broker-dealers do not subscribe? If so, which types of proprietary market data products? Do any such broker-dealers subscribe to proprietary data products from some exchanges but not others?

This article hopefully provide some insights: <https://flextrade.com/consolidated-market-data-feeds-surpassing-sip-in-trading/> but unfortunately no specific statistics is publicly available. Maybe the SEC should mandate the SROs to provide some transparency here.

Question 17

Do commenters have views on the odd-lot proposal released by the operating committees of the Equity Data Plans? What are the advantages and disadvantages of the proposal by the Equity Data Plans as compared to the Commission’s proposed definition of round lot?

Please refer to our respond to Question 8.



Question 18

Each of the proposed tiers represent a notional value of over \$1,000. Is this an appropriate threshold? Should it be higher or lower? Please explain and submit data to support your analysis.

Good enough and we think it strikes appropriate balance.

Question 19

Do commenters believe that the prior calendar month's average closing price on the primary listing exchange (or IPO price if the prior calendar month's average closing price is not available) is an effective way to assess the price of a stock for purposes of determining its round lot size? Why or why not? Do commenters believe it would be costly, difficult, or problematic for market participants to adjust procedures and systems to take into account new round lot sizes based on the prior calendar monthly average closing price on the primary listing exchange, or to account for a particular stock's potentially different round lot size every month? Are there alternative time periods over which a stock's price for purposes of assigning a round lot size should be measured or alternative methods for measuring a stock's price that the Commission should consider? When should a stock whose price changes from one tier to another be assigned to a new round lot size and for how long should it remain in that round lot size? Would stocks priced near the thresholds that differentiate the round lot tiers be affected by frequent shifts between round lot sizes? Please explain.

Good enough and we think it strikes appropriate balance. The industry should accommodate changes pertaining to new round lot sizes based on the prior calendar monthly average closing price on the primary listing exchange, or to account for a particular stock's potentially different round lot size every month. It should not be too much hassle as long as the requirements are being clear.

Question 20

During the month following the IPO of a newly listed stock, should a minimum number of trading days be required to elapse before the stock's round lot size is determined? If so, should the average daily closing price on the primary listing exchange (or some other metric) over the course of that number of trading days be used to calculate the stock's price for purposes of determining its round lot size? If so, how would the stock's round lot size be determined in the interim?

We tend to think: no round lot size information until there is a prior full calendar month's average closing price on the primary listing exchange was \$500.01 or greater. Yet, we remain flexible to accommodate whatever minimum number of trading days as required by the industry and the SEC.

Question 21

Do commenters have views on how monthly average closing price should be determined for stocks that are not traded every day? Should the closing price of the most recent trading day on which there was a trade be used each intervening day until the stock is traded again?

Please refer to our respond to Question 20.

Question 22

Do commenters believe that the impacts of the proposed definition of round lot on the Commission rules described above are appropriate? Why or why not? Will any SRO rules be affected? Please explain. Specifically, please describe any effect of the proposed definition of round lot on market maker quoting obligations under SRO rules.

Good enough and we think it strikes appropriate balance.



Question 23

Should the proposed definition of round lot apply to Rules 602 and 604? Do commenters believe the applicability of the proposed smaller round lot sizes to these rules will help foster more displayed quotations of small orders? Do commenters believe this will result in a significant tightening of quoted spreads?

We agree that the bids and offers collected and made available under Rule 602(a) should be in the proposed round lot sizes, and the proposed round lot definition should apply to the obligations of responsible brokers or dealers under Rule 602(b). We have no opinion regarding Rule 604. Unlike stock split, changing the round lot size definition does not change the demand and supply fundamental. Therefore, as the industry accustoms to the new definition, there should be no effect on tightness of quoted spreads in theory.

Question 24

Should the Commission amend Rule 605 in light of the proposed round lot definition? Specifically, since the disclosures required by Rule 605 must be “categorized by order size,” which currently begins at 100 shares, should the definition of “categorized by order size” be amended to require the relevant execution information to be provided for sub-100 share orders, such as orders in the proposed round lot sizes? Do commenters believe this would negatively or positively affect the execution quality statistics provided pursuant to Rule 605? More broadly, do commenters believe the proposed definition of round lot would improve the actual prices provided to retail investors (as distinct from the Rule 605 execution quality statistics)?

The industry may require some transition time on this, but we agree that NBBO, as modified by the proposed definition of round lot, should continue to be used as a basis for the statistics required under Rule 605 amid “the Commission is not persuaded by concerns about the introduction of multiple NBBOs (by DCM)”. Yet, we feel “disclosure” is not the best way to ensure best execution regardless of round lot size definition. It is not how a broker-dealer “claims” the trades were dealing with a customer or counter-party. Rather, as the trade data would reveal, with consistency, whether the firm was “in effect” acting in the best interest of the customer rather than treating the party as a counter-party (i.e. without fiduciary responsibility). Therefore, an automated system is needed to conduct the “regular and rigorous review” for “best execution” compliance.⁶⁴ After all, changing definition should, in theory, be indifference to execution quality.

Question 25

Should the proposed definition of round lot apply to Rule 610(c)? Specifically, should the fee limits under Rule 610(c) apply to quotations in the proposed new round lot sizes? Would exchanges or other trading centers increase access fees for the smaller round lots if Rule 610(c) were limited to 100-share protected quotations? Why or why not? Do commenters believe that market forces would provide sufficient control over access fees for quotations in the smaller round lots? Why or why not? Should Rule 610(c) be limited to the Commission’s definition of protected bid or protected offer, as amended? What would be the benefits and costs of each approach?

We agree that applying the fee limitations of Rule 610(c) to orders of meaningful size, as reflected in the proposed definition of round lot, would further that rule’s objectives of ensuring the accuracy of displayed quotations by establishing an outer limit on the cost of accessing them. Therefore, Rule 610(c) should apply to quotations in the proposed round lot sizes. Exchanges would maneuver around access fees and other product pricing schemes anyway regardless of change to round lot size definition. Rent seeking is the nature of for-profit Exchanges¹⁸, so the right question to ask instead should be “Who owns the data? Should market participants (and how) be compensated when CCs sell market data?”²⁰ Please see [Figure 2](#) & [④](#) for an elaborated discussion on “who gets what and why”⁴⁴ in this NMS reform.



Question 26

Should the proposed definition of round lot apply to Rule 201 of Regulation SHO? Would the scope of Rule 201 be expanded as a result of the proposed definition of round lot in a way that would unnecessarily restrict the ability of market participants to sell short? Will additional or excessive order routing complexity result from the application of Rule 201 to quotations in the proposed smaller round lot sizes? Should “protected bid,” as proposed to be amended, rather than the national best bid be used as the reference price for determining which short sales are required to be prevented under Rule 201? What would be the benefits and costs of each approach?

It makes sense that Rule 201 of Regulation SHO should also be updated given NBBO will be modified by the proposed definition of round lot, amid “the Commission is not persuaded by concerns about the introduction of multiple NBBOs (by the DCM)”. Just that the industry have learnt and accumulated much experience through the current economic turmoil caused by the Coronavirus pandemic, revisiting Regulation SHO circuit breaker is inevitable. So we would not worry about complexity issue. We do not want unnecessary restriction on market participants’ ability to short sell⁶⁶. We do think NBB is a better choice than “protected bid” as the reference price despite costs might be indifference.

Question 27

Do commenters believe that the proposed definition of round lot would have any effect on an exchange’s official closing prices? Would the proposed definition of round lot have any effect on the pricing practices of mutual funds and other investment companies, including the calculation of net asset value or trading in portfolio securities? Please explain the potential costs and benefits of any such effects.

Any effect would ultimately be subsided as the industry accustoms to the new definition and because there is no fundamental change to supply and demand. Mutual funds and other investment companies might be opportunistic on pricing practices in the short-term when revise definition is introduced. Exchange closing prices would always be battle ground regardless of this change.

Question 28

Do commenters believe that the proposed definition of round lot would affect the proportion of on-exchange or off-exchange liquidity? Please explain.

Again, people will be opportunistic in the short-term. Yet, there is no fundamental change in supply and demand. Hence the overall liquidity would be indifference, while on-exchange liquidity may improve at the expense of off-exchange for certain securities that are over reliance on ATs to move blocks.

(ii) Proposed Amendments to the Definition of Protected Bid or Protected Offer

Question 29

Do commenters believe that the Commission’s proposed amendments to the definition of protected bid or protected offer are an effective way to continue to require order protection for 100 share orders but not for smaller orders, or would an alternative be better? Please explain.

We have no objection if the Rule continues to require order protection for 100 share orders but not for smaller orders. Rule 611 is controversial, noting that SIFMA has suggested “relying on the duty of best execution to maintain intermarket price protection to repeal Rule 611, or modify it to add volume thresholds for protected quote status and a block

⁶⁶ <https://www.cnn.com/2020/03/30/sec-chairman-jay-clayton-short-selling-should-not-be-banned.html>



exception.”⁶³ As mentioned in our respond to Q7, we look forward to see if the SROs would address this order protection issue or how competing Exchanges work collectively as one unified NMS in the upcoming New NMS Plan³⁶. Whether to emphasize or deemphasize on Internalizers’ role is something up for debate.

Question 30

Do commenters believe that the definition of NBBO should reflect the proposed round lot sizes or should it remain consistent with the 100-share protected quotation? Why or why not?

We have no objection on the definition of NBBO that reflects the proposed round lot sizes, amid the Commission is not persuaded by concerns about the introduction of multiple NBBOs. We expect the Commission’s proposal to amend the definition of “protected bid or protected offer” in Rule 600(b)(61) is more of an interim approach rather than a permanent fix to Rule 611. So, it is okay to live with this inconsistency. Per our respond to Question 7, we envisage that the SROs would address the order protection issue or how competing Exchanges work collectively as one unified NMS in the upcoming New NMS Plan³⁶.

Question 31

Do commenters believe that Rule 611 should be extended to orders in the smaller round lot sizes set forth in the proposed definition of round lot? Why or why not? If Rule 611 were to be extended to the proposed smaller round lot sizes, would there be any negative or unintended consequences? Please explain in detail.

Again, reference to the SIFMA’s suggestion about “modifying Rule 611 to add volume thresholds for protected quote status and a block exception”⁶³, extended Rule 611 to orders in the smaller round lot sizes seem contrary to that. That being said, we are talking only the round lot size for the twelve stocks that currently have round lot sizes less than 100 shares could also change as a result of the proposed amendments, why waste so much effort from a cost and benefits standpoint. Please see our respond to Question 7 for an elaborated discussion on the order protection topic.

Question 32

Do commenters believe it would be costly for market participants to adjust procedures and systems to comply with Rule 611 and prevent trade-throughs at the smaller round lot sizes? Please describe the necessary changes and any consequent costs in detail.

Suggest not to complicates this for now, while await the SROs to come up with new NMS plan³⁶ that hopefully some consensus will be reached to address the order protection issue. Cost is one thing, while holding back the time for market data infrastructure improvement is more of our concern.

Question 33

Do commenters believe it would be costly for market participants to adjust procedures and systems to comply with Rule 611 and prevent trade-throughs at 100 share order sizes when the new round lot size may be smaller? Please describe the necessary changes and any consequent costs in detail. Please also discuss how this differs meaningfully from today, if at all, for market participants that are currently using proprietary data feeds that include odd-lot information.

Again, suggest not to complicates this for now, while await the SROs to come up with new NMS plan³⁶ that hopefully some consensus will be reached to address the order protection issue. Cost is one thing, while holding back the time for market data infrastructure improvement is more of our concern.



Question 34

Do commenters believe that the best execution obligation, combined with the greater transparency that the Commission is proposing for smaller-sized orders in higher-priced stocks, is sufficient, in the absence of the order protection rule, for market participants to engage with the liquidity represented by orders in the proposed round lot sizes to obtain the best execution for smaller-sized customer orders?

Rely on the duty of best execution to maintain intermarket price protection⁶³ to “rollback” or allow “absence” of the order protection rule makes sense. Please see our respond to Question 7 for an elaborated discussion on the topic.

Question 35

Should the Commission maintain the applicability of Rule 611 to the small number of stocks that currently have a round lot other than 100? Why or why not?

Again, suggest not to complicate this for now, while await the SROs to come up with new NMS plan³⁶ that hopefully some consensus will be reached to address the order protection issue. We do not want to hold back the time for market data infrastructure improvement.

Question 36

Do commenters agree with the proposal not to extend Rule 610’s locking and crossing requirements to orders with the proposed smaller-round lot sizes? If not, why not? Do commenters have views or data on the frequency with which smaller-sized orders would be locked or crossed? Please explain. Would it be costly to apply locking and crossing prevention mechanisms to the new round lot sizes? Please explain.

Please refer to our respond to Question 7 regarding elimination of non-positive NBBO spread caused by locked and crossed markets²⁷.

(iii) Proposed Amendments to the Definition of National Best Bid and National Best Offer

Question 37

What are commenters’ views on the proposed amendments to the definition of national best bid and national best offer? Do the proposed amendments make appropriate adjustments to the definition to accommodate the proposed introduction of a consolidated market data distribution model with competing consolidators and self-aggregators? Are any additional amendments needed, whether to the definition of NBBO or to other provisions? Please be specific.

Good enough and we think it strikes appropriate balance amid “the Commission is not persuaded by concerns about the introduction of multiple NBBOs (by the DCM)”. Having a metric that shows “national protected best bid or offer” analogous to the NBBO is irrelevant for CCs per se. How SAs currently produce the metric for either order routing or regulatory compliance purposes is individual broker’s responsibilities. Please see [Table 2](#), [Figure 1](#), [Figure 2](#), and [4](#) regarding dynamics among SROs, CCs, SAs, and other market participants.

2. Depth of Book Data

Question 38

Should depth of book data be included in the proposed definition of core data? Why or why not? Do commenters believe the proposed definition of depth of book data would have any negative or unintended consequences? Why or why not?



Yes, top of book (TOB) is really insufficient. We advocate for use of a replication of the DOB curve to gain idea about full-depth limit order book that are more indicative of imbalance between supply and demand⁵⁴ than Level 1 data. We understand Level 1 (5 price levels) data are more commonly subscribed, or trades seldom happen at the 10 or more price levels down. Yet Level 2 quotes are especially useful when comparing different instruments, identify anomalies across markets and how market dynamics are changing over time. Besides, more granular simulation analysis by analyzing actual fills at the best bid/ask and using full level 2 data depth of book data⁶⁷ than level 1 or TOB.



In fact, we are mindful that a **“No fish can survive when the water is too clear”** situation. Therefore, we recommend the use of a replication of the DOB curve to strike appropriate balance. Replication of the DOB curve indeed can be handled faster than level 1 data, which make it more suitable to address the latency race. It preserves the richness of contents without compromising on the confidentiality of trading strategies. After all, making market data fast, secure and fairly available at reasonable price to market participants should be the priority over the other data requests. Please also see our responds to Question 2 and Question 5.

Question 39

Do commenters believe that the Commission’s proposed definition of depth of book data captures the appropriate level of depth data that should be included in the proposed definition of core data? Why or why not? Should the Commission include more or fewer levels of depth or otherwise revise the definition to capture the key depth information that would be useful to market participants? For example, should the Commission require depth only within a \$0.05 band of the protected bid and offer rather than the first five price levels at which there is interest?

We can accommodate the Commission’s proposed definition of depth of book data. Yet, we would like to counter propose for the use of a replication of the DOB curve. Please see our respond to [Question 38](#).

Question 40

Does the proposed definition of depth of book data adequately balance the need for more information against potential increases in complexity and processing demand that might result from the addition of such depth of book data? If not, where is this balance most appropriately struck in terms of the extent of depth of book data that should be included in the proposed definition of core data? Particularly, what processing demands would be associated with including varying levels of depth of book data? Please consider the proposed five levels of depth of book as well as any other possible depth of book alternatives. Please provide quantitative data and analyses to support your comments.

We have no objection to the Commission’s proposed definition of depth of book data. We are also mindful that this compete directly with the Exchanges’ level 1 proprietary data subscriptions. Given that, we are not sure if large Exchange Groups would be willing to let go of their stakes. Our counter proposal for the use of a replication of the DOB curve would probably strike better balance and optimizing speed to help address latency differential issue. Please see our responds to Question 2, Question 5 and Question 39.

Question 41

Do commenters believe that the “at which there is a bid or offer” language in the Commission’s proposed definition of depth of book data establishes an appropriate minimum size threshold (i.e., the existence of at least a round lot of

⁶⁷ <http://www.smallake.kr/wp-content/uploads/2016/05/SSRN-id2778743.pdf>



aggregated interest) for inclusion as one of the five price levels? Why or why not? Are there alternative ways to set such a threshold, such as price levels where the volume of interest equals a certain percentage of the volume at the best price?

We are okay to adopt such definition that establishes an appropriate minimum size threshold. Yet again, we suggest an alternative approach to use a replication of the DOB curve. Please see our respond to Question 39.

Question 42

Do commenters believe that odd-lot quotes at the depth price levels that aggregate into at least a round lot should be included in the proposed definition of core data? Why or why not?

Yes, but we would like the SEC and the industry to consider our alternative suggestion to use a replication of DOB curve.

Question 43

The proposed definition of depth of book data refers to depth of book quotations on each national securities exchange, as FINRA's Alternative Display Facility ("ADF") currently does not have quotations submitted to it. Should the proposed definition be formulated to include the depth of book quotations of national securities associations as well to account for the possibility of OTC quotes being reported to the ADF in the future? Why or why not?

We believe if OTCBB quotation and transaction data and certain "concurrent use" data (i.e. corporate bond and index data) would not be included in NMS market data under the proposal, then we would lean toward excluding the possibility of OTC quotes being reported to the FINRA's ADF for now. We prefer to keep the core data light and fast. While ancillary data may be a separate feed, we will make sure it is scalable and easy to aggregate through our patented propagation techniques if it is needed.

3. Auction Information

Question 44

Do commenters believe that auction information should be included in the proposed definition of core data? Why or why not? What kinds of market participants will use this information? For what purposes? What are the advantages or disadvantages of including auction information in proposed core data as opposed to proprietary data?

As mentioned in our respond to Question 2(iii), auction information is a controversial matter. Auction volume is substantial while related market impact is significant. Calibrating market impact in open and close auctions⁵⁵ typically requires specialists' skills rather than easily comprehend by average investors. Some claimed, "Passive investing juggernaut is forcing investors to pile into crowded auction time – risking market stability".⁵⁶ We recognized that the SEC, FINRA, SROs and institutional traders might be interested to research on HFT competition and liquidity on batch auction markets versus continuous-time trading.⁵⁷ We also cannot rule out certain retail investors might be interested and have a potential positive impact on auction price discovery process. At the end of day, it boils down to choice. We think there should be 3 choices:

- a) Core data with no auction data but includes CBOE market close orders in order not to drag the processing speed of normal data distribution (i.e. light and fast mainly for retail);
- b) Separate subscription for auction imbalance information per SIFMA's recommendation⁵⁸ (i.e. matched quantity, imbalance size, near price, far price, paired shares and imbalance shares). Because there is no calculation involved for CCs in this part, we think there is no crossing the line on NASDAQ's patent⁵⁹. SAs would have to integrate the feeds as they are doing it today.



- c) Integrated auction data in a combined feed while acknowledged that speed may be slower than option (a) and (b), and assuming a reasonable commercial deal will be reached with the Exchange that holds relevant intellectual property rights over its crossing process.

Question 45

Do commenters believe that the lack of auction information in current SIP data creates significant information asymmetries between users of current SIP data and users of proprietary data products? Do commenters believe that current SIP data is sufficient to meet the needs of some market participants even though it does not include auction information? Please explain.

The asymmetries of auction information currently in SIP data versus proprietary data products are obvious for institutional traders. We cannot rule out certain retail investors might be interested and have a potential positive impact on auction price discovery process. Yet, Exchanges are powerful suppliers; the SEC's proposal gives nothing for anyone to reasonably negotiate. Besides, NASDAQ's intellectual property rights must be respected. As much as we think auction information would be a good revenue source for CCs, we are not sure if large Exchange Groups would surrender their lucrative stakes. That being said, SEC's recent approval of CBOE end-of-day auction proposal despite opposition from NYSE and NASDAQ⁶¹, this seems to be a way out enabling investors with greater accessibility and cost-efficiency if large Exchange Groups are unwilling to give in. Therefore, we envisage CBOE market close order will be included in the option (a) offer. Please see either Question 2 or Question 44 for an elaborated discussion on the auction information topic.

Question 46

Does the lack of auction information in current SIP data create impediments to achieving best execution when participating in auctions? Do market participants believe that it is possible to participate in auctions without the auction information? Please explain.

Yes, it would create impediments to achieve best execution when participating in auctions. The alternative is to use CBOE market close order.

Question 47

What are commenters' views on the Commission's proposed definition of auction information? Does it capture the full range of auction-related information that market participants need for informed trading in auctions? Does it include any information that is not necessary or useful for informed trading in auctions? Should the Commission delineate specific data elements in the definition of auction information as opposed to defining auction information in terms of the auction information that is currently generated pursuant to exchange rules or effective national market system plans?

This will be our recommended option (b) and we are in line with SIFMA's recommendations, "At minimum, auction imbalance information shall include matched quantity, imbalance size, near price, far price, paired shares and imbalance shares."⁵⁸ Please see either Question 2 or Question 44 for an elaborated discussion on the auction information topic.

Question 48

Should the proposed definition of auction information include information on orders participating in non-auction matching processes, such as Cboe's market close order, that are related to auctions occurring on other exchanges? Why or why not?

Yes, we think CBOE would be very happy about it while NASDAQ and NYSE won't. Reality is: NASDAQ and NYSE should reasonably be submissive to strike commercial deals with CCs in providing auction information (i.e. our recommended option (c), and please see either Question 2 or Question 44 for an elaborated discussion on the auction information topic).



D. Proposed Definition of “Regulatory Data”

Question 49

Do commenters believe that the elements of proposed regulatory data enumerated in proposed Rule 600(b)(77) reflect the elements that are necessary for trading in compliance with Commission rules, Equity Data Plans, or SRO rules? Why or why not? Should any additional data elements be included? Is there any significant regulatory information that is currently included in SIP data, including pursuant to the technical specifications to the Equity Data Plans, which is not captured by the proposed definition of regulatory data? If so, should such elements be included in the proposed definition of regulatory data? Please describe.

Yes, because consistency in making its determination regarding whether the Short Sale Circuit Breaker has been triggered and avoiding any appearance of “gaming” or “cherry-picking” of core data in making that determination is important. We will cooperate with the SEC and SROs to best support the process.

Question 50

Should any of the proposed elements of regulatory data be excluded? Please explain.

No, the current pandemic crisis shows how important these regulatory data are.

Question 51

Do commenters believe that the primary listing exchange should be responsible for calculating regulatory data, as defined? Why or why not? Would any of those responsibilities be more effectively allocated to competing consolidators? Do commenters believe another party should perform these calculations? Would the proposed definition of regulatory data impose any additional costs on primary listing exchanges?

Yes, the primary listing exchange should be responsible for calculating regulatory data, as defined. We think that is part of the SROs’ obligations to operate as for-profit Exchanges, not CCs.

Question 52

In the context of the Short Sale Circuit Breaker, what benefits and/or challenges do commenters believe will result from the proposed change to a competing consolidator/self-aggregator model? Do primary listing exchanges anticipate utilizing a consistent source of core data in making their determination regarding whether a Short Sale Circuit Breaker has been triggered? Or multiple sources? Please describe.

If CCs would be required to consolidate and disseminate this information to their subscribers regarding whether a Short Sale Circuit Breaker has been triggered, the primary listing exchanges must use “one consistent and designated source” of core data in making that determination and do the necessary calculation. Indeed, we think the Commission’s estimate of twelve CCs would be too much competition. In order to establish viable role of CCs in the economy, the dynamics between CCs, SROs, and SAs require appropriate alignments.

Question 53

Will updating the primary listing exchange’s existing Rule 201 written policies and procedures, as discussed above, present any operational (or other) challenges? If yes, please describe.

We have no comment regarding this SROs’ specific question.



Question 54

Would a round lot size indicator be useful to market participants and investors? Why or why not?

We tend to think this is unnecessary because trading systems would likely have this already build-in.

Question 55

Do commenters believe that the primary listing exchange that has the largest proportion of companies included in the S&P 500 Index should be required to perform the MWCB-related functions described in the proposed definition of regulatory data? Why or why not? Should the primary listing market be determined by weighting the companies included in the S&P 500 Index? Why or why not? Do commenters believe that at least one other market should calculate this information as a backup contingency? Are there alternative approaches to the assignment of the S&P 500 Index monitoring and notification function? Would it be more appropriate to assign this function to another party? If so, please explain how any such other party could appropriately perform this function.

Yes, because that is part of the SROs' obligations to operate as for-profit Exchanges. Yes, the primary listing market should be determined by weighting the companies included in the S&P 500 Index because they are performing the MWCB-related functions anyway. Backup contingency does not need to be handled by separate entity; we assume Reg. SCI already mandated essential business continuity and disaster recovery requirements.

Question 56

Do commenters believe that each national securities exchange and national securities association receiving a quote outside the price bands under the LULD Plan should be required to flag each quote as non-executable? Why or why not? Are there alternative approaches to the assignment of the non-executable quote flagging function? Would it be more appropriate to assign this function to another party? If so, please explain how any such other party could appropriately perform this function.

Yes, each national securities exchange and national securities association receiving a quote outside the price bands under the LULD Plan should be required to flag each quote as non-executable. SROs have direct and immediate access to this executable or non-executable information and could efficiently integrate it into the data feeds that they will utilize to make available the data necessary for competing consolidators and self-aggregators to generate core and other regulatory data, so they would be well-situated to do the flag. We do not see any other party can perform this same function.

E. Proposed Definition of "Administrative Data"

Question 57

Do commenters believe that the Commission should propose a definition of administrative data? Why or why not? Should the Commission take an alternative approach? Why or why not?

Yes, administrative messages facilitate the efficient and accurate use of consolidated market data by market participants. Hence it should be included in the proposed definition of consolidated market data.

Question 58

Do commenters believe that the proposed definition of administrative data captures the market data that would be necessary or useful to market participants? Please explain. Does the proposed definition of administrative data include any market data that should not be included? Please explain.



Yes, administrative data as currently exists, provides additional context for market participants to understand, and efficiently and accurately use, the proposed core and regulatory data to support their trading activities. That being said, there can be streamlining opportunity for CCs to eliminate any repetitive information during distribution and recipients should have a choice to opt-out.

Question 59

Do commenters believe that each national securities exchange and national securities association should make available administrative data? Should any of the elements be provided by the primary listing exchange? Are there specific administrative data elements that should be consistent across all SROs? Are there any administrative data elements that competing consolidators or some other party, as opposed to national securities exchanges and national securities associations, should be required to generate or provide for inclusion in proposed consolidated market data? Please explain.

We have no comment regarding this SROs' specific question.

Question 60

Do commenters believe that there are administrative data elements that should not require an NMS Plan amendment for inclusion in consolidated market data? For example, are there administrative data elements that are provided solely in the course of providing or utilizing other consolidated market data elements, such as core or regulatory data? Please explain. What procedural mechanism would be appropriate for including any such data elements in consolidated market data? How could any such data elements be distinguished from those which would require an NMS Plan amendment to be added to consolidated market data?

Preferably to go through the same NMS Plan amendment process for inclusion in consolidated market data, but we remain flexible to accommodate different procedural mechanism.

F. Proposed Definition of “Exchange-Specific Program Data”

Question 61

Do commenters believe that the proposed exchange-specific program data should be included in proposed consolidated market data? Why or why not?

We are okay to include existing retail liquidity programs to continue be included in proposed consolidated market data. Yet, there should be procedural mechanism to review if there might be other new exchange-specific program information to be included in the future.

Question 62

Do commenters believe that information related to retail liquidity programs currently established pursuant to exchange rules should be included in the proposed definition of exchange-specific program data? Why or why not? Do commenters believe that the inclusion of data elements related to these programs in current SIP data is useful for trading or investment decisions? Please explain.

Yes, we agree the dissemination of retail liquidity identifiers encourages market participants to submit orders to, or otherwise participate in, such programs.



Question 63

Do commenters believe that the proposed definition of exchange-specific program data should permit data elements related to new exchange-specific programs that may be established to be included in consolidated market data pursuant to amendments to the effective national market system plan or plans required under Section 242.603(b)? Why or why not?

We think there should be procedural mechanism to review if there might be other new exchange-specific program information to be included in the future. We do not want to overwhelm what is covered under Section 242.603(b).



IV. Need for and Proposed Enhancements to Provision of Consolidated Market Data

B. Proposed Decentralized Consolidation Model

1. Access to Data

Question 64

Should the SROs be required to provide all of their market data with respect to NMS stocks to competing consolidators and self-aggregators? Should the SROs charge fees based on the use of the data, e.g., fees for proposed consolidated market data set by the effective national market system plan(s) and fees for proprietary data set by individual SROs? Should the SROs only be required to provide the market data that is necessary to generate and calculate proposed consolidated market data? Or, should the determination as to how best to provide the market data that is necessary to generate and calculate proposed consolidated market data be left to the discretion of SROs? What are the benefits and costs of each of these potential approaches?

It would be ideal if SROs can provide all their market data with respect to NMS stocks to CCs and SAs for FREE. Yet, there is no commercially justified reason for Exchanges to surrender their revenue stakes unless there is a regulatory mandate to “split” their trading and data businesses²⁸ in view of potential exploitations on economy of scope. Exchanges are powerful suppliers, while the SEC’s proposal gives nothing for anyone to reasonably negotiate. No one can defy the reality that the need of content richness would come at the expense of latency, and vice versa. It boils down to tradeoffs. We suggest a 3-pillars model to align the interests of regulators, SROs, CCs, and the industry at large (see [Figure 1](#)).

How best to provide the market data that is necessary to generate and calculate proposed consolidated market data cannot be left to the sole discretion of SROs. Requiring SROs to “*provide the essential market data and perform related calculations that are necessary and suitable for CCs to reasonably deliver the proposed consolidated market data*” seems to be a better choice of words that we would suggest. At the end of date, there has to be a reasonable “price” to strike a commercial deal before the SROs willing to turnover their lucrative stake to give CCs a viable chance to survive.

Question 65

Should the SROs be required to offer both proposed consolidated market data and proprietary data to competing consolidators from the same platform and using the same technology infrastructure at an exchange data center for both products?

NO, we are **rebuking** the so-called “**same manner same methods**” approach because:

Collocation¹⁰ ≠ Latency Equalization (LEQ)¹¹ ≠ Market Data Available SECURELY in Synchronized Time¹²

Again as mentioned in the beginning of this letter, updating 17 CFR §242.603(a) is essential to properly “protect” these valuable real-time data³⁵ and promote the fair and reasonable, as well as non-discriminatory principles. This is also a way to enable the industry to have reasonable mean to negotiate with the powerful SROs, large Exchange Groups in particular. Merely approving the new SIP operating committee governance structure³⁶ is insufficient to foster the two sides come to reasonable agreement. Giovanni Cespa and Thierry Foucault’s empirical research – “Sale of Price Information by Exchanges: Does it Promote Price Discovery”¹⁸ already pointed out:

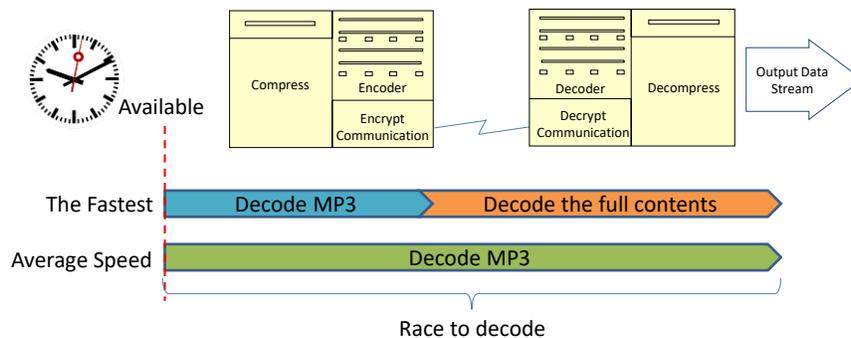
“Exchanges may optimally restrict access to price information for rent seeking behaviors.”



As mentioned in our Dec 2019 comments¹⁵ in, guidance¹⁶ on SRO rule filings relating to Fees serves to send strong message to tell SROs that the SEC is watching market data prices increases. However, no further exacerbating of market data price differences has NOT been achieved¹⁷ and the guidance does NOT ensure a fair and efficient access.

Online gaming and other industries already put in place latency equalization measures¹¹, it will be a shame if our World-class capital markets are not even pursuing a “secured synchronized start time” when considering what will be the NMS for the next decade if not quarter century. Policy makers **blindly believe in “drag race”** competition (among CCs and with also with other constituents) over an ever faster transmittal speed using microwave⁷, laser⁸, quantum⁹ technologies, etc. would **only benefit the telecom companies**, but never solve this entrenched, unfair, and discriminatory matter.

Widening the **gap between the “have” and “have not”** favors the HFTs and hurt the average investors. What the industry need is shield protection for everyone and not another ultra-fast bullet to harm one another. “Same manner and methods” if **without putting the right parameters to bound performance may merely be a “standard price list”** for market data and connectivity offers by a particular Exchange.¹⁰ Different Exchanges may use different time-locks¹⁴ to make market data available **securely** in synchronized time¹², but mandating the secure synchronization of “start time” would prevent anyone from having an **unfair advantage** at the starting line. That being said, HFTs using high performance computers to decrypt data may still have an edge assuming same full contents of core data and same data compression method.



Using traditional techniques that exploit statistical redundancy, Huffman coding⁴³, or probability method to represent and compress market data yield only 5% to 20% reduction in size of original stream. Our patented techniques can do up to 60% reduction in size of original stream by **altering data format** and **compression methods**. Together with some tradeoffs for what constitute as essential contents of core data, a **fair race** among different players is possible under certain conditions.

Question 66

Should the SROs be required to offer both proposed consolidated market data and proprietary data to competing consolidators from the same platform and using the same SRO infrastructure where the pricing model for the different products is based on data use as opposed to being based upon distinct data feeds?

“Same manner and methods” if **without putting the right parameters to bound performance may merely be a “standard price list”** for market data and connectivity offers by a particular Exchange.¹⁰ Widening the technology gap between the “have” and “have not” favors the HFTs and hurt the average investors. Online gaming and other industries already put in place latency equalization measures¹¹, it will be a shame if our World-class capital markets are not even pursuing a “secured synchronized start time”¹² when considering what will be the NMS for next decade if not century. Please see our respond to Question 65 for an elaborated discussion.



Question 67

Should the SROs be permitted to process their market data before providing it to competing consolidators and self-aggregators? For example, should the SROs be permitted to aggregate odd-lots before providing data to competing consolidators and self-aggregators? If so, why and to what extent? Should such processing only be allowed to the extent that it does not result in any latency differential between processed and unprocessed data? Alternatively, should such processing be required to facilitate ease of use for certain customers?

It depends on how “process” is defined, but most important of all, SROs must ensure the “secure availability of market data in synchronized time”, given the fair and reasonable, as well as non-discriminatory principles of 17 CFR § 242.603. That way, it would prevent any unnecessary arguments of what constitute as permissible “process” or not, as well as avoid the continuous fight of who may have an edge at the start line.

After all, SROs do need to aggregate odd-lots rather than it being a responsibility of CCs. Therefore, when SROs are going to share non-aggregated odd-lots information to anyone, it has to synch-up the time when SROs are making round lot size information available to CCs. That being said, we do oppose including odd-lots in real-time feed, but counter suggest a “delayed” odd-lot trades and quotations statistics, please see our responds to Q8-11 for further explanations.

Question 68

Should exchanges be required to permit co-location of competing consolidators and self-aggregators within their data centers? If so, should the fees charged for such colocation be subject to the effective national market system plan(s) for NMS stocks?

Collocation¹⁰ ≠ Latency Equalization (LEQ)¹¹ ≠ Market Data Available SECURELY in Synchronized Time¹²

For co-location at same data center, speed performance can vary significantly⁶⁸ depends on connectivity⁶⁹, kilowatts and equipment cabinet, as well as other configuration and firmware parameters⁷⁰. Some connectivity options offered by Exchanges as of today include: 1G/ 10G/ 40G/ 100G.⁷¹ However, 400G⁷² is already being offered commercially in other industry as of last year, 800G⁷³ is already achieved in late 2019 to early 2020, and the Ethernet Alliance projects 1.6Tbit⁷⁴ would become standard possibly between year 2023 and 2025. “Same manner and methods”, if **without putting the right parameters to bound performance may merely be a “standard price list”** for market data and connectivity offers by a particular Exchange.

“Microwave technology (or radio frequency, RF) allows for trade data to be transmitted faster than via connections based on fiber optic technology. Microwave can deliver lower end-to-end latency than fiber because it takes a more direct line between the two ends of the network. Also, microwave signals travel at the speed of light through air, rather than over fiber, which can attenuate signals.”⁷⁵ Depending on use cases, the race between laser communication and microwave or radio communication could get a whole lot more complicated than a straight forward de facto answer.⁷⁶ My point is: policy

⁶⁸ <https://datacenterfrontier.com/speed-colocation-providers-today/>

⁶⁹ <https://www.nature.com/articles/s41598-020-59625-9>

⁷⁰ <https://www.psychz.net/client/kb/en/learn-about-colocation-benefits-and-how-to-get-started.html>

⁷¹ https://www.nyse.com/publicdocs/data/IGN_Colo_US_Technical_Specifications.pdf

⁷² <https://www.fiercetelecom.com/telecom/at-t-fires-up-400g-optical-connection-between-dallas-and-atlanta>

⁷³ <https://www.ciena.com/insights/articles/800G-is-here-pushing-the-boundaries-of-what-your-network-can-do.html>

⁷⁴ <https://ethernetalliance.org/wp-content/uploads/2020/03/EthernetRoadmap-2020-Side1-FINAL.pdf>

⁷⁵ https://www.six-group.com/exchanges/participants/participation/connectivity/microwave_network_en.html

⁷⁶ <https://www.quora.com/Why-is-laser-communication-faster-than-microwave-or-radio-communication>



makers **blindly believe in “drag race”** competition (among CCs and with also with other constituents) over an ever faster transmittal speed using microwave⁷, laser⁸, quantum⁹ technologies, etc. would **only benefit the telecom companies**, but never solve this entrenched, unfair, and discriminatory matter.

Widening the technology **gap between the “have” and “have not”** favors the HFTs and hurt the average investors. Again, what the industry need is: shield protection for everyone and not another ultra-fast bullet to harm one another. Different Exchanges may use different time-locks¹⁴ to make market data available **securely** in synchronized time¹², but mandating the secure synchronization of **“start time”** would prevent anyone from having an **unfair advantage at the starting-line**.

in order to ensure “core data **evolves along** with the broader market ecosystem”², policy makers should **require SROs to comply with:**

A ratio between the fastest non-CCs and the slowest CCs’ connectivity NOT to exceed a 2.5 times threshold

The fastest/ highest capacity **connectivity** that SROs offer to non-CCs should NOT be faster/ have higher capacity than 2 to 3 times the slowest connectivity used by any CC. For example, if the slowest CC connectivity is at 10G, everyone else cannot have connectivity with SRO at higher than 25G. This is to **avoid a scenario where latency gap is too large or overly frequent upgrades** by SROs cause the connectivity cost, even though the fastest speed is one of the available options in the price list, to be **not affordable** by CCs and average BDs. As mentioned in #2 of [Table 1](#), the SEC’s proposal is based on 10G connectivity while NYSE launched 100G colocation service since April 2020. This 10 times difference would soon become 40, 80, or even 160 times soon.¹⁰

If a SRO intends to upgrade its fastest connectivity beyond (or already exceeded) the 2.5 times threshold, the SRO should cover the prices difference to upgrade CCs’ connectivity for FREE. Besides, the SRO should offer older model equipment for FREE or at discounted price to subsidize/ cover the cost of CCs and BDs for necessary replacements and/or upgrades. We want to emphasize that this is NOT to penalize anyone in pursuit of ever faster speed to make the market more efficient. Despite securities Exchanges registered with the SEC as self-regulatory organizations (SROs) are quasi-regulatory authorities, but SROs do not enjoy quasi-governmental immunity⁷⁷. We are not sure if the SEC can force the SROs administratively to prescribe particular fees charge for colocation services if there is no violation of anti-trust rule. We are not trying to “split”²⁸ Exchanges’ trading and data businesses, yet the SEC can always consider a worst alternative to a negotiated agreement (**WATNA**) if SROs are unwilling to cooperate.

We believe having a **mechanism to encourage social responsibilities** is a key driver to “grow the pie” and foster sustainable development of NMS. Indeed, this is similar to phone plans and mobile device offers in the telecom industry. This “2.5 times threshold” provides “trading venues with sufficient opportunity and **flexibility to innovate**”³, while “ensures that core data **evolves along with the broader market ecosystem**”².

Question 69

Should all data disseminated by the SROs to competing consolidators and self-aggregators be in the same format (e.g., aggregated vs. message-by-message depth of book)? Please explain the expected benefits and costs of allowing for multiple formats for data dissemination.

NO, “Same format” hurts average investors and gives HFTs a permanent advantage (See [Figure 3](#)). Assuming if we have market data available **securely** and the **starting line is synchronized**¹², by **altering/ differentiating data format and compression methods**, and together with some tradeoffs for what constitute as essential contents of core data, a **fair race**

⁷⁷ <https://content.next.westlaw.com/Document/I8aba78e5e4dd11e79bf099c0ee06c731/View/FullText.html>



among different players **may marginally be possible under certain conditions** (see our respond to Q68 regarding maintaining a ratio of 2.5 times connectivity speed/ capacity threshold). Besides, HFTs using high performance computers to decrypt data may still have an edge assuming same full contents of core data and same data compression method. As mentioned in #2 of [Table 1](#), the SEC’s proposal is based on 10G connectivity while NYSE launched 100G colocation service since April 2020. This 10 times difference would soon become 40, 80, or even 160 times soon.¹⁰ The purpose of requiring this 2.5 times threshold is to **avoid a scenario where latency gap is too large or overly frequent upgrades** by SROs cause the connectivity cost, even though the fastest speed is one of the available options in the price list, to be **not affordable** by CCs and average BDs.

Giving a fair chance for non-HFT to compete is **not a favor** to the ‘have not’ **but an obligation** where policy makers should strike to promote the fair and reasonable, as well as non-discriminatory principles.

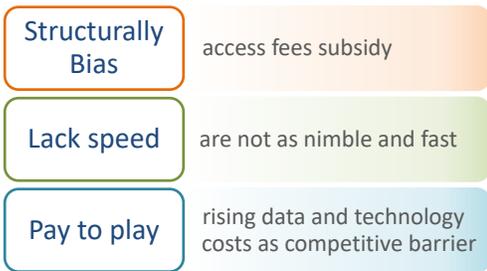
Last but not least, we believe aggregated format is good enough for our replication of the DOB curve. Yet, if Level 1 data is required, message-by-message format would be preferred. Everyone can easily pass information along “as-is”, but not anyone can come up with a creative approach that well-considered the latency fairness issue. Please see earlier part of this letter and our respond to Question 38 - Question 43 for further explanations.

Question 70

Should the SROs make historical data freely available to market participants at a specified location and in a specified format? Why or why not?

FREE available of historical data would definitely be positive for researchers and the public to discover trade patterns and generate business intelligence. It would particularly be useful for market surveillance⁷⁸ in leveraging the crowd to detect unknown unknowns, such as flash crashes⁷⁹. However, proprietary trading strategies ought to be respected and protected, so this becomes a confidentiality and privacy⁸⁰ question. Technically, there are ways to have privacy-enhanced collaborative filtering mechanism.⁸¹

Context of the Problem



- Technology does not necessarily enhance the flow of information. It can also be used for obfuscation or delay. Indeed, it depends on how it is employed by people who can obstruct development, create inequality through restricted access to information, and pursue rent-seeking behaviors.
- The argument is not only the added quantifiable costs, but also wasting economic resources and opportunities lost due to the perils of bootstrapping data, information disadvantage and non-price competition such as alleged abuses⁸². Indexing/ passive investing is like the ‘Bed of Procrustes’⁸³ – a false comfort. Avoidance of 21st century problems nourishes more bad behaviors that deter investor rights.

⁷⁸ <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD389.pdf>

⁷⁹ <https://www.reuters.com/article/us-britain-sterling-flashcrash-idUSKBN13X21N>

⁸⁰ <https://www.fdic.gov/regulations/examinations/financialprivacy/handbook/>

⁸¹ <https://pdfs.semanticscholar.org/d084/30e1c163a6114494b43fa2f0281abd71eb6e.pdf>

⁸² <https://www.cnbc.com/2018/03/23/bank-of-america-in-42-million-settlement-for-masking-trading.html>;

<https://blog.themistrading.com/2016/02/credit-suisse-and-barclays-record-settlement-with-ag-and-sec/>;

<https://www.sec.gov/litigation/admin/2016/33-10272.pdf>

⁸³ <https://www.amazon.com/Bed-Procrustes-Philosophical-Practical-Aphorisms/dp/0812982401>



Weakness - OLD

OLD Practices	Served Purpose	Shortfall
Recalibrate access fees	The pilot is an attempt to change the incentive system	Not able to deter the vested interest groups to back-off. The emergence of new Exchanges may find alternate ways to seek unfair advantages.
Fully and fairly describe proposed fees change	Strong message to warn Exchanges not to exacerbate price differences	Not able to deemphasize speed as a key to trading success. SRO's rivalry & rent-seeking behavior is like spectrum interference, the public's interests are inadvertently compromised.
Encourage competition	"attempts" to fix the market with exchanges' lead innovations	Not sustainable, exchanges imitate market designs causes inability to shift paradigm.

Advantages – NEW

Value

High value, accelerate learning and adoption

Direct

Trade like the Pros in recognizing pattern at super fast speed

Fair

Democratization of technology

These all boils down to:

Tech democratization, enable the crowd, and counter the effect of high fixed costs resulted from drag race

Our way of democratizing technologies is through a collaborative platform where users may use our patented tools to monitor trade activities under conditions (e.g. market manipulation would revoke their rights to use and face possible prosecution by the regulators). Users will be giving access to a library of "known" patterns, as well as opportunity to make money if they are able to contribute to newly discover "unknown unknowns" signals.

Because identified patterns or trends are distinctive from one's proprietary trading strategies, so we believe it would help level the playing field, enabling average investors to trade like the Pros, and advance the safety and soundness goal for our entire industry.



Compete without the Fastest Access

Question 71

Is there anything different about having competing consolidators or changing the content of consolidated market data that should affect the analysis of the fairness and reasonableness of fees for data distributed pursuant to an NMS plan, or how the NMS plan participants demonstrate the fairness and reasonableness of those fees? If so, please explain why.

Without **synchronizing** the **secure** availability of market data, no one can claim the NMS is fair and reasonable in the 21st century. Without answering the question of "**who owns the data**"²⁰, many would still complaint on fees being unfair for whatever data distributed pursuant to an NMS plan. The question should not be about "demonstrating" the fairness and reasonableness of those fees per se, but "achieving" reasonable balance to transition to a new equilibrium that would fairly determine "**Who Gets What – and Why**".⁴⁴

Taking an analogy from the U.S. Constitution about "balance of power" among government branches (i.e. the executive, legislative, and judicial), plus the implicit 4th power – the media, we come up with [Figure 1](#) below for a proposed 3-pillars model to align the interests of regulators, SROs, CCs, and the industry at large.



Securities and Exchange Commission

Assurance

3 – SEC/ FINRA

Admin CC licenses, perform annual assessment, and help remove roadblocks. If NMS reform is done right and CC deliver on its promised, then success would look like:

- Secure synch availability of market data at lower cost
- Deemphasize speed as a key to trading success
- Industry will relies less on dark pools (ATs), SORs, etc.
- Grow market participation from average investors

Execute the plan

1 – Competing Consolidators (CCs)

- Business continuity/ disaster recovery for SIP
- Expand SIP functionalities/ takeover some prop feed services to offer at more affordable price
- Innovate, promote fairness + enable average investors
- Serve as conduit to facilitate reasonable negotiation btw industry and the SROs (solve question on who owns data)
- Analytical support for CAT

Set Boundaries

2 – SROs, SIP advisory committees + Reps from industry organizations that are neither SA nor CC

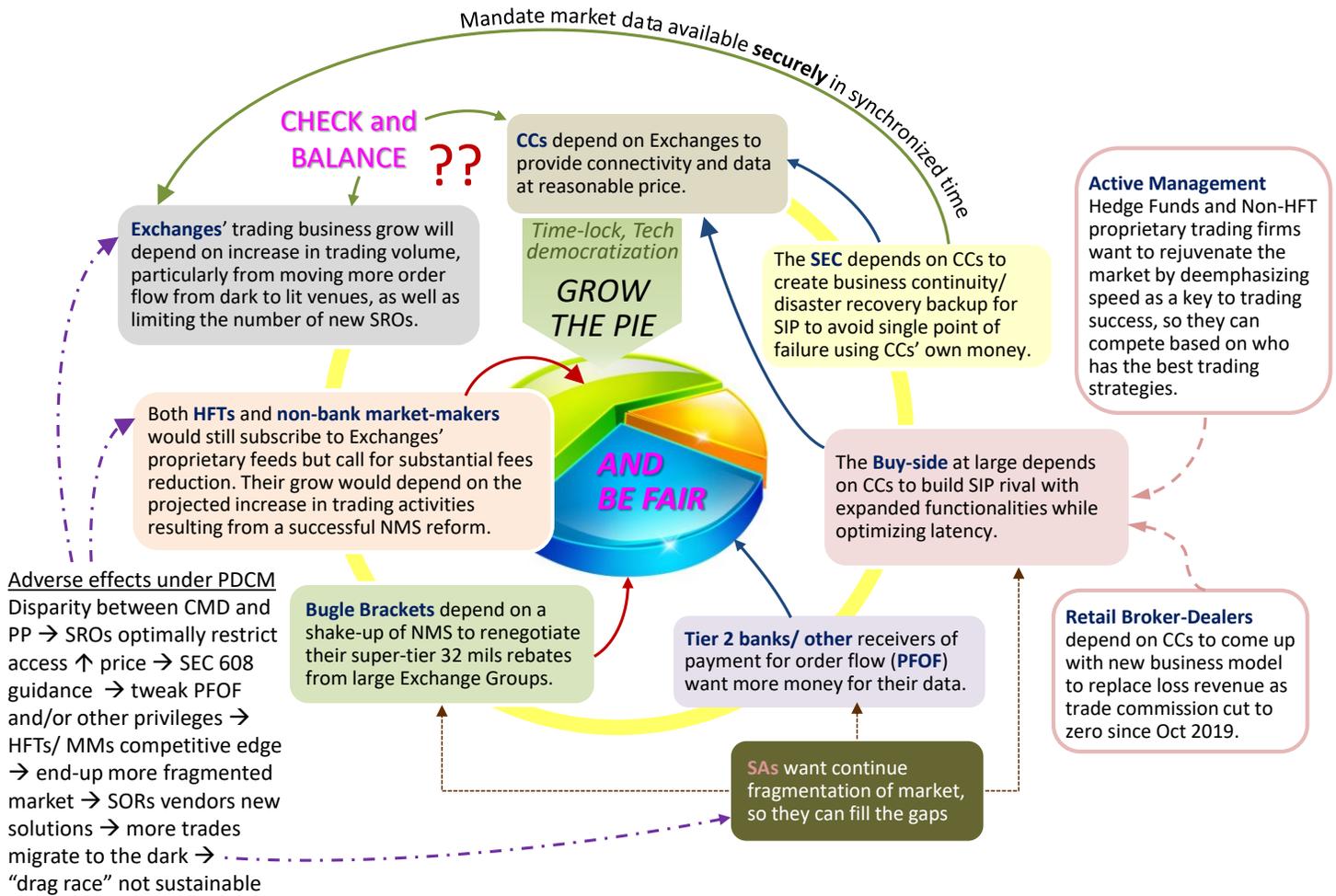
- Recommend to the SEC on data coverage, time synch granularity, and other performance boundaries that considers different tradeoffs to optimize latency and content richness
- SROs supply data covered in scope to CCs and SAs
- Direct sell non-covered data
- Remedies in case CCs fail

4 – Self-Aggregators (SAs) Grow business at the expense of market ineffectiveness and inefficiency

- the rich may be allowed to access connectivity that not reasonably affordable to average investors
- introduce benchmark reference price arbitrage due to multi-NBBOs as well as CMD and PP disparity
- new market designs/ order types to extend the payment for order flow fight and market convolution

As illustrated above, we envisage **CCs** at the center (1 – **executive branch**) for its prominent role in shaking up the market data infrastructure. CCs would carry out market data improvement vision and mission that shaped collectively by the **SROs, SIP advisory committees, and other representatives from the industry** (2 – **legislative branch**). Then, to assess and validate if NMS reform would yield the expected net positive outcomes and help remove any roadblocks when otherwise, we look up to the **SEC and FINRA** to play this assurance role (3 – **judicial branch**). We view **SAs**, including ATs, Internalizers, and SORs, as the 4th power likes the **media** in the outer circle. SAs’ business would grow at the expense of market ineffectiveness and inefficiency. Hence, there is an **inverse relationship between SAs’ performance and what success would look like in transitioning to a new equilibrium**.

In order to make the 3-pillars model works, there has to be a **shared vision**, so that various constituents would **create proper interdependency** on each other to “**grow the pie**”⁴². First, we listed out who and where different groups of stakeholders are in the “circle of influence” and who should be out of the circle because of potential conflict with the stated goals of the 3-pillars. Then, we consider what these different groups want out of this market reform, what are their strategic options, and what they will depend on in order to achieve their respective desires. [Figure 2](#) below showcased the interdependencies for various constituents and highlighted various market dynamics:



The **yellow** ring represents the "circle of influence", two things may be notice: (1) it is broken – because the SEC's proposal gives nothing for anyone to reasonably negotiate with large Exchange Groups; (2) SAs are kept outside of the circle. We are grateful for SAs filling the gaps to serve a very fragmented market in the past. SAs will still have a role going forward, they will be monitoring from the outside and take advantage whenever market reform is unsuccessful to reach it goals. Indeed, the level of market participants' reliance on SAs is indeed the best metric to keep everyone honest.

The **blue** arrows → may perceive as the positive driving force. The **red** arrows → are not necessary resistant forces, but what these groups want may be very different or contrast with the blue arrows. Given that and the question marks (??) on large Exchange Groups and MEMX willingness to cooperate with CCs, a lack of "check and balance" is what causes this circle not "unify" or broken. Without a unified circle, we are concerned if Exchanges might tweak payment for order flow (PFOF) and/or other privileges, end-up causing market to be more fragmented, more trades migrate to the dark or market shrink that is opposite to "grow the pie" objective. Hence, we need the **green** arrows → to mandate market data available **securely** in synchronized time to bring fore essential "checks and balances".

Again, "same manner and methods" if without putting the right parameters to bound performance may merely be a "standard price list" for market data and connectivity offers by a particular Exchange. Valuable market data in real-time needs proper **security protection**, different Exchanges may use different time-locks¹⁴ to make market data available **securely** in synchronized time.¹² Mandating the secure synchronization of "start time" would prevent anyone from having



an unfair advantage at the **starting-line**. Also, **TLC would eliminate latency difference due to 'extra hop' disadvantage for non-SAs**. That being said, HFTs using high performance computers to decrypt data may still have an edge assuming same full contents of core data and same data compression method. Please also see our respond to Question 69.

Question 72

Do commenters believe that the Commission should also require the SROs to provide a connectivity option solely for access to the NMS information necessary to generate proposed consolidated market data?

Even if there is no content gap hypothetically between the proposed core data and whatever proprietary feeds offer by Exchanges, SROs may continue to optimally restrict access¹⁸ (e.g. 400G vs 10G connectivity). We would love the Exchanges to provide the fastest connectivity to CCs for FREE before they can offer slower connectivity services to other market participants, but we are not sure if the SEC can force the large Exchange Groups to accept that without a fierce fight³⁷. Per our respond to Q69 and the 'condition' suggested after [Figure 3](#), the SEC should require SROs to comply with:

A ratio between the fastest non-CCs and the slowest CCs' connectivity NOT to exceed a 2.5 times threshold

The SEC's proposal is based on 10G connectivity while NYSE launched 100G colocation service since April 2020. This 10 times difference would soon become 40, 80, or even 160 times soon.¹⁰ The purpose of requiring this 2.5 times threshold is to **avoid a scenario where latency gap is too large or overly frequent upgrades** by SROs cause the connectivity cost, even though the fastest speed is one of the available options in the price list, to be **not affordable** by CCs and average BDs.

Nevertheless, it is reasonable for the SEC to ask the SROs for **security protection** over valuable market data in the 21st century. Mandating Exchanges to use TLC to make market data available securely in synchronized time does not mean they have to use particular brand of time-lock, so updating 17 CFR §242.603 would not be prescriptive. Synching the start-line is the essential step to promote the fair and reasonable, as well as non-discriminatory principles. Please see our respond to Question 71 for an elaborated discussion.

2. Competing Consolidators

(d) Proposed Definition of Competing Consolidator in Rule 600(b)

Question 73

Is a decentralized consolidation model with competing consolidators and self-aggregators a viable and/or appropriate model for the collection, consolidation, and dissemination of consolidated market data? Are there any other viable and/or appropriate alternatives?

NOT "at-is", unless 17 CFR §242.603 is updated to mandate the use of TLC, require SROs to comply with the 2.5 times connectivity speed/ capacity threshold, plus other suggestions listed out on pages 1-11 of this letter. In particular,

Collocation¹⁰ ≠ Latency Equalization (LEQ)¹¹ ≠ Market Data Available SECURELY in Synchronized Time¹²

Exchanges are powerful suppliers; the SEC's proposal gives nothing for anyone to reasonably negotiate. TLC is the **ONLY** way to get everybody the **same start-line** and **holding Exchanges accountable**. Nevertheless, our proposed "2.5 times threshold" provides "trading venues with sufficient opportunity and **flexibility to innovate**"³, while "ensures that core data **evolves along with the broader market ecosystem**"². Giving a fair chance for non-HFT to compete is not a favor to the 'have not' but an obligation where policy makers should strike to promote the fair and reasonable, as well as non-discriminatory principles.



Question 74

Do commenters believe that the definition of competing consolidator accurately captures the requisite functions necessary for collecting, consolidating, and disseminating consolidated market data? Do commenters believe that there would be sufficient interest in entities that would become competing consolidators?

The registration requirement and the proposed definition of CC under proposed Rule 6000(b)(16) of Reg. NMS is fine by us. The definition of competing consolidator is one thing, whether there is sufficient interest in entities that would become competing consolidators is another thing. Yet, **the most critical question** anyone should ask is the **effectiveness of CCs** to bring fore positive transformations in market data/ market access, and promoting the fairness and non-discriminatory goal.

Bloomberg and Refinitiv already dominated the consolidated market data field.²⁵ If any **existing market data aggregators**²⁶ can spread their fixed cost across a larger base of consumers in benefiting the industry to strike for a “fairer and non-discriminatory” outcomes, it would have succeed a long time ago. **Maximize life of aged technologies** beyond 10 years’ amortization period is in existing aggregators’ best self-interest. Existing players may buy-in to DCM because they have almost no incremental cost to become CCs. Their revenue **upside depends on** how hard the SEC and industry **beaten up the Exchanges on their behalf**. Market reform should allocate most rewards and provide a reasonable return for those who are able to innovate and contribute. **Breakthroughs require fresh innovations from someone new.**

IEX could possibly take advantage of this to become CCs and revert itself back to dark pool status. Policy makers can mandate a “split”²⁸ between Exchanges’ trading and data businesses, but should not skew/ bias its policy towards non-lit venues. Migrate more trade flow to lit venues with better transparency and grow the pie benefit average investors. The opposite is **detrimental to the Buy-side if IEX ever leave the exchange space.**

If the proposed **decentralized consolidation model (DCM) would function well, Broker-Dealers (BDs) should rely less on vendors’ services** for best execution because non-positive NBBO spread caused by locked and crossed markets²⁷ should already been eliminated. Also, Alternative Trading Systems (ATs) and Smart Order Routers (SORs) might be **better off if equity market remains fragmented**³¹ – the weaker the CC, the more opportunities to come up with new market designs/ order types that extends the current market convulsion. The SEC proposal seems bias to SAs and contradictory to the ‘new equilibrium’ that we would define as in **①**.

The SEC’s estimated costs (initial costs of \$0.6-\$3.9 million and ongoing costs of \$2-\$2.6 million) **for CC is far too low** because the consolidated **data volume** would likely be **comparable to** (though a bit smaller than) the consolidated audit trail (**CAT**) which targeted to process between 30-120 billion trade events daily or more than 29 petabytes of raw uncompressed data in 6 years. Also, building a SIP rival cost substantially more than ATS that handles only a subset of the total market volume. **Posting quotes but not matching trades is in essence limiting business scope of CCs.** Given there is also the compliance burden, such as the SCI requirements, therefore we think the proposed twelve CCs “licenses” would definitely cause **too much competition hampering survival of CCs** that rely on a viable economy of scale to post quotes.

Please see [Table 1](#), [Table 2](#), and our respond to Question 71 for an elaborated discussion.

Question 75

Do commenters believe that competing consolidators would provide the necessary competition to lower the processing time and distribution speeds for consolidated market data, as proposed to be defined, as well as reduce the overall costs of proposed consolidated market data?

Yes, for a new entrant like us. No, for others because: (1) the upside on revenues depend on how hard policy makers and the industry beaten up the Exchanges rather than anything an existing large data redistributor need to contribute (i.e.



reduce latency differential, deemphasize speed as a key to trading success, democratize technologies and reduce gaps between the ‘have’ and ‘have not’, etc.) to earn it; (2) SAs might be better off if market remains fragmented. **It is not about lower the processing time and distribution speeds, but narrowing the gap between the ‘have’ and ‘have not’.** Policy makers blindly believe in “drag race” competition over an ever faster transmittal speed using microwave⁷, laser⁸, quantum⁹ technologies, etc. would only benefit the telecom companies, but never solve this entrenched, unfair, and discriminatory matter. What the industry need is shield protection for everyone and not another ultra-fast bullet to harm one another. Again, “same manner and methods” if **without putting the right parameters to bound performance may merely be a “standard price list”** for market data and connectivity offers by a particular Exchange. Ratio between non-CCs and CCs’ connectivity must not exceed our suggested “2.5 times” threshold. Also, real-time market data is valuable and its security must be protected by using time-lock¹² to ensure no premature decryption.

CC is indeed an intermediary between suppliers and users adding a layer of cost to the overall system if it does not perform any value-added function. Taking over some of the existing functionalities of Exchanges’ PP do not count as “value-added”. Whatever positive effect from breaking up Exchanges’ monopoly is going to be short-term, while long-term sustainability is doubtful because Exchanges may exploit any disparity between consolidated market data (CMD) and proprietary products (PP), and/or the rich may be allowed to access connectivity that not reasonably affordable to average investors. As mentioned in our Dec 2019 comment¹⁵, guidance¹⁶ reminds SROs that SEC is vigilant. Yet, no further exacerbating of market data price differences has not been achieved¹⁷ and it does not ensure a fair and efficient access. “Exchanges may optimally restrict access to price information for rent seeking behaviors.”¹⁸ **PP fees will go up rather than go down because demand is inelastic.** Benefits from less expensive alternatives to PP will be offset if Exchanges exploit disparity (level 2 DOB, OTC, non-equity data, etc.) to recover loss profits to CMD. Even if there might be short-term cost drop in CMD, it will not be sustainable if trading volume stays flat. **Price may be a dismissible factor** among others to affect **BDs choice to switch** from solely using SIP to CMD (see [Table 1](#), [Table 2](#), and [Figure 2](#)).

Question 76

Do commenters believe that concerns identified by the Commission regarding the competing consolidator model considered in the Regulation NMS Proposing and Adopting Releases would be sufficiently addressed with the proposed decentralized consolidation model with competing consolidators and self-aggregators proposed in this release? If not, how should these concerns be addressed?

SEC identified concerns / suggested mitigants	Our Views
1. Uniform data distribution to the public <ul style="list-style-type: none"> • Sequencing (H/W, S/W, Comm. Platform diff.) Mandate SRO timestamps when send to CCs • Validation tolerances, standards CCs establish own standards • Capacity (delay to data recipients) Post capacity performance online + assessment • Data protocols and formats Same manner and methods ... limited in severity ... more readily adapt ...	<ul style="list-style-type: none"> • Time-granularity has to be set by the SEC/ FINRA, or else industry lacks incentive to push for the most precise standard • Aggregators with foreign tie may influence NBBO (#13 of Table 1) • Need mechanism to encourage social responsibility (2.5 times threshold and ecosystem subsidy, see suggested ‘condition’ at bottom of Page 8) • “Same format” hurts average investors and gives HFTs a permanent advantage (See Figure 3) ≠ evolves along; need in-synch + maintain ratio (see #15 of Table 1)
2. Increase costs due to multiple CCs performing tasks previously performed by a single processor develop jointly the fees ... subject to Commission oversight	CC as intermediary add layer of cost (see Q75); guidance to curb price exacerbation yet achieved ¹⁷ + not ensure a fair and efficient access. Like jointly set fees, but Who gets what - and Why (see 4)



3. Risk that fees for core data could increase because payment of every SRO's fees would be mandatory, thereby affording little room for competitive force to influence the level of fees
(no good mitigants was suggested, but simply stating that) "would reduce latency, bolster resilience ... more readily adapt to changes in technology to better fit the needs of market participants"

Sustainability of short-term effect from breaking SROs' monopoly⁴ is in doubt if trading volume stays flat. Price may be a dismissible factor among others to affect BDs choice to switch from solely using SIP to CMD. (see Q75) PP fees will go up rather than go down because demand is inelastic. Latency gap is too large or overly frequent upgrades by SROs cause the connectivity cost (even though the fastest speed is one of the available options in the price list) to be NOT affordable by CCs & average BDs (see [Table 1 + 3](#))

By the way, one SIP rival (or one set of redundant systems at remote sites) would be sufficient from BCP/DR perspective to address the so-called "single point of failure" concern. The proposed twelve CCs are significant economic resources wastage, like Exchanges' medallions not being used.

Question 77

Will the change to a proposed competing consolidator/self-aggregator model present any specific operational and/or regulatory challenges to market participants? Are the challenges evenly distributed amongst market participants or would one set of market participants bear more of any burden? If so, please describe.

We see that: (1) "same format" hurts average investors and gives HFTs a permanent advantage; (2) latency gap is too large or overly frequent upgrades by SROs cause the connectivity cost (even though the fastest speed is one of the available options in the price list) to be NOT affordable by CCs and average BDs; (3) bias toward SAs and ATs and SORs might be better off if market remains fragmented – the weaker the CC, the more opportunities to come up with new market designs/ order types that extends the current market convolution. In turn, average investor will suffer unreasonable burden if policy makers blindly believe in "drag race" competition (among CCs and with also with other constituents) over an ever faster transmittal speed would resolve this entrenched, unfair, and discriminatory matter. The industry does not need faster microwave⁷, laser⁸, quantum⁹ technologies, etc. that only benefit the telecom companies. Ratio between non-CCs and CCs' connectivity must not exceed a certain threshold (see suggested 'condition' after [Figure 3](#)). Also, real-time market data is valuable and its security must be protected by using time-lock¹² to ensure no premature decryption.

Question 78

The Commission solicits commenters' views regarding the various concerns raised by Roundtable respondents about the competing consolidator model. In particular, do commenters have any concerns about competing consolidators calculating independent NBBOs? Please explain. Do commenters have concerns about multiple versions of consolidated market data, as proposed? Please explain. If there are such concerns, please also explain how these concerns would vary from the multiple different forms of aggregation that exist today among broker-dealers either self-aggregating proprietary data feeds or utilizing vendors to do so on their behalf.

Using an analogy of a foreign currency pegged with the US dollar versus a basket of other assets, **different NBBOs calculated by CCs in silos erode the de facto status¹⁹** of SIP's NBBO that broker-dealers rely on globally, push the US market to reduce to the level of brokenness like the Europe or other markets, and impact liquidity.



(e) Proposed Rule 614

(i) Section 11A(b) of the Exchange Act

Question 79

Do commenters agree that the SIPs that wish to act as proposed competing consolidators should be required to register with the Commission? Do commenters agree that such competing consolidators should be subject to the proposed registration requirements in proposed Rule 614, rather than the registration requirements set forth in Section 11A(b) of the Exchange Act? Why or why not?

Given policy maker is not really mandating a “split”²⁸ of Exchanges’ trading and data businesses, CCs might merely be Business Process Outsourcing (BPO) vendors of SROs, hence registration may perceive as an unnecessary burden. Yet, because CCs are required to calculate NBBO, and we do not want NBBO to be interfered or influenced by CCs or market data aggregators²⁶ with ties to foreign government officials³³, hence Form CC disclosure and corresponding restrictions are needed. At a minimum, at least one CC would calculate NBBO and it has to be registered, if SIPs are going to sunset.

Question 80

Do commenters believe that the Commission should establish a registration process for competing consolidators different from the registration process in proposed Rule 614? If so, please describe. Should competing consolidator registration be subject to Commission approval and/or additional or different regulation? Why or why not? If so, please describe.

If without a registration process, then CCs can be any BPO vendors of SROs which could be many more than twelve. In fact, we do think the suggested twelve CCs structure is too much competition. Moore’s law³⁴ said processing speed double every 18-24 months. Today’s gap is already 10 times different (i.e. SEC’s proposal is based off 10G while NYSE already offer 100G). Upgrade to 400G and 800G connectivity could happen next month or within this year. In other words, **not sufficient time to reach critical mass for a large enough base of consumers** to spread the ever higher fixed cost even if the proposal was suggesting three instead of twelve CCs to divide the market. Frankly, the latest and most advanced tech development costs usually amortize in 10 years, having investments burnt out every 2 years isn’t worth it. Number of CC licenses should be limited to ensure appropriate economy of scale for CCs.

Question 81

Do commenters believe that competition and market forces would be sufficient to support the proposed registration regime for SIPs that wish to act as competing consolidators? Why or why not?

Supporting the proposed registration regime is no problem. We are more concerned about this being a “left pocket/ right pocket” situation where market data revenue is merely transferred from the Exchanges to the supersized market data aggregators and SAs. Without fresh innovation to “grow the pie” and making it fair for the average BDs and investors, CCs add another layer of cost to market if it serves no value-added function and market remains largely status quo. Market reform should allocate most rewards and provide a reasonable return for those who are able to innovate and contribute. So, please lower the entry barrier for CCs and give the new entrants a little help, so we will be able to innovate and contribute for the greater good of the ecosystem.

Question 82

Do commenters agree that the Commission should exempt SIPs that register as competing consolidators from Section 11A(b)(5) of the Exchange Act? Why or why not?



Relying on Exchanges' SRO status, SIPs can be exempted. Think about if this is formality, or would anyone really revoke/halt SIP operation and "not" the Exchange if anything goes wrong? That being said, SIPs should publish performance statistics as CCs for transparency sake.

Question 83

Do commenters believe that competition and market forces are sufficient to ensure that market participants would have access to consolidated market data as proposed? Why or why not?

The market force won't be sufficient if it is the same group of old supersized market data aggregators and SAs. New entrants should be incentivized to bring in fresh innovations to advance the market, bring in security protection over these valuable real-time market data, and solve the "who owns the data"/ "who gets what – and why" question.

(ii) Description of Proposed Rule 614

Question 84

Do commenters believe that the proposed electronic filing requirement is appropriate? Are there methods other than EDFS that would be appropriate? If so, please describe. Is EDFS an efficient system for filing proposed Form CC? Would another system be more efficient? If so, please specify and describe the rationale for using a different system.

EDFS is fine, no further comment.

Question 85

Should the Commission adopt the proposal that an initial Form CC will become effective by operation of rule without the Commission issuing an order declaring effective the initial Form CC? Do commenters believe that publishing an initial Form CC on the Commission's website, without a Commission order declaring an initial Form CC effective, would provide sufficient notice that an initial Form CC has become effective? Why or why not? Please support your arguments.

An official order would be a nice to have

Question 86

Should the Commission require the existing exclusive SIPs to file an initial Form CC before they may become competing consolidators if they decide to act as competing consolidators? Why or why not? Please support your arguments.

Please see our respond to Question 82.

Question 87

Do commenters believe that the process to declare a Form CC ineffective is appropriate? Why or why not?

If CCs serve as the de facto NBBO, yes. Otherwise, Form CC is more a formality because CCs could just be any BPO vendors of SROs. Please see our respond to Question 79.

Question 88

Do commenters believe that an SRO seeking to operate a competing consolidator would establish the competing consolidator within the SRO or in a separate affiliated entity? What do commenters believe would be the advantages and disadvantages of each form of operation? Do commenters believe that an SRO competing consolidator would have any advantages over a competing consolidator registered pursuant to proposed Rules 614(a)-(c) and proposed Form CC?



Unless policy makers ultimately decide to “split” Exchanges’ trading and data businesses to curb potential exploitation on economy of scope, otherwise “run as separate affiliated entity or not” should be at SRO’s own discretion that depend on their own judgement of different risk profiles and compliance burden for different businesses. That being said, all affiliates of SRO should properly be disclosed.

Question 89

If an SRO decides to act as a competing consolidator, should it be required to file a specific notice of its intent to operate as a competing consolidator in addition to, or in lieu of, a Form 19b-4 with the Commission? Would a Form 19b-4 filing by itself provide sufficient notice that an SRO intends to act as a competing consolidator? Please explain.

Please see our respond to Q82.

proposed Rule 614(a)(2)

Question 90

In addition to material changes to a competing consolidator’s pricing, connectivity, or products, what should be a Material Amendment?

Everything is material, but not everything is beneficial. Benchmark instead of disclosure is what counted.

Question 91

Do commenters believe that a competing consolidator should be required to file a Material Amendment within a specified time prior to implementing the change that constitutes a Material Amendment? Why or why not? Please support your arguments. Is 30 days an appropriate amount of time for a Material Amendment to be filed?

No, please see our respond to Question 90.

Question 92

Do commenters believe that a competing consolidator should be required to file an Annual Report? Why or why not? Proposed Rule 614(a)(3) would require a competing consolidator to provide notice of its cessation of operations on Form CC at least 30 business days before the date the competing consolidator ceases to operate as a competing consolidator. The notice of cessation would cause the Form CC to become ineffective on the date designated by the competing consolidator. This requirement would provide notice to the public and the Commission that the competing consolidator intends to cease operations. The Commission preliminarily believes that this notice would provide market participants with time to find and select an alternative provider of market data.

Annual report is fine, we have no objection to that because one may be interested to see if any change in ownerships.

proposed Rule 614(a)(3)

Question 93

Should the Commission require a competing consolidator to give notice that it intends to cease operations 30 business days or more before ceasing operations as a competing consolidator? If not, why not? Is 30 business days an appropriate time for providing notice of an intention to cease operations? If not, what time period would be appropriate?

30 business days seem too long, we think 15 business days seem more reasonable because every extra day is like burning money and it shouldn’t take that long for BDs to switch.



proposed Rule 614(b)

Question 94

Do commenters believe that the Commission should post on its website each effective initial Form CC, each notice of ineffectiveness of a Form CC, each Form CC Amendment, and each notice of cessation? Why or why not? Please support your arguments. Do commenters believe a competitive marketplace would provide competing consolidators with incentives to disclose sufficient information in the normal course of business? Why or why not?

We have no objection to post these forms on website. That being said, benchmark instead of disclosure is what counted.

proposed Rule 614(c)

Question 95

Do commenters believe that proposed Rule 614(c) should require each competing consolidator to provide a direct URL hyperlink to the Commission's website that contains the documents identified in proposed Rule 614(b)(2). Why or why not? Please support your arguments.

We have no problem with that.

proposed Rules 614(d)(1)-(3)

Question 96

Do these provisions reflect the main obligations of competing consolidators? Should there be any other obligations?

The so-called CCs' obligations in the proposal seem major in the minors. CCs' # 1 obligation should be: innovate to address latency differentials. Then the #2 obligation is promote fairness and non-discriminatory principles by enabling average investors. Please refer to the middle column of our suggested 3 pillars model in [Figure 1](#).

Question 97

Competing consolidators would be required to generate proposed consolidated market data, which would include the calculation of an NBBO consistent with the process outlined in the definition of NBBO in Rule 600(b)(42). Do commenters believe that the definition of NBBO would ensure the calculation of consistent NBBOs by competing consolidators?

Adding aggregated odd-lot quotes for NBBO calculation in the core data would cause unnecessary confusion. NBBO should simply base on BBO provided by Exchanges to minimize any calculation or interference/ influences by CCs. Please see our respond to Question 13.

Question 98

Do commenters believe that competing consolidators should be required to develop a consolidated market data product that contains all of the data elements provided under the proposed definition of consolidated market data? Why or why not? Could there be some competing consolidators that only offer a subset of the proposed consolidated market data? Please explain.

One of the CCs has to (as replacement/ substitute of existing SIPs), but the other don't necessary (so there will be sufficient flexibility to innovate).



proposed Rules 614(d)(4)-(d)(6)

Question 99

Do commenters believe that separate timestamps should be required as described in Rule 614(d)(4)? Are these the relevant instances for timestamps? Should any other timestamps be adopted? Should any of the proposed timestamps not be required?

We are okay with these timestamp requirements, but would not undermine the challenges to achieve it within a certain time granularity precision (± 50 ms or sub-millisecond would make a big difference) for proper trade sequencing.

- (i) upon receipt from each national securities exchange and national securities association at the exchange's or association's data center;
- (ii) upon receipt of such information at its aggregation mechanism; and
- (iii) upon dissemination of consolidated market data to customers.

Question 100

Do commenters believe that the information required to be published pursuant to proposed Rule 614(d)(5) and proposed Rule 614(d)(6) is appropriate for competing consolidators? Should any further information be published? Is any information proposed to be published unnecessary?

We are okay with the publishing requirement. That being said, benchmark instead of disclosure is what counted.

Question 101

Do commenters believe that the frequency of publication of the information required to be published pursuant to proposed Rule 614(d)(5) and proposed Rule 614(d)(6) is sufficient? Is it too onerous?

Good enough. Again, benchmark instead of disclosure is what counted.

Question 102

Do commenters believe that requiring each competing consolidator to publish the data required by proposed Rule 614(d)(5) and proposed Rule 614(d)(6) on its respective website is appropriate? Would commenters prefer that the competing consolidators instead file the data with the Commission for publication on the Commission's website?

Think about it, CCs competing on hardware components/ connectivity subscriptions that anyone can go buy and replicate is indeed substitutable or commodity product that add little to no value. You do want encourage innovations using proprietary tech that secret sauce won't be shared. So, the best way is to set out a series of benchmark tests to reflect true performance, rather than waste time on any well-articulated documents.

Question 103

Do commenters believes that any of the information required to be published on the competing consolidator's website should not be required to be made publicly available? Please explain. If so, should this information be required to be provided to subscribers? Should any information proposed to be made publicly available not be made publicly available due to competitive concerns? If so, please identify the information and provide an explanation.

Please see our respond to Question 102.



Question 104

Do commenters believe a requirement for the competing consolidators to publish historical performance data should be included in proposed Rule 614(d)(5) and proposed Rule 614(d)(6)? If yes, for what time periods should historical data be required to be published?

Wouldn't it be more interesting if CCs performance can have something like the car industry's "long-term road test"?

proposed Rules 614(d)(7) and (d)(8)

Question 105

Do commenters believe that the documents required to be kept and preserved by proposed Rule 614(d)(7) are appropriate for competing consolidators? If not, please explain. Are there any other documents that should be kept and preserved by competing consolidators?

We are fine with the documentation retention requirement.

Question 106

Do commenters believe that the recordkeeping time periods required by proposed Rule 614(d)(7) are appropriate for competing consolidators? If not, what would be more appropriate recordkeeping time periods?

The recordkeeping time periods are okay.

Question 107

Do commenters believe that proposed Rule 614(d)(8), which requires competing consolidators to provide copies of any documents required to be kept and preserved to any representative of the Commission upon request, is appropriate for competing consolidators? If not, please explain.

Okay, but when regulators will move away from paper documents? Let's embrace the modern era and use benchmark tests instead.

proposed Rules 614(a)(4)(i) and (a)(4)(ii)

19b-4 (b)(2) For purposes of Section 19(b) of the Act and this rule, a "business day" is any day other than a Saturday, Sunday, Federal holiday, a day that the Office of Personnel Management has announced that Federal agencies in the Washington, DC area are closed to the public, a day on which the Commission is subject to a Federal government shutdown or a day on which the Commission's Washington, DC office is otherwise not open for regular business..

Question 108

Do commenters believe that the definition of business day in proposed Rule 614(a)(4)(i) is appropriate? Why or why not? Would any alternative definition of business day be preferable? Please explain.

Yes. Just that this Coronavirus pandemic has taught everyone that – "office" in literal term, may not be opened.

Question 109

Do commenters believe that the standards set forth in proposed Rule 614(a)(4)(ii) regarding when a filing or publication requirement is deemed to have occurred on a particular business day are appropriate? Why or why not? Would any alternative standards be preferable? Please explain.

As long as it is reasonably published, there is no point in majoring in the minors.



(iii) Proposed New Form CC

Question 110

Are the instructions in proposed Form CC sufficiently clear? If not, identify any instructions that should be clarified, and, if possible, offer alternatives.

A quick question – when Form CC needs to be filed in order to give regulator sufficient time to review before authorizing it to operate?

Question 111

Should the Commission implement an electronic filing system for receipt of Form CC, and, if so, what particular features should be incorporated into the system? Are there any burdens associated with the electronic filing of proposed Form CC that the Commission should consider?

I assume the volume would not be a lot, so having an electronic filing system may not be justified. That being said, we are okay with that if this is what required.

Question 112

Is the requested information relating to a competing consolidator’s operational capability appropriate? If not, identify any items that are not appropriate, explain why, and, if possible, offer alternatives.

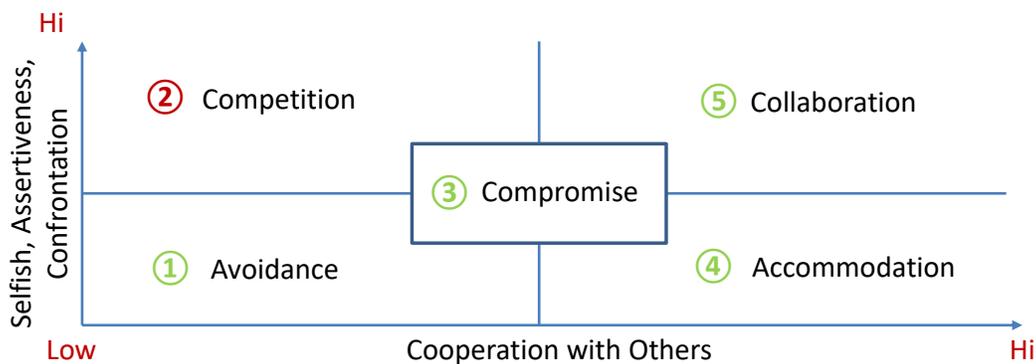
No, accessing CC capabilities should be about how a CC be able to solve a market problem, the business organization is secondary.

Question 113

Is the requested information relating to access to a competing consolidator’s services appropriate? If not, identify any items that are not appropriate, explain why, and, if possible, offer alternatives.

We are thinking those CCs using “secret sauce” to tune performance may not want to reveal “all procedures” in the “operational capability” section. Think about it, CCs competing on hardware components/ connectivity subscriptions that anyone can go buy and replicate is indeed substitutable or commodity product that add little to no value. You do want encourage innovations using proprietary tech that secret sauce won’t be shared. So, the best way is to set out a series of benchmark tests to reflect true performance, rather than waste time on any well-articulated statements on paper.

Accessing “appropriateness” of CC service should be about “conflict of interest” and see which quadrant it falls under:





Question 114

Do commenters believe that competing consolidators will bundle their products and/or services? If so, should this be disclosed on Form CC?

Bundling is likely, but would anything be prohibited? List them out now, so CCs can follow and obey rule(s) accordingly. If the Commission really meant to regulate CCs like it can only rely on 'economy of scale' but not 'economy of scope', then that may hesitate anyone from becoming CCs.

Question 115

Should the Commission require any additional information on Form CC? If so, what information and why?

NBBO should NOT be interfered or influenced by CCs or market data aggregators²⁶ with ties to foreign government officials³³, so form CC should have related disclosure and rule restrictions.

Question 116

Are there any items on proposed Form CC that the Commission should not request? If so, which items and why?

We are okay with Exhibit A and other Form CC requirements in general. However, "all procedures" in the "operational capability" section should exclude any "secret sauce"/ proprietary techniques that a CC may use to tune performance.

(f) Amendments to Regulation SCI

Question 117

Do commenters believe that Regulation SCI should apply to competing consolidators? If so, do commenters believe that the proposed revisions to Rule 1000 of Regulation SCI are appropriate? Why or why not? Is there a potential for a systems issue at a competing consolidator to have an adverse impact on the maintenance of fair and orderly markets? If so, what do commenters believe would be the most effective way to mitigate that potential?

We see SCI as "best practices" that every system builder/ administrator should voluntarily adopt, including CCs, SAs and their vendors. That being said, not all entities are required to "comply" with Reg. SCI, see Question 118 - Question 119.

Question 118

Do commenters believe that competing consolidators could play a significant role in the U.S. securities markets such that they should be defined as SCI entities? Why or why not? What do commenters believe are the risks related to subscribers associated with systems issues at a competing consolidator? What impact would a systems issue have on the trading of securities and the maintenance of fair and orderly markets? Do commenters believe that all requirements set forth in Regulation SCI should apply to competing consolidators? Why or why not?

Yes, CC in essence runs like trading venues without the trade matching part. That being said, by laying too much burden, CCs might as well become Exchanges, ATSS, or Internalizers. All trading venues face same risks about disseminating inaccurate or untimely info, which market participants rely on for valuation, investment decisions and market monitoring / surveillance purposes. Please also see Question 119.

Question 119

Unlike other types of SCI entities, ATSS are only subject to Regulation SCI if they meet certain volume thresholds set forth in the definition of "SCI ATS." Do commenters similarly believe there is a threshold size, or a threshold for significant market share, at which Regulation SCI should apply to a competing consolidator? For example, the definition of SCI ATSS



contains a two-pronged volume threshold test measured over a “four out of six-month” period to determine whether an alternative trading system is subject to Regulation SCI. Would a similar test be appropriate for competing consolidators? If so, what do commenters believe would be an appropriate measurement that should be used for such a test? For example, in the definition of SCI ATS, the NMS stock volume threshold test for inclusion of an alternative trading system in Regulation SCI is one percent (1%) or more of overall volume in NMS stocks during at least four of the preceding six calendar months. Would it, for example, be appropriate for the Commission to apply Regulation SCI to competing consolidators that had one percent (1%) or more of total subscribers of consolidated market data during at least four of the preceding six calendar months? Or, would a different threshold (such as five, ten, or twenty percent) be more appropriate? Why or why not? Please describe. Do commenters believe that another measurement (other than total subscribers of consolidated market data) be more appropriate? If so, what do commenters believe that measurement should be? Please describe.

Why “tax” on CC or ATS that being popular? On the other spectrum, require everyone to “comply” with Reg. SCI may become a barrier of entry. To strike appropriate balance, we believe large entities should lead-by-example to demonstrate compliance with SCI in showcasing proper corporate responsibilities. We recommend a 10% threshold for compliance, while encourage others below the threshold to voluntarily adopt SCI as “best practices”.

Question 120

Do commenters believe that only certain provisions of Regulation SCI should apply to competing consolidators? For example, should competing consolidators only be subject to certain aspects of Regulation SCI, such as the policies and procedures required by Rule 1001 of Regulation SCI; the requirement to provide notification of SCI events and to take corrective action as required by Rule 1002 of Regulation SCI; the requirement to conduct SCI reviews as required by Rule 1003 of Regulation SCI; the requirement to perform disaster recovery testing as required by Rule 1004 of Regulation SCI; the requirements related to recordkeeping, as required by Rule 1005 of Regulation SCI; the requirements relating to electronic filing on Form SCI pursuant to Rule 1006 of Regulation SCI; and the requirements relating to service bureaus, as required by Rule 1007 of Regulation SCI? If so, which provisions should apply? Do commenters believe that different or unique requirements should apply to the systems of competing consolidators? What should they be and why?

As long as examiners are not nip picking on “documents” or formality that favors what are “written/ articulated” by big law/ consulting firms, then we are good with the Commission requiring all provisions to truly test “Systems Compliance and Integrity” via benchmark comparison of resiliency.

Question 121

In what instances, if at all, should the systems of competing consolidators be defined as “critical SCI systems”? Please describe.

This is a question of dispensability of a CC. If the market for consolidated market data shows a near oligopoly structure, then the top firms are indispensable, hence their systems should deem “critical SCI systems”. Yet, policy makers should make every effort to avoid dominance of these supersized firms to encourage competition. **The most resilience market is indeed one that is “frictionless to switch” between vendors, rather than reliance on any “critical SCI systems”.** Therefore, the Commission may want to look into the existing data aggregators market and consider prohibiting any anti-competition or sale “lock-in” malpractices.



Question 122

Which subscribers or types of subscribers should competing consolidators consider as “designated members or participants” that should be required to participate in the annual mandatory business continuity and disaster recovery testing? Please describe.

The Commission ought to trust CCs to ask their favorite customers to help with the annual BCP/DR test rather than through a formal “designation” process. Think about it, the more prominent these participants are, the CC would more creditable respect if positive test results.

Question 123

Do commenters believe that requiring competing consolidators to be defined as SCI entities would deter parties from registering as competing consolidators? Why or why not?

Please see our respond to Question 119.

Question 124

Do commenters believe that competing consolidators should not be defined as SCI entities but should be required to comply with provisions comparable to provisions of Regulation SCI? Why or why not?

Please see our respond to Question 119.

Question 125

If commenters believe that competing consolidators should not be defined as SCI entities but should be required to comply with provisions comparable to provisions of Regulation SCI, what provisions should apply? Should competing consolidators be required to have business continuity and disaster plans, to designate subscribers that the competing consolidator determines are necessary for the maintenance of fair and orderly markets in the event of the activation of such plans, to mandate such subscribers’ participation in scheduled functional and performance testing of the operation of such plans not less than once every 12 months, and to coordinate testing of such plans on an industry- or sector-wide basis with SCI entities, or otherwise be required to participate in coordinated testing scheduled by SCI entities? Why or why not?

Please see our respond to Question 119 and Question 122.

Question 126

Do commenters believe that existing proprietary market data aggregation firms that wish to register as competing consolidators would establish separate legal entities for that purpose? Why or why not?

Yes, that is likely because of compliance burden consideration. As mentioned in our respond to Question 121, policy makers should make every effort to avoid dominance of supersized market data aggregation firms to encourage competition. **The most resilience market is indeed one that is “frictionless to switch” between vendors, rather than reliance on any “critical SCI systems”.** Therefore, the Commission may want to look into the existing data aggregators market and consider prohibiting any anti-competition or sale “lock-in” malpractices.



3. Self-Aggregators

Proposed amendment to Rule 600(b)(82)

Question 127

Is the definition of self-aggregator as “a broker or dealer that receives information with respect to quotations for and transactions in NMS stocks, including all information necessary to generate consolidated market data, and generates consolidated market data solely for internal use” too broad or narrow? Should other entities be included in the definition? Please identify such entities and explain.

The definition may be flawed. Does aggregating CMD in “public cloud” counted as “own facility”, what constitute as “standard format”, and would reselling a variated version of proposed CMD be permitted? The consolidation and dissemination method (i.e. software) for CCs and SA vendors may be the same. Given, CCs do not have say on data content fees pay to suppliers and connectivity fees charge to clients are subjected to statutory control, why throw in all the hardware, use own balance sheet to finance others’ subscription of data and connectivity, and subject itself to compliance burden if CC cannot earn a reasonable return to provide these value-added functions over SAs?! The Commission’s proposal is unfair to CCs and biased to SAs.

Question 128

Are the distinctions between self-aggregators and competing consolidators sufficiently clear? Should any additional clarification be provided to fully distinguish between a vendor that provides self-aggregation services to multiple broker-dealers and competing consolidators that provide aggregated data to multiple broker-dealers? If so, please describe what additional clarification should be provided.

Absolutely NOT, see our respond to Question 127.

Question 129

Should self-aggregators be subject to a registration requirement? Why or why not?

See our respond to Q127. SAs are significant component of the overall market. Reference to our suggested 3 Pillars Model in [Figure 1](#), we views SAs, including ATs, Internalizers⁸⁴, and SORs, as the 4th power like the media outside 3 branches of government. SAs’ business would grow at the expense of market ineffectiveness and inefficiency. Hence, there is an inverse relationship between SAs’ performance and what success would look like in transitioning to a new equilibrium. Given that, why the Commission not be vigilant against SAs or allow more relax rules on SAs than CCs?

Question 130

Self-aggregators may have a minor latency advantage over competing consolidators. Please provide comment on this potential latency advantage. Would the latency advantage be material? Are there methods to neutralize any latency advantage between self-aggregators and competing consolidators? If so, should they be instituted?

Yes, very material. Neutralize it is a cost, and SA do not bear such cost, so it is unfair to CC. The way to neutralize it is through time-lock cryptography (TLC)¹². Please see the paragraph above [Figure 3](#) for further explanation.

⁸⁴ <https://www.bis.org/publ/cgfs52.pdf>



Question 131

Should self-aggregators be permitted to disseminate proposed consolidated market data to their affiliates and subsidiaries without being required to register as a competing consolidator? Why or why not? Does the restriction on not providing consolidated market data or a subset thereof to customers or affiliates reflect a significant departure from current practices? Please explain.

Permitting SAs to disseminate proposed CMD to affiliates and subsidiaries essentially allowing them to perform CC function without the CC burden. Also, referencing to this Bloomberg case⁸⁵, Judge Caproni affirmed “Bloomberg’s claim of contract breach by UBS to use Bloomberg’s data to compete with the company itself. Since the allegations were plausibly laid out that Bloomberg’s data was made available to customers of UBS without those same customers having to be Bloomberg licensees. This would give the customers “little reason to pay for a separate subscription to receive that data directly from Bloomberg.” Besides, SAs benefit from continue fragmentation of the market, which is opposite to what success would look like in transitioning to a new equilibrium (see ①). Therefore, the Commission not be vigilant against SAs or NOT allow more relax rules on SAs than CCs.

Question 132

Should any market participants aside from broker-dealers be included in the proposed definition of self-aggregator? Please explain.

Depends on how the Commission would clarify the questions we raised about the definition of SAs, data aggregation vendor that are not broker-dealers may or may not be within scope of SAs, in order to properly interests of CCs while striking appropriate balance to respect the commercial autonomy of private vendor business.

4. Amendment to the Effective National Market System Plan(s) for NMS Stocks

Proposed Rule 614(e)

Question 133

Do the proposed amendments to the effective national market system plan(s) for NMS stocks reflect an appropriate role for the NMS plan(s) under the proposed decentralized consolidation model?

NO, it discharged SROs’ responsibilities, while **Collocation¹⁰ ≠ Latency Equalization (LEQ)¹¹ ≠ Market Data Available SECURELY in Synchronized Time¹²**. CCs face competition and burden to build expanded SIPs, including using CCs’ own money to create business continuity/ disaster recovery backup for SIP to avoid single point of failure. It is biased toward favoring SAs that benefit from continue market fragmentation. Please see ③ and ④ for our counter suggestions.

Question 134

Should the rule include other provisions that should be included in an amendment to the effective national market system plan(s) for NMS stocks? Please describe.

Yes, real-time market data is highly valuable and it needs proper Security Protection. 17 CFR §242.603(a) interpretation is incomplete and requires clarification or appropriate updates, we strongly urge the SEC to consider mandating “market data available **securely** in synchronized time”¹².

⁸⁵ <https://finance.yahoo.com/news/judge-allows-bloomberg-breach-contract-112521385.html>;
<https://www.courtlistener.com/docket/7422847/bloomberg-finance-lp-v-ubs-ag/>



Question 135

Should the rule require an amendment to the effective national market system plan(s) for NMS stocks to include plan provisions related to the development by competing consolidators of non-core market data products (i.e., a full depth of book product)? Why or why not?

We want to remind that “No fish can survive when the water is too clear”, please see our respond to Q38-Q43 regarding a 3rd option for DOB curve replication. That being said, it will be most beneficial if CCs can have the full DOB information in supporting of the CAT project. It’s up to what the SEC, FINRA, and the industry will ultimately decide, we’ll be flexible to accommodate.

Question 136

Should the rule require an amendment to the effective national market system plan(s) to require the operating committee of such plan(s) to develop latency statistics based on the SRO timestamps and make them publicly available?

Yes. Per our earlier comment in page 10 of (4), we hope SROs will be so kind to FREELY give out pattern of historical market manipulation or crash events data to the public and academia. For us, we would love the opportunity to work with large retail/ online BDs to offer our patented inventions, so average investors will be equipped to trade like the Pros, to do pattern recognition, be able to compete without the fastest access.

Also, please see our respond to Q2, we suggest a “delayed” odd-lot trades and quotations statistics, so that experienced market participants may use reverse-engineering methods to “figure-out” or “project” how these odd-lots would play out in sequence. Providing too much information is going to drag the processing time of SIP and CC from a technical perspective.

Question 137

Do commenters believe that the proposed timestamps are sufficiently comprehensive? Should the Commission require other timestamps to be added by the SROs, or should any of the proposed requirements for the timestamps be pared down or removed? Please explain.

Good enough. That being said, as mentioned in our respond to Question 99, we would not undermine the challenges to achieve it within a certain time granularity precision for proper trade sequencing. Time-granularity³² has to be set by the SEC/ FINRA, or else industry lacks incentive to push for the most precise standard (± 50 ms or sub-millisecond would make a big difference).

Question 138

Should the rule require an amendment to the effective national market system plan(s) for NMS stocks to specify a method for synchronizing clocks on the various systems and networks utilized in the provision of proposed consolidated market data? If yes, what is the appropriate method or protocol (e.g., Precision Time Protocol vs. Network Time Protocol)? Or should the requirement for clock synchronization be performance based (i.e., accurate to less than one microsecond)? If so, what is the appropriate standard for maximum allowable clock drift? Please explain. Should the SROs be required to publish clock drift statistics?

Yes, but first it has to decide which atomic clock (e.g. NIST or US Navy observatory) to use. We would assume the NIST⁸⁶ would be the preferred choice, given NIST is currently the basis for CAT project. Next, there could be many out-of-synch causes. We are not aware of any current guidance by the SEC that requires firms to adjust business clocks for leap seconds

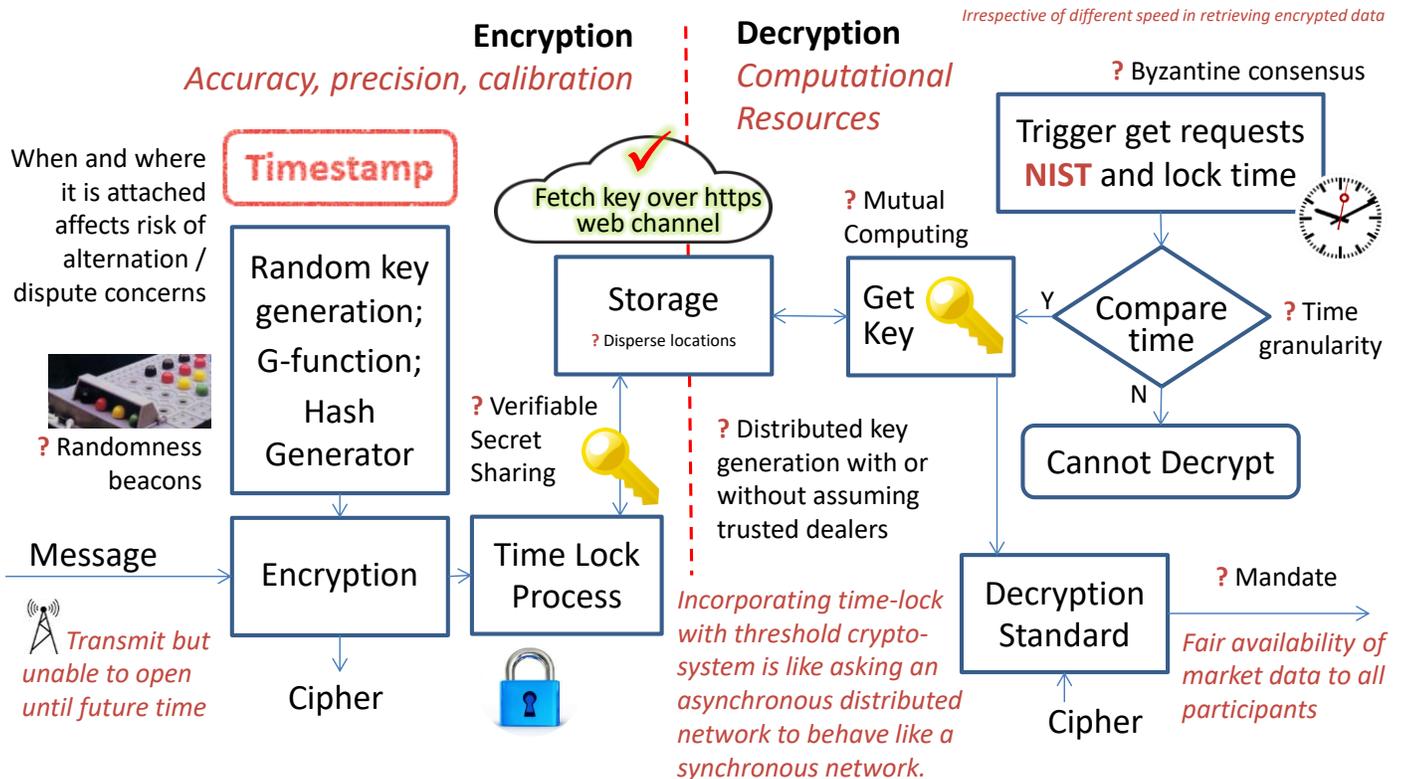
⁸⁶ <https://www.nist.gov/news-events/news/2018/11/nist-atomic-clocks-now-keep-time-well-enough-improvemodels-earth>



cumulative differences. Other out-of-synch causes include non-reciprocity of the paths of the NTP packets. Given the capital markets commonly use sophisticated routing algorithms to control the lag of the packet at the router and the next leg of the route, the delay can differ significantly, and I foresee challenges for SEC analysts to cater for all these routing nuances proliferated by Reg. NMS. On top of that, there also is unknown traffic congestion, such as Ethernet link availability during severe conditions (e.g., cyberattack, power outage, etc.). Therefore, it will be hard for the SEC/plan processor to strictly enforce clock synch requirements under such circumstances. Given the above, how strict regulatory enforcement should be is a challenging question to answer.

Clock synch is huge issue because the usefulness of data depends on the ability to sequence trade activities on a play-by-play basis Using one of the flaws about CAT as an illustrating example: If one SRO or CC is 50 milliseconds faster, while another one is 50 milliseconds slower than NIST and/or the exchange's server, a lot can happen (including unfair advantages) in the 100 milliseconds total time difference. Therefore, although 50-millisecond maximum divergence is attainable but setting the bar too low would not be useful for many.

There is a significant cost just to upgrade Network Time Protocol (NTP) servers to Global Positioning System (GPS) time source better clock accuracy. Pushing for extreme clock synch precision at ten microseconds or less performance would exponentially jet up cost; end-up someone in the industry has to pay for it. That being said, SROs should hold themselves to a higher standard than today. For that, rather than continuous arguments over imprecision of time by different parties, we recommend the industry to consider the use of time-lock cryptography (TLC) to make market data available securely in synchronized time. Following is the high-level protocol we suggest:



The above design may be tweaked differently with various Pros and Cons, including but not limited to the followings:



- Incorporate time-lock with threshold-cryptosystem is like asking asynchronous distributed network to behave like synchronous network.
- Consistency of server's notion of time depends on joint attestation by clients that subjected to certain tolerance level.
- Data may be vulnerable to alteration if timestamp attached to file before encryption.
- Threshold secret sharing the identity based encryption master key among the group avoid single point of failure, but time granularity of consensus architecture may not fit the use case to solve the market data / market access problem.
- Assume no corrupt nodes as a result of deliberately set clocks arbitrarily forward or back, network condition can affect the precision of when the time vault beacon released key to allow decryption of message.
- TLC is on logical time, not real time per se. Witness consigning need to pick an arbitrary before and after tolerance window, which is hard to calibrate. Attempt to correct monotonicity violation may introduce other nuances.
- Asynchronous distributed network may be less expensive, but slow.

Given the above pros and cons, the design of TLC can vary depending on accuracy and precision requirements, preferred approach to calibrate nuances, and the amount of computational resources to decrypt the data. Because we do not want to push the bottleneck to an arms-race of using high-performing computers to decrypt data, therefore, computational resources and the type of data contents must also be considered in the design of a reliable encryption scheme. Please see [Figure 3](#) for further explanations.

Question 139

Do commenters believe that there are other measures to assess the performance of competing consolidators that should be included in the annual report? Please explain.

Information from both the industry and academia⁸⁷ on market data costs and measuring aggregators' performance are overwhelming. Yet, we have very different perspectives, for example, from IEX versus NASDAQ. That being said, we think the best assessment of CC should NOT be reviewing particular CC's performance in silo, but looking at its competition. The competitions can be direct rivalries among market data aggregators, which Greenwich, Burton Taylor, and other research companies have regularly conducted benchmark studies (see Question 174). Yet, the competition we refer here is indeed about who would benefit the most when CCs failed. As mentioned in [Figure 1](#), we have stated what CC ought to deliver under "1" or the middle column. What success would look like is listed under "3". We think SAs' business would grow at the expense of market ineffectiveness and inefficiency. Therefore, one may use the inverse relationship between SAs' performance and what success would look like to gauge if the overall CCs are doing a good job to foster this market reform. Bottom line is – don't trouble the CCs with a bunch of useless metrics. If you really want to see whether a CC is doing a good job, check if their competitors are being unhappy or struggled.

Question 140

Do commenters believe that a portion of the assessment or the full assessment should be made public? Do commenters believe that a portion of the annual report or the full annual report to the Commission should be made public? Why or why not? Please explain.

⁸⁷ www.sifma.org/wp-content/uploads/2019/01/Expand-and-SIFMA-AnAnalysis-of-Market-Data-Fees-08-2018.pdf; iextrading.com/docs/The%20Cost%20of%20Exchange%20Services.pdf ; nasdaq.com/docs/Market_Data_Policy_Statement_tcm5044-65695.pdf ; <https://www.copenhageneconomics.com/dyn/resources/Publication/publicationPDF/6/466/1543587169/pricing-of-market-data.pdf>; https://stacresearch.com/sites/default/files/d5root/STAC-T1_Backgrounder.pdf



One page executive summary is sufficient. How CC beat their competition among peers, and the overall industry rely less on Exchanges' PP and SAs' services are the best key performance indicators (KPIs).

Question 141

Do commenters believe that the operating committee for the effective national market system plan(s) for NMS stocks should conduct an assessment and provide the Commission with a report more frequently than annually, or at all? Please describe any alternative frequency and the rationale.

Annual assessment is good enough, or else CC won't be effective in managing its business. CCs ought to be long-term focus to research on new tech innovations for the next 5-10 years. Don't distract them with frequent requests from operating committee. Results will be seen through objective tests, BCP/ DR assessment, as well as cost savings for the overall industry when BDs can rely less on Exchanges' PP and SAs' services.

Question 142

Do commenters believe that a similar report should be generated for self-aggregators? If so, please explain. Should self-aggregators be required to publish any performance statistics publicly or to the Commission?

SAs essentially compete with CCs and benefit from continue market fragmentation (see our respond to Question 127 - Question 132). So, the Commission may want to be vigilant against SAs.

Question 143

Do commenters believe that the effective national market system plan(s) for NMS stocks should be amended to include a list that identifies the primary listing exchange for each NMS stock? Please explain. Are there alternative ways to ensure that the primary listing exchange for each NMS stock is clearly identified? Please explain.

In view of SWIFT Bangladesh Bank Heist⁸⁸ or other cyber threats that attempts to comprise data integrity, it is better to be to have a literal "identifier" of who is the primary listing exchange for each NMS stock. It also saves the hassle of frequent updates whenever there might be changes.

Question 144

Do commenters believe that the effective national market system plan(s) for NMS stocks should include fees for different types of proposed consolidated market data products, such as products that contain only a subset of proposed core data elements (e.g., a TOB product)? If so, what products should be included?

Unless regulators can point out where there might be potential exploitation of economy of scope, or other risk concerns (e.g. pay to play), otherwise why interfere with how fees for different types of proposed consolidated market data products should be set? Over regulation on pricing defeat the purpose of competing CCs.

5. Effects on the National Market System Plan Governing the Consolidated Audit Trail

Question 145

Do commenters believe that CAT should receive consolidated market data from one competing consolidator, all competing consolidators, or some specific subset of competing consolidators? Please explain.

Instead of "receive" data from CCs, CAT should access directly to SROs' or CCs' real-time analytical platform (RTAP) to conduct analysis and monitor trade activities in real-time. CAT's "T+5 Regulatory Access" is too late in our opinion⁸⁹.

⁸⁸ <https://www.pymnts.com/news/security-and-risk/2019/swift-bangladesh-bank-cyber-fraud-transaction/>



Question 146

Do commenters believe the selection by the CAT of a competing consolidator could have a competitive impact on other competing consolidators? Please explain.

Unless the SEC/ FINRA already have one of the large market data aggregators in mind and concerned if there might be possible accusation of unfairness, otherwise CAT supposes to get all SROs' data directly rather than through a CC. This and the previous question are odd. If SROs want a CC to be their agent to submit data to CAT, then the CC becomes a vendor of SROs convoluting the suppliers-customers relationship or one could operate in a subsidizing model. So sad that the CAT project is still muddling-through data issues, rather than switching gear to focus on the analytics. In our opinion, golden source of data may never be achieved or the market dynamics already change by someone claims they "perfected" the data. So let accept the data as what it is and devote more efforts into analysis. Our patent address the IOSCO⁹⁰ / Flash Crash⁹¹ challenges, and we suggest leveraging the crowd to discover unknown unknowns (see ④).

6. Transition Period

Question 147

What period of time should be expected for SROs to make any changes necessary to provide the data necessary to generate proposed consolidated market data to competing consolidators and self-aggregators?

We would expect as quickly as 30 days for an existing market data aggregator.

Question 148

What period of time should be expected for broker-dealers to make any changes necessary, including testing, to utilize the new data feeds in a manner that is not disruptive to their trading practices and their ability to meet their regulatory obligations?

It would range from 3 to 9 months in our opinion.

Question 149

What other factors should be taken into consideration to allow for a smooth transition from a centralized, exclusive SIP model to a competitive, decentralized consolidation model?

We suggest the Commission to consider the followings:

- Allow CCs to direct "cloning" of existing SIP right from the get go free of charge (inventory list, including source codes, ... ready for CCs to procure the same or better)
- Grant CCs board seats at SROs
- Mandate SROs to setup PMO with dedicated resources that matrix reporting to CCs
- Setup key performance metrics for the project
- Direct communicate with the SEC on progress, Block out lobbyists' noise
- UX – user participate in design and Put together a Public Relationships (PR) plan with the BDs communities
- Agree on Navy observatory clock versus NIST atomic clock, and other standards ...
- Solve the money question and make it economically viable for CCs (see ② and ③)

⁸⁹ https://www.databoiler.com/index_htm_files/DataBoiler%20CAT613%20Comments.pdf

⁹⁰ <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD389.pdf>

⁹¹ <https://www.fnlonon.com/articles/investment-banks-not-hfts-fuel-flash-crashes-fca-research-20170803>



Question 150

What should the Commission take into consideration in determining whether the availability of proposed consolidated market data from competing consolidators, or any other aspect of the development or implementation of the proposed decentralized consolidation model, is sufficient to allow for the cessation of the existing exclusive SIPs?

Fully tested, ethical hacking, parallel run alongside SIPs for 3 months and during which there will be BCP/DR trial runs of CCs serving as backup recovery for SIPs with satisfactory results, etc. After all, if SROs is already thinking of abandoning SIPs and plan to serve only as suppliers to CCs, then that's a symptom for the proposed DCM being commercially unattractive, concerning if there'll ultimately be sufficient competitive force to deliver its desired results.

Question 151

Should the Commission require the operation of a certain number of competing consolidators before allowing the exclusive SIPs to cease operations? Why or why not? If so, how many competing consolidators should be operational before allowing exclusive SIPs to cease operations? Please explain.

6-9 months after the first competing consolidator is up and running because you got to give BDs sufficient time to switch, while this can't be too long or else the closing SIP would be a dragging cost for the Exchange.

Question 152

How long do commenters think such an implementation period should be? Please explain your answer.

Varies significantly between large existing market data aggregators versus new entrants, or it'll be very fast if an Exchange become CC. Though many market participants wanted the transition be done overnight, but 18-24 months seem more reasonable in our opinion.

C. Alternatives to the Centralized Consolidation Model

1. Distributed SIP Alternative

Question 153

Is the distributed SIP alternative a viable or superior alternative to the proposed competing consolidator and self-aggregator model? If so, please describe the benefits of the distributed SIP model and why that model is the preferred alternative.

Distributed SIP does not solve the latency issue. The SEC should update 17 CFR §242.603 for a synch start-line, eliminate latency difference due to 'extra hop' for non-SAs, as well as require SROs to maintain a connectivity disparity ratio to ensures CMD evolves along with the ecosystem (see ③, ④, ⑤).

2. Single SIP Alternative

Question 154

Is the single exclusive SIP alternative a viable alternative to addressing the concerns with the current centralized consolidation model? If so, please describe the operation of the single exclusive SIP alternative and how it would address the latency and cost concerns arising from the centralized consolidation model. Are there any other viable alternatives?

Single exclusive SIP could be a viable alternative to addressing concerns with the current Centralized Consolidation Model (CCM) and be better than the proposed Decentralized Consolidation Model (DCM). We envisage the **operation** would include the updating 17 CFR §242.603 to **mandate use of time-lock** to make market data available securely in



synchronized time¹², and require SROs to **maintain a connectivity disparity ratio** (see ‘condition’ after [Figure 3](#)) to ensure consolidated market data evolves along with the ecosystem. It has better timeliness than current CCM and the Commission proposed DCM.

In terms of efficiency, it will definitely be less disruptive than the Commission’s proposed competing DCM because:

- (1) no switching cost for BDs, minimal transition period;
- (2) substantially less to almost no Rule modifications as compared to the Commission proposed DCM;
- (3) no economic wastage due to twelve CCs performing tasks previously performed by a single processor;
- (4) high certainty of outcomes and savings from potential litigation fights with the Exchange;
- (5) quick to roll out, uniform data distribution to the public,
- (6) improve sequencing of information and de facto NBBO for everyone to continue rely on;
- (7) replace ‘drag race’ that only benefit telecom with competition on best trade strategies via techs democratization.

There will be expanded contents if the industry shall desire, while noting that the more contents require, the narrower the connectivity ratio below 2.5 times will be in order to ensure core data evolve along with the ecosystem in a fair and non-discriminatory way. In terms of pricing, the same 3 sets of fees structure per the DCM proposal can be adopted.

Regarding cost effectiveness, including the plateauing of cost reduction (due to the clouts or near monopoly power of large Exchange Groups over market data), and the fairness issue (including the access fee rebate controversy), we do have the following suggestion regardless of Single SIP Alternative or a modified version of the Commission’s proposed DCM:

If the SEC can hold the SROs accountable by mandating the use of Time-Lock Cryptography (TLC), we are willing to dedicate our **patent** regarding the use of TLC to represent the interest of the industry to try strike a reasonable commercial deal to peacefully negotiate with the large Exchange Groups. **If Exchanges are commanding premium over what is reasonable price for market data subscriptions and connectivity, and/or being unfair on access fees, we will equalize that and make appropriate rebates back to the industry** on terms to be discussed and mutually agreed by all parties. It would be our honor if our patented tools can serve as a conduit/ utility model to facilitate a fair agreement to resolve the “Who owns the data”²⁰ / “Who gets what – and why”⁴⁴ question.

In case the Exchanges are unwilling to cooperate, the SEC can always consider a worst alternative to a negotiated agreement (WATNA) to mandate a “split”²⁸ of Exchanges’ trading business with their data businesses to curb potential exploitations of economy of scope.

Question 155

Do commenters believe that the single centralized exclusive SIP model could be a viable solution despite the fact that it would not introduce competitive forces into the provision of consolidated data and would not address geographic latency? If so, please describe any factors that make this solution as good as or better than the proposed decentralized model.

Yes, please see our respond to Question 154.



V. Paperwork Reduction Act - Pursuant to 44 U.S.C. 3506(c)(2)(B)

Question 156

Evaluate whether the proposed collections of information are necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility;

Not perfect but acceptable, see (iii) Proposed New Form CC

Question 157

Evaluate the accuracy of our estimates of the burden of the proposed collection of information;

The estimates seem okay.

Question 158

Determine whether there are ways to enhance the quality, utility, and clarity of the information to be collected;

See our counter suggestions in (iii) Proposed New Form CC and particularly our respond to Question 139

Question 159

Evaluate whether there are ways to minimize the burden of collection of information on those who are to respond, including through the use of automated collection techniques or other forms of information technology; and

See our respond to Question 102, Question 107, and Question 113

Question 160

Evaluate whether the proposed amendments would have any effects on any other collection of information not previously identified in this section.

Because of multiple Rules amendments and relative uncertainty of outcomes if compares to our proposed Single SIP Alternative, therefore additional information may require to be collected in order to fine tune the proposed DCM after implementation. Overall, we think the collected information are reasonable.



VI. Economic Analysis

B. Baseline

Question 161

Do you agree with the Commission’s assessment of the market failures and the need for regulation to solve market data problems? Why or why not? Do additional market failures exist that are not described in this release? If so, what are they? Please explain in detail.

Yes, the assessed market failure is a fact. Speed and content differentials between the market data feeds provided by the SIPs and the proprietary products sold by the exchanges resulting in:

- rent-seeking behaviors
- unhealthy competition for the fastest access
- impact to trade execution quality, and economic disincentive for non-HFT firms to maintain their trade activities

It is broken and it needed to be fixed now. This has long been a problem since time of former SEC Chair White, which she said “whether trading venues have sufficient opportunity and flexibility to innovate successfully with initiatives that seek to deemphasize speed as a key to trading success...”³ We are so thankful that our current SEC Chair Clayton is so willing to advance our industry and uphold the fairness and non-discriminatory principles. We applaud him for his vision about “ensure that core data evolves along with the broader market ecosystem”².

Question 162

Do you agree that some market participants are unable to rely solely on SIP data to trade competitively in today’s markets? Why or why not? Please explain in detail. If so, what businesses rely on the purchase of proprietary market data? The Commission is also seeking information on the number, type and sizes of market participants that purchase proprietary market data products either directly from exchanges for self-aggregation or through market data aggregators. The Commission requests that commenters provide such information where available.

Yes, we agree with the SEC Director Redfearn, whom he summarized the industry needs in his 2019 statement², including “

Speed:

*SIPs is measurably slower than proprietary data feeds. The causes for this less timely data may include communications protocols, aggregation times, and geographical latencies associated with single point of consolidation. Regardless of the causes, concerns about **latency differentials between the SIPs and the direct feeds are meaningful enough** that staff will consider whether to recommend changes to ensure that core data is timely by today’s standards.*

Depth:

*Brokers need to see depth-of-book quotes to handle the large orders of institutional investors. Market imbalance information is relevant past the top-of-book displayed quotes. During the early 2000s, when the markets converted to decimal trading, the extent of liquidity provided by top-of-book quotes in core data dropped significantly. This would likely also be the case if there was any potential reduction to the round lot size for higher priced stocks. As a result, staff will re-examine whether **core data should be expanded to include liquidity beyond the top of each market’s order book.***

Fair and Efficient Access:

*To what extent has the cost of timely access to competitive data and access **affected the goal of fair and efficient access** to markets at all venues, including the larger protected venues?”*



Question 163

Do you agree that exchanges are disincentivized from making improvements to the content or latency of SIP data? Why or why not? Please explain in detail.

As for-profit Exchanges, we see that as rational commercial behaviors. However there ought to be corporate social responsibilities to better consider the public needs.

Question 164

Does the Economic Analysis contain all relevant baseline information? If not, what else should the baseline contain? Please explain in detail.

Baseline information was collected since 2018 or earlier, we couldn't thank enough of the SEC trading and market division as well as other supporting teams for what they have already done a tremendous job.

Question 165

How competitive is the selection process for the exclusive SIPs? How does the selection process affect the performance of the SIP? How does past performance factor into the selection process? Please explain in detail.

We have faith that the latest regulatory order³⁶ directing the equity exchanges and FINRA to improve governance of market data plans would significantly improve the selection process for the exclusive SIPs.

Question 166

The Commission is seeking information on the number of market participants that rely solely on SIP data for their trading needs, and, separately, on the number of market participants that do not rely solely on SIP data for their trading needs. The Commission requests that commenters provide such information where available.

This article hopefully provide some insights: <https://flextrade.com/consolidated-market-data-feeds-surpassing-sip-in-trading/> but unfortunately no specific statistics is publicly available. Maybe the SEC should mandate the SROs to provide some transparency here.

Question 167

The Commission is seeking information on the consequences (both positive and negative) of the limited amount of odd-lot quotation information currently included in SIP data. Please be specific about exact odd-lot quotation information that results in these consequences and provide data analysis where possible. Do the consequences vary across stocks and/or exchanges? Please explain and provide data analysis where possible.

Healthy Markets Association already shared their odd-lots study⁹² with the SEC and exchanges, and we believe their information is accurate and trustworthy.

Question 168

The Commission is seeking information on the consequences (both positive and negative) of the lack of depth of book information currently included in SIP data. Please be specific about exact depth of book information that results in these consequences and provide data analysis where possible. Do the consequences vary across stocks and/or exchanges? Please explain and provide data analysis where possible.

SIFMA⁹³ challenges Exchanges' fees for depth-of-book market data has its merits.

⁹² https://www.theice.com/publicdocs/Healthy_Markets_odd_lot_comment_letter_10.30.19.pdf



Question 169

The Commission is seeking information on the consequences (both positive and negative) of the lack of auction-related information currently included in SIP data. Please be specific about exact auction-related information that results in these consequences and provide data analysis where possible. Do the consequences vary across stocks and/or exchanges? Please explain and provide data analysis where possible.

Healthy Markets Association voiced the need of auction information⁹⁴ since 2018 if not earlier. We think auction information is a controversial matter. Auction volume is substantial while related market impact is significant. Calibrating market impact in open and close auctions⁵⁵ typically requires specialists’ skills rather than easily comprehend by average investors. Some claimed, “Passive investing juggernaut is forcing investors to pile into crowded auction time – risking market stability”.⁵⁶ We recognized that the SEC, FINRA, SROs and institutional traders might be interested to research on HFT competition and liquidity on batch auction markets versus continuous-time trading.⁵⁷ We also cannot rule out certain retail investors might be interested and have a potential positive impact on auction price discovery process.

Question 170

The Commission requests comment on the scope and content of exchange proprietary data feeds. Are the proprietary data offerings similar across exchanges? Please explain in detail.

This question would be best answered by the Exchanges themselves.

Question 171

What are the consequences of the differences in latency between the SIP and proprietary feeds? Please explain in detail.

- rent-seeking behaviors
- unhealthy competition for the fastest access
- impact to trade execution quality, and economic disincentive for non-HFT firms to maintain their trade activities

OLD Practices	Served Purpose	Shortfall
17 CFR §242.603(a) interpretation	Transmitting or releasing data no sooner than to a Network processor (SIP)	70 FR 37567 and Order 67857 are Not equivalent to secured delivery (in-motion and at rest) and retrieval of data in a timely manner
Guidance on SRO rule filings relating to Fees	Strong message to tell SROs that the SEC is watching market data price increases	No further exacerbating of market data price differences does Not ensure a fair and efficient access
Bring competition to centralized processor infrastructure	Accelerate the dissemination of core data at possibly lower cost	Not working, multiple NBBOs would confuse and further convolute the market; it won’t curb rent-seeking behaviors, nor promote fairness

⁹³ <https://www.sec.gov/litigation/opinions/2018/34-84432.pdf>

⁹⁴ <https://www.sec.gov/comments/4-729/4729-4554022-176182.pdf>



Question 172

The Commission requests comment on the comparison of SIP versus proprietary data access experiences and costs. How do the types of fees and discount programs compare? Do the exclusive SIPs offer services that target the same clients as the exchanges do? Please explain in detail. Do exclusive SIPs offer services that target the same clients as third-party aggregators? Please explain in detail.

The types of fees and discount programs are very different per Tabb Group's analysis.⁹⁵ Although target clients may be different also, but ultimately HFTs interact with substantial retail order flows and trades from pension funds, ETFs, etc. Many non-HFT hedge funds or proprietary trading firms suffered from a market that over emphasized on speed as a key to trading success. The super tier 32 mils rebate is limited to elite group of Exchanges' favorite customers, causing many on the Buy-side to complaint. It is like Animal Farm²⁰, some are more equal than others.

Question 173

The Commission is seeking information on specific revenues and expenses associated with processing and disseminating market data by market data aggregators. The Commission requests that commenters provide such information where available.

IEX has already shared its cost and revenue comparison, and it is available at: [http://www.iextrading.com/docs/The Cost of Exchange Services.pdf](http://www.iextrading.com/docs/The_Cost_of_Exchange_Services.pdf)

Question 174

The Commission is seeking information on pricing of market data aggregators' data and the breakdown of such product prices between the direct data fee charged by the exchanges and the fees charged by market data aggregators for their services. The Commission requests that commenters provide such information where available.

Greenwich research: <https://www.greenwich.com/printpdf/122611>; <https://www.greenwich.com/market-structure-technology/consolidated-market-data-feeds-thrive-despite-rising-data-fees>

Burton Taylor: <https://secureservercdn.net/198.71.233.107/7jz.343.myftpupload.com/wp-content/uploads/2020/04/Information-Kit-B-T-Global-Market-Data-Analysis-5-Year-Competitor-Segment-Product-User-Institution-Analysis-2020.pdf>; <https://burton-taylor.com/wp-content/uploads/2020/01/B-T-U-S-Exchange-Information-Services-2020-Information-Kit.pdf>

Market Data Guru: <https://www.marketdata.guru/wp-content/uploads/2018/05/Global-Top-Financial-Information-Providers-Who-Why-Future-Trends-2018-05-14.pdf>

Question 175

Do you agree with the Commission's competition baseline? Why or why not? Please explain in detail.

We have no objection with the Commission's competition baseline and that has been clear with market largely in consensus.

Question 176

Do you agree that the exclusive SIPs have market power? Why or why not? Please explain in detail.

If it has no market power, it wouldn't be generating any revenue. Just that, its power may not be comparable to PP.

⁹⁵ <https://www.sec.gov/comments/4-729/4729-4559257-176198.pdf>



Question 177

Do you agree with the Commission's assessment of the state of competition in the market for core and aggregated market data products in the equities market? Why or why not? Please explain in detail. What is the magnitude of this market? What are the total expenses incurred by broker-dealers on market data products? What are the total revenues earned by exchanges on market data products? Who else incurs costs or earns revenues on market data products?

Market data and ancillary products offer by Exchanges and market data aggregators, such as Bloomberg and Refinitiv, are over tens of billion dollars business globally. Rather than repeating what's on the earlier mentioned research reports, we just want to use the word "ginormous" to describe the magnitude of this market.

Question 178

The Commission requests that commenters provide information on the number of players in the market data aggregator space, and provide information on how specialized these companies are.

Bloomberg and Refinitiv are dominated non-Exchange players. ICE Data Services is leading in the Exchange space. See earlier mentioned researches for details.

Question 179

To what extent is it necessary for market participants executing orders in NMS securities to purchase market data from all SROs? Please explain in detail.

Because of best execution requirement, subscribe to market data from all SROs or using smart order router have long been a trend, which is unhealthy (particularly the gap between PP and SIP has been widen significantly in recent year).

Question 180

How does the market for proprietary data differ from the market for consolidated data? Please explain in detail.

Both markets are largely electronified already. Yet, core data is used primarily for NBBO reference look up in serving BDs' compliance purpose, while PP is where trading algorithms would interact for trade execution, source liquidity, and perform market monitoring.

Question 181

Do you believe that exchanges have significant market power in the market for proprietary data products? Why or why not? Please explain in detail.

Yes, see this: <https://thehill.com/opinion/finance/398273-the-nyse-holds-a-troubling-monopoly-on-trade-data>

Question 182

In what situations can top of book data products serve as substitutes for SIP data in the equities market? In what situations are top of book data products not viable substitutes for SIP data? Please explain in detail.

Please see our respond to Question 38

Question 183

Do you agree with the Commission's assessment of the market for connectivity services? Why or why not? Please explain in detail. Do you believe that exchanges have significant market power with respect to connectivity services? Why or why not? Please explain in detail. What is the magnitude of this market? What are the total expenses incurred by broker-



dealers on connectivity services? What are the total revenues earned by exchanges on connectivity services? Who else incurs costs or earns revenues on connectivity services?

Question 184

Do you agree with the Commission's assessment of the market for trading services? Why or why not? Please explain in detail. How does market data and connectivity relate to the market for trading services? Can market power in one market translate into market power in another? Please explain in detail.

Exchanges' economy of scope across trading and data businesses, see our published article in 2018 for explanation: <https://www.linkedin.com/pulse/split-restructure-equity-market-kelvin-to/>

Question 185

Characterizing competitors as producers (an entity that creates a good or service for trade) or intermediaries (an entity that facilitates the trading of goods or services produced by others) could have implications for the competitive landscape. To what extent are exchanges producers versus intermediaries in market data products and/or other services (e.g., execution services, connectivity services)? Please explain in detail.

Exchanges are both producers and intermediaries. As Producers, or the value-added function it serve is: a robust mechanism to effectively and efficiently delineate asset rights (transfer ownership of assets in exchange for liquidity) at minimal cost. Because of this robust public market mechanism, resources are channel to where it will yield the highest productivity in support of the overall economic growth. However, the private market, meaning private equities and venture capital, has grown rapidly in recently years, challenging some sub-segments of market underserved by Exchanges. From the Intermediaries perspective, Exchanges and the proposed CCs are also middlemen adding layer of cost if it does not perform any value-added function. All market participants are contributing order flows or their trade data in an equal way to trading venues; however some get more equal rights to receive 32 mils super tier rebates. This is much like Animal Farm²⁰, while Exchanges seat in between in seeking rent from everyone. Again, Exchanges' economy of scope across trading and data businesses need to be curb to prevent exploitation.

Question 186

To what extent is market execution on one exchange a substitute for execution on another exchange? To what extent are they complements? Please explain in detail.

Rule 611 trade through rule explains it all. Market execution is a 'substitute', yet the rule requires appropriate reform. See this: <https://www.greenwich.com/account/time-fresh-look-trade-through-rule>

Question187

To what extent is market data from one exchange a substitute for market data from another exchange? To what extent are they complements? Please explain in detail.

Market Data offered by different Exchanges is 'Complementary' because it reflects different demands and supplies at different venues during different market timing, even though it may be the same securities being traded.



C. Economic Effects of the Rule

1. Economic effects pertaining to the proposed Core Data and Consolidated Market Data

Question 188

Do you agree with the Commission's analysis of the economic effects of creating definitions for "consolidated market data," "core data," "administrative data," and "regulatory data"? Why or why not? Please explain in detail.

Yes. As mentioned in Question 1, one cannot manage what cannot be measure or defined, so this is essential.

Question 189

Do you agree with the Commission's analysis of the economic effects of expanding the content of core data? Why or why not? Please explain in detail.

Yes and No, see [Table 1](#).

Question 190

To what extent would the expansion of core data reduce the value of current market data products? What would be the economic effect of any reduction? Who would benefit and who would incur costs of any value reduction? Would the reduced value result in a net welfare gain or loss? Please explain in detail and quantify if possible.

Mixed, see [Table 1](#).

Question 191

To what extent would market participants who wish to receive information currently contained in the exclusive SIP feeds that will not be included in the proposed definition of consolidated market data be able to obtain this information from other sources? What would be the likely price of such sources?

Go up because demand is inelastic, see #4, #6, #7, #8 in [Table 1](#) as well as our respond to Question 75.

Question 192

The Commission requests comments on the potential uses of expanded core data content. How would market participants use the expanded core data? Which market participants would be likely to use the additional depth of book data? To what extent would the users or uses differ from current users and uses? What would be the potential economic effects of the expanded core data? Please be specific.

The usage will be the same, particularly for moving blocks. Yet, rather than paying high cost for PP, hopefully level 1 data will be offered at lower price from CCs. That being said, lowering short term level 1 CMD data cost may not be sustainable if trading volume stays flat. Price may be a dismissible factor among others to affect BDs choice to switch from solely using SIP to CMD. Disparity between Whatever residual and allowed to be sold as PP would likely increase prices to take advantage on the inelasticity of demand given its disparity with CMD (market data is complementary not substitute).

Question 193

The Commission requests comment on the capacity requirements needed by exchanges, competing consolidators, and users resulting from expanded core data. Would any of these participant types need to upgrade systems to be able to handle the expanded data? If so, what would be the aggregate one-time and ongoing expenses of these upgrades? Would such expenses vary by type of entity or other factors? If so, what factors might affect these expenses and what would a reasonable range of expenses be for exchanges, competing consolidators, and users? Would the expansion of



core data increase any data latencies relative to today? If so, what would be the economic effect of the increased latency? Please be specific.

Yes, capacity definitely needs to be expanded. the consolidated data volume would likely be comparable to (though a bit smaller than) the (consolidated audit trail) (CAT) which targeted to process between 30-120 billion trade events daily or more than 29 petabytes of raw uncompressed data in 6 years. Also, building a SIP rival cost substantially more than ATS that handles only a subset of the total market volume. Posting quotes but not matching trades is in essence limiting business scope of CCs. Given there is also compliance burden, such as the SCI requirements, therefore we think the proposed twelve CCs would definitely cause too much competition hampering survival of CCs that rely on economy of scale to post quotes. The trillion dollar equity market simply cannot afford twelve multi-billion 'elephants' of 'CAT' liked size to concurrently operate.

Question 194

The Commission requests that commenters provide any insights they may have as to the effect of the addition of depth of book information, smaller quotes (from the definition of round lot), and the inclusion of auction information on the share of order flow received by various exchanges, ATSS, and other trading systems. If you expect the inclusion of such information to alter order routing decisions, please explain the factors that could determine the winners and losers and whether such changes would result in net welfare gains or losses. Please provide estimates of these potential effects.

To provide level 1 DOB in CMD seem already strike appropriate balance, while we counter suggested a DOB curve replication so as to prevent a “no fish can swim when the water is too clear” situation. Smaller quotes may help improve market participation level. Auction is a controversy as we mentioned in (iii) of Question 2. Calibrating market impact in open and close auctions typically requires specialists’ skills rather than easily comprehend by average investors. At the end of day, it boils down to choice.

Please see [Table 1](#) and [Table 2](#) regarding order flow dynamics across Exchanges, ATS, and Internalizers. Despite the added contents will narrow the content differential between CMD and PP, it absolutely do NOT “deemphasized speed as key to trading success”³. “Same format” hurts average investors and gives HFTs a permanent advantage (See [Figure 3](#)). Order routing would still compete on the basis of speed if the proposal is approved “as-is”. Two large market data aggregators stand to gain from others’ efforts in beaten up Exchanges, rather than much to contribute or innovate. HFT Internalizers and ATSS stand to gain from continue market fragmentation.

Question 195

The Commission requests that commenters provide any insights they may have as to the effect of adding the depth of book, smaller quotes, and auction information to the core data on traders who currently benefit from information asymmetries. Would any losses to these traders be offset by gains to others? If so, would there be net welfare gains or losses? Please explain in detail and also submit any insights you may have as to the size this effect.

Mixed, please see our respond to Question 194.

Question 196

The Commission requests that commenters provide any insights they may have as to the effect of the proposed round lot definition on the informational advantage currently possessed by those traders who obtain odd-lot quotes via proprietary feeds. Would any transfers between those who currently have access to this data and those who do not result in any welfare gains or losses? What effect would the proposed round lot definition have on trading strategies that exploit the hidden nature of odd-lots? Please explain in detail.



This effect is uncertain, but we welcome the proposed ‘smaller quotes’, so there will be less outliers in the data. ATS rely on these outliers to help BDs move blocks. Hopefully, the proposed change to odd-lot quotes would move some order flow back to lit venues with better transparency.

Question 197

Do you agree with the Commission’s assessment that the traders currently reliant on SIP data, who will be able to see price-improving odd-lot quotes in certain stocks, could create additional trades that do not currently take place? Why or why not? Please explain in detail.

No, **price may be a dismissible factor** among others to affect **BDs choice to switch** from solely using SIP to CMD (see [Table 1](#), [Table 2](#), and [Figure 2](#)).

Question 198

The Commission requests that commenters provide any insights they may have as to the effect of including depth of book information in core data on trading strategies that exploit the information in current depth of book data products.

Let face it, firms rely on ‘trading strategies’ but no speed lose out badly in current market⁹⁶. If prominent investment managers, like Bridgewater Associates⁹⁷, having substantial ETFs in their portfolio, what does that mean for alpha seeking stock pickers⁹⁸? Given that, we strongly advocate for prioritizing the address of latency issue to “deemphasize speed as a key to trading success”³. Please also see our respond to Question 38 to Question 43 regard DOB.

Question 199

The Commission requests that commenters provide any insights they may have as to the effect of including depth of book information in core data on the informational advantage currently possessed by those traders who obtain depth of book via proprietary feeds. Would any transfers between those who currently have access to this data and those who do not result in any welfare gains or losses? Please explain in detail.

With our upmost respect for these institutional buy-side that represent many pension funds, but we think it will be the same group of traders. Just paying less for CMD by beaten up the Exchanges and cutting a portion back to large market data aggregators.

Question 200

The Commission requests that commenters provide any insights they may have as to the use of depth of book information in running strategies that attempt to establish priority in the queue at a particular price level behind the top of book. Are such strategies ever run without access to depth of book information? How common are such strategies in the market?

“Without access to depth of book information”, we don’t think so given the “law of large numbers never loses”⁹⁹, and “patented algorithms”¹⁰⁰ allowing HFT systemic Internalizers to avoid toxic / unprofitable trades.

⁹⁶ http://public.econ.duke.edu/~boller/Econ.471-571.F18/Hedge_Funds_Retreat_WSJ_100818.pdf;

<https://www.chicagobusiness.com/finance-banking/another-big-chicago-trading-name-exits>

⁹⁷ <https://tabbforum.com/opinions/bridgewater-associates-modeling-ray-dalios-modeling>

⁹⁸ <https://www.chicagotribune.com/business/dollarsense/ct-biz-warren-buffett-index-funds-dollarsense-20190305-story.html>

⁹⁹ <https://www.bloomberg.com/news/features/2016-08-11/virtu-never-loses-well-almost-never-in-quest-to-upend-markets>

¹⁰⁰ <https://patents.google.com/patent/US7587347B2/>



Question 201

Would the inclusion of depth of book information in core data strain current throughput, processing, or storage capacities? If so, by how much? How costly would it be and who would incur the costs of upgrading capacity to handle depth of book information in core data?

Yes, any additional contents would be strain on current throughput, processing and storage capacities. Top-of-book versus 5 levels of prices for Level 1 data meaning exponentially increase volume by 5 times at any microsecond during trading day. The more CMD contents equate to PP, the harder it is technically to catch up on latency differential. Moore's law³⁴ said processing speed double every 18-24 months, therefore tradeoffs in contents is one of the means to catch up on speed. As mentioned in #2 and #14 of [Table 1](#), today's gap is already 10 times (the SEC's proposal is based on 10G connectivity while NYSE launched 100G colocation service since April 2020). This 10 times difference would soon become 40, 80, or even 160 times soon.¹⁰

Without mandating a secured synchronized start-time¹² and without requiring SROs to comply with "a ratio between the fastest non-CCs and the slowest CCs' connectivity NOT to exceed a 2.5 times threshold" to ensure core data evolve along ecosystem (see 'condition' after [Figure 3](#)), there is absolutely **no way anyone or any technological invention can reasonable catch up** with this latency gap or overly frequent upgrades by SROs. Policy makers **blindly believe in "drag race"** competition (among CCs and with also with other constituents) over an ever faster transmittal speed using microwave⁷, laser⁸, quantum⁹ technologies, etc. would **only benefit the telecom companies**, but never solve this entrenched, unfair, and discriminatory matter.

Question 202

Do you agree that the inclusion of odd-lot or depth of book information in core data would result in more efficient pricing? Why or why not? Please explain in detail.

Mixed or uncertain – Reduce information asymmetric usually improve price discovery. Yet, it may also expose the reality of demand and supply mismatch at certain given time, hence widen the spread for risk adverse behaviors of those who don't have the speed. Market timing triumphs over trade strategies in today's market that over emphasized on speed as key to trading success³.

Question 203

To what extent would any benefits of including depth of book information in core data depend on the degree to which orders "walk the book"? Which benefits, if any, depend on this? Please explain how.

Orders clear outside the NBBO could be relevant. NBBO provided at the time by an exclusive SIP has proven to be inferior in price to the price of smaller quotes at certain time. "Walk the book" without moving price is not easy in lit venues. Benefits from additional DOB information are uncertain or not conclusive if market large remains as a "drag race".

Question 204

To what extent would adding all auction information to core data result in such information being more widely disseminated, and what role do existing dedicated auction feeds play in this? If so, how would market participants use this more widely disseminated data and what would be the economic effect of this usage? Please explain in detail.

Auction volume is substantial while related market impact is significant. Calibrating market impact in open and close auctions⁵⁵ typically requires specialists' skills rather than easily comprehend by average investors. Some claimed, "Passive investing juggernaut is forcing investors to pile into crowded auction time – risking market stability"⁵⁶. We recognized



that the SEC, FINRA, SROs and institutional traders might be interested to research on HFT competition and liquidity on batch auction markets versus continuous-time trading⁵⁷. We also cannot rule out certain retail investors might be interested and have a potential positive impact on auction price discovery process. At end of day, it boils down to choice.

Question 205

Would disseminating auction information in core data increase participation in auctions? Why or why not? What would be the economic effect of any change in auction participation? Would this change in auction participation improve price discovery? Please explain.

Uncertain, see our respond to Question 204.

Question 206

What are the initial and ongoing technology costs that competing consolidators would incur to collect, compile, process, and disseminate the expanded core data? How would these costs vary across potential competing consolidators – current exclusive SIPs, current market data aggregators and self-aggregators, and new entrants? Would these costs constitute a significant barrier to entry to becoming a competing consolidator? Why or why not? Please explain and provide quantified costs.

The SEC's estimated costs for CC is far too low because the consolidated data volume would likely be **comparable to** (though a bit smaller than) the Consolidated Audit Trail (CAT) project which targeted to process between 30-120 billion trade events daily or more than 29 petabytes of raw uncompressed data in 6 years. Also, building a SIP rival cost substantially more than ATS that handles only a subset of the total market volume. Posting quotes but not matching trades is in essence limiting business scope of CCs. As mentioned in #14 of [Table 1](#), Exchanges continuing to offer connectivity at different latencies exacerbate the “drag race”, further promote product differentiation by CCs might just be wishful thinking because CCs rely on economy of scale, not economy of scope. Besides, the more CMD contents equate to PP, the harder it is technically to catch up on latency differential. Moore's law³⁴ said processing speed double every 18-24 months. Today's gap is already 10 times different (i.e. SEC's proposal is based off 10G while NYSE already offer 100G). Upgrade to 400G and 800G connectivity could happen next month or within this year¹⁰. In other words, not sufficient time to reach critical mass for a large enough base of consumers to spread the ever higher fixed cost even if the proposal was suggesting three instead of twelve CCs to divide the market. Frankly, the latest and most advanced tech **development costs usually amortize in 10 years, having investments burnt out every 2 years isn't worth it.**

Question 207

What are the initial and ongoing technology costs that exchanges would incur to disseminate the expanded core data to competing consolidators? Please quantify these costs. Do commenters agree that these costs would be minimal to the extent that exchanges are already disseminating such information in proprietary data feeds? Why or why not? Please explain.

We agree, it should be minimal costs for existing Exchanges to become CCs. Please also see #10 in [Table 1](#).

Question 208

What would be the initial and ongoing technology expenses incurred by market participants to receive and process the expanded core data for their intended uses? Please quantify these expenses. Do you agree that such technology expenses would be minimal for those market participants that currently receive and process such information from proprietary data feeds? Why or why not? Do you agree that such technology expenses would be mitigated by the fact



that only those market participants that would significantly benefit from receiving and using such data would choose to receive it? Why or why not? Please explain in detail.

Switching cost, development, QA, a large G-SIB costed about a million to replace / integrate a new feed. Smaller firms would try to do the same at lower cost. Yet, CMD price may be a dismissible factor among others to affect BDs choice to switch. Fitting latency requirement, adapting to complex order requirements, sourcing available liquidity for certain securities to match the unique needs of different BDs are what counted.

Question 209

Do you agree with the Commission's range of the potential increase in message traffic associated with the expansion of market data? Please explain and provide alternate estimates as necessary. How would the costs incurred by exchanges, competing consolidators, and data users depend on the increase in message traffic? Would the relation between message traffic and costs for each of these entities be linear, concave, or something else?

We don't disagree with the Commission's estimate for potential increase in message traffic volume. However the costs incur to manage big data is not linear or concavely variable to message traffic. Data velocity according to time granularity precision requirements play a huge part for why aggregators have cost structure like stacking blocks with each step up is cost much higher than the last. Data varieties due to added contents increase complexity in processing as well as validating the veracity of data. This is never simple, whenever one tries to push the edge of technologies, the development cost grow exponentially, which explains why R&D costs are amortized over a long period.

(c) Proposed Amendments to the NBBO and Protected Quotes and Other Conforming Changes

Question 210

Effectively, the proposed round lot definition reduces the minimum quotation size for the NBBO, depending on the price of the security. The Commission requests that commenters provide any insights they may have as to the economic effects of price-improving odd-lot quotes being reported as the NBBO in the new core data.

Please see our respond to Question 29 to Question 36.

Question 211

Do you agree with the Commission's data analysis of the potential frequency of improvements to the NBBO and the magnitude of improvements to the NBBO spread? Why or why not? Please provide additional data analysis as needed to support your answer.

Yes – potential frequency of improvements to the NBBO. Uncertain – the magnitude of improvements to the NBBO spread because history does not necessarily reflect same performance in the future. Right market-timing and right prediction of the magnitude is always hard to achieve.

Question 212

What would be the economic effects of the proposed changes to the PBBO? For the twelve stocks that currently have a round lot defined as one share, how often would such securities not have a protected best bid ("PBB") or protected best offer ("PBO")? What would be the economic effects of not having a PBB or PBO in these stocks? For stocks that tend to have a significant number of odd-lots that are rolled-up into the current PBBO, the proposed changes to the PBBO could widen the PBBO spread. What would the magnitude of this increased spread be and how often would the PBBO be wider?



Would a wider PBBO necessarily result in higher transaction costs for investors? If so, by how much would transaction costs increase? Please explain and provide any data analysis needed to support your answer.

In midst of systemic market reform, one cannot ask for too much. How the twelve stocks may be affected is something we all have to wait and see. Please also see our respond to Question 29 to Question 36.

Question 213

How do exchanges currently calculate their protected quotes? If the proposal were to allow odd-lots to be rolled up across prices to create a protected quote, how would the PBBO be different than the proposed PBBO? Would the economic effects of such a change be different than the economic effects of the proposed protected quotes? Please explain.

This question is best left to the SROs to answer.

Question 214

How would the changes to the NBBO and protected quotes affect off-exchange executions? What benchmark price would ATSS, internalizers, and other off exchange venues use to price transactions? Would this differ from current practice? Please explain. What would be the effect of this on transaction costs of off-exchange executions? How large would any change in transaction costs be?

If “central risk book” as a bank’s compliance tool can be packaged as ‘liquidity’ to sell to the buy-side, claiming it won’t cross the line of proprietary trading for potential Volcker violation, then it won’t be difficult for SAs, including ATSS, Internalizers, and other off exchange venues to come up with creative ways for alternate benchmarks to price transaction/ executions. Using an analogy of a foreign currency pegged with the US dollar versus a basket of other assets, different NBBOs calculated by CCs in silos erode the de facto status¹⁹ of SIP’s NBBO that broker-dealers rely on globally, push the US market to reduce to the level of brokenness like the Europe or other markets, and impact liquidity.

Question 215

How would the proposed changes to the NBBO and protected quotes affect transaction costs incurred by various investor types – e.g., active institutional investors, passive institutional investors, and retail investors? Please explain. How large would any change in transaction costs be for each investor type? Please provide any data analysis needed to support your answer.

How changes to NBBO in equity market, may have a bigger effect on options and futures markets, and in turn the overall transaction costs incurred by various investor types – e.g., active institutional investors, passive institutional investors, and retail investors. Because of disparity, Exchanges would raise prices for non-equity PP to take advantage on inelasticity of demand, and battlefield swift further to the derivative and/or more fragmented markets which are harder to regulate and oversee.

Question 216

How would the proposed changes to the NBBO and PBBO affect order routing decisions and the share of order flow captured by each exchange and off exchange venue? Would some exchanges or other venues gain order flow while others lose order flow? What are the factors that could determine a gain or loss in order flow? Can you quantify this change in order flow? What would be the economic effects of any changes in order flow? Would such changes result in net welfare gains or losses? Please explain in detail.



See [Table 1](#) and [Table 2](#) regarding our expected change to order flow dynamics for lit versus dark venues, favoring ATSS and Internalizers. Transaction cost analyzers, smart order routers, outsource trading, rebates or privilege disadvantages and other opportunity costs should all be counted toward the real economic costs in transacting in today's markets, not merely the venues' trade processing fees. Continue market fragmentation would be a net welfare loss in our opinion.

Question 217

Under the proposed NBBO, what would ATSS and other off-exchange venues use as a benchmark to price executions on their system? How would this affect execution quality for investors? How would the proposed NBBO affect the operation of certain orders types on ATSS? Please explain.

See our respond to Question 214

Question 218

To what extent would the proposed NBBO result in additional message traffic for those market participants who currently rely on SIP data and, under the proposal, would receive and use NBBO but not depth of book information? Would these market participants incur significant initial costs to prepare to receive and use such additional message traffic? Would these market participants incur significant ongoing costs in receiving and using such additional message traffic? Do you agree that most such broker-dealers currently pay for SIP NBBO data on a "per query" basis and, therefore, would not incur significant initial or ongoing costs as a consequence of any increase in message traffic? Please explain.

Money has to come from somewhere. Breaking Exchanges' alleged monopoly⁴ does not mean mercy for those who have no plan to use the expanded data. After cutting a portion of the gains to CCs, the added cost due to expanded contents will be mixed in with the residual savings. In other words, those non-users of the additional data will implicitly absorb part of unnecessary cost to them, which we think it could be unfair.

Question 219

To what extent would the proposal result in exchanges and other trading venues incurring costs to reprogram their matching engines to account for changes in the NBBO and protected quotes?

We would call it "investments" rather than "incurring costs" to reprogram matching engines. This is a warring states period³⁹, "war to end all wars"⁵ has historically proven to fail and many adverse consequences⁶.

Question 220

Do you agree with the Commission's assessment about the implementation costs for implementing a definition of the protected quote that differs from the NBBO? Why or why not? Please also submit any insights you may have as to the size and scope of the effect of this change.

We have no objection. Just make sure NBBO won't be interfered or influenced by CCs or market data aggregators²⁶ with ties to foreign government officials³³.

Question 221

Would the change to the NBBO result in an increase in the proportion of time in which the market is locked or crossed? Why or why not? If so, what would be the economic effects of this increase? Would this effect vary across securities? Please explain in detail.

Don't know, will wait and see.



Question 222

How often do locks or crosses occur between odd-lot orders today? Please provide any data analysis needed to support your answer.

Healthy Markets Association already shared their odd-lots study⁹² with the SEC and exchanges, and we believe their information is accurate and trustworthy.

Question 223

Would an increase in locked or crossed markets result in market participants incurring additional implementation costs to account for this increase? If so, what would be the magnitude of the additional implementation costs? Please quantify. Do you agree with the Commission's assessment of the relevant costs?

Don't know, will wait and see.

Question 224

Do you agree that the proposed definition of the NBBO could change the benchmark price for short sale executions following a trigger of Rule 201 of Regulation SHO? What would be the economic effects of the changes in the benchmark? Would the proposal significantly increase the burdens on short selling following a trigger? Please explain.

We do not want unnecessary restriction on market participants' ability to short sell⁶⁶. We do think NBB is a better choice than "protected bid" as the reference price despite costs might be indifference. We are not sure of the economic effects, this may have to wait and see, or Regulation SHO circuit breaker would need to be revisited in view of the economic turmoil caused by the Coronavirus pandemic.

Question 225

Do you agree that the proposed definition of the NBBO could reduce the frequency of triggers of Rule 201 of Regulation SHO? Would such a reduction have significant economic effects? Why or why not? Please explain.

Don't know.

Question 226

How would the proposal alter the operation of Rule 605? If so, would such changes have any economic effects? Would execution quality appear better or worse for all market participants or would it affect the relative appearance of execution quality? Would the changes result in actual changes to execution quality or just apparent changes in execution quality? Would the changes result in fewer orders being included in the Rule 605 statistics? Please explain.

See our respond to Question 7 and Question 24

Question 227

The proposed changes to the NBBO and Protected Quotes likely affect the operation of numerous SRO rules. Please provide information on the number and type of SRO rules that rely on the NBBO or protected quotes. Assuming the SROs do not propose amendments to these rules, what would be the effect of the proposed changes to the NBBO and protected quotes on the operation of these SRO rules and the likely resulting economic effects? How much would SROs expend in proposing to amend their rules, assuming the SROs choose to amend their rules? Please provide estimates of such costs.

This question is best left to the SROs to answer.



2. Economic effects pertaining to the proposed Decentralized Consolidation Model

Question 228

Do you agree with the reasonableness of the Commission's assumption that the proposed amendments would lead to multiple competing consolidators participating in the consolidated market data business and distributing data to market participants? Why or why not? Please explain in detail.

We DISAGREE. The multiple CCs may just be the 2 large market data aggregators. Existing players may buy-in to DCM because they have almost no incremental cost to become CCs. Their revenue upside depends on how hard the SEC and industry beaten up the Exchanges on their behalf. Maximize life of aged technologies beyond 10 years' amortization period is in existing aggregators' best self-interest. Breakthroughs require fresh innovations from someone new. Market reform should allocate most rewards and provide a reasonable return for those who are able to innovate and contribute.

Question 229

Are you an organization that would want to provide the competing consolidator service described? If so, please include an estimate of how much effort would be required for you to begin providing this service in the market. If you are willing to provide price estimates, please do so as well.

May be, we do like the opportunity to be considered as one of the CC contenders under conditions, including appropriate modifications of the DCM proposal and uses of our patent. That being said,

- Development costs usually amortize in 10 years, having investments burnt out every 2 years to engage in a drag race' of microwave, laser, quantum technologies isn't worth it. There simply not sufficient time to reach critical mass for a large enough base of consumers to spread the ever higher fixed cost.
- Dominated market data aggregators, like Bloomberg and Refinitiv, would most likely spread their fixed cost to large customer base in quickest time. Yet, maximize life of aged technologies seems rational short-term business behaviors for existing encumbrances. Why be a rival to disrupt their business model, even though we got better innovations? Reform requires allocation of most rewards to those who can innovate.
- Besides, the current proposal really hesitate anyone to throw-in money for all the hardware, use own balance sheet to finance the subscription of data and connectivity for the BDs community, and subject itself to compliance burden if CC cannot earn a reasonable return.
- One may be better off becoming an SA. Building a SIP rival cost substantially more than ATS that handles only a subset of the total market volume. Posting quotes but not matching trades is in essence limiting CCs' scope.
- In addition, the proposal is in essence asking CCs to use own money to create business continuity/ disaster recovery backup for SIP with expanded functionalities, as well as subject to Reg. SCI requirements.
- Last but not least, the proposal has not provided any reasonable mean to negotiate with power suppliers – i.e. the large Exchange Groups, unless mandating the use of TLC and requiring SROs to comply with a ratio between the fastest non-CCs and the slowest CCs' connectivity not to exceed a 2.5 times threshold. If a SRO intends to upgrade its fastest connectivity beyond (or already exceeded) the 2.5 times threshold, the SRO should cover the prices difference to upgrade CCs' connectivity for FREE. Besides, the SRO should offer older model equipment for FREE or at discounted price to subsidize/ cover the cost of CCs and BDs for necessary replacements and/or upgrades.

We do have many options, including license out our patents to any parties of interest. That being said, we do want to give this priority and exclusivity for the SEC and SROs to consider first if our patent may be used to enable a smooth transition to the new equilibrium and us serving as the 'conduit' to benefit the broader industry (see Question 154).



Question 230

What factors are likely to influence the decision of various market participants to become competing consolidators? How large would be the barriers to entry to becoming a competing consolidator? Would there be any sources of barriers to entry other than building the technological infrastructure, filing Form CC, and complying with the other regulatory requirements associated with being a competing consolidator?

See [Table 1](#) and [Table 2](#)

Question 231

Which market participants would be likely to become competing consolidators? Are the current exclusive SIPs likely to become competing consolidators? Why or why not? Would existing market aggregation firms become competing consolidators? Why or why not? Would any other types of firms likely become competing consolidators? Why or why not?

See [Table 1](#) and [Table 2](#)

Question 232

How would the Commission's assessment of the economic effects of the rule be affected by too few competing consolidators? Please be specific.

As far as we see, the Commission got two – Bloomberg and Refinitiv. Adding the two to Exchanges' existing SIPs won't change much of the oligopoly structure for market data. Market reform should allocate most rewards and provide a reasonable return for those who are able to innovate and contribute.

Question 233

To what extent would the adoption of the various proposals in Section III independently respond to some or all of the issues the proposed competing consolidator model is intended to address?

Satisfying some institution buy-side, but many adverse consequences, including latency differential issue remains unaddressed. We suggest modifying the proposal to consider TLC for synch start-line and require SROs to comply with a connectivity ratio threshold.

Question 234

Do you agree with the Commission's assessment of the potential effect of the proposal on data fees? In particular, do commenters agree with the Commission's conclusion that the proposal could reduce overall data fees? What is the likely effect of the proposal on each of the components of the overall data fees, fees for consolidated market data, fees for proprietary market data, and fees for connectivity? What are some of the important factors that could result in fee increases and decreases? Please explain in detail.

The proposed 3 sets of fees for CCs are commendable because it has a good mix of diversified constituents to participate in pricing decisions. That being said, the underlying issue in the market is not so much of “**demonstrating**” the fairness and reasonableness of those fees per se, but “**achieving**” a fair state of new equilibrium. In other words, there need an answer to the “**Who gets what – and why**”⁴⁴ question in resolving the access fee rebate controversy⁴⁵, finding new revenue stream after online broker race to zero fees⁴⁶, as well as way to prevent Exchanges from commanding premium price or limiting privileges to only a small group of elites²⁰. For that, we envisage, after the era of an arm-race on speed⁴⁷, a new **modernized NMS Plan** would **reward those who are able to innovate and contribute**. To encourage more, especially emerging BDs and average investors, to participate in the market and “grow the pie”, we have to equip these people with the tools, give them an opportunity to trade competitively against the Wall Street Titans (see ④).



Question 235

The Commission requests that commenters provide any insights or data they may have as to potential changes in connectivity fees and the effect of these new connectivity fees on the proposed competing consolidator business.

See 'conditions' after [Figure 3](#). If a SRO intends to upgrade its fastest connectivity beyond (or already exceeded) the 2.5 times threshold, the SRO should cover the prices difference to upgrade CCs' connectivity for FREE. Besides, the SRO should offer older model equipment for FREE or at discounted price to subsidize/ cover the cost of CCs and BDs for necessary replacements and/or upgrades. We want to emphasize that this is NOT to penalize anyone in pursuit of ever faster speed to make the market more efficient. We believe having a mechanism to encourage social responsibilities is a key driver to "grow the pie" and foster sustainable development of NMS. Indeed, this is similar to phone plans and mobile device offers in the telecom industry. This "2.5 times threshold" provides "trading venues with sufficient opportunity and flexibility to innovate"³, while "ensures that core data evolves along with the broader market ecosystem"².

Question 236

Do you agree that there would be three potential benefits from the increased competition provided by the decentralized consolidation model: efficiency gains in the delivery of consolidated market data, improvements in technological innovation in consolidated market data, and reductions in latency? Why or why not? If not, which benefits do you disagree with? Please explain.

NO, please see pages 1-11 for an elaborated answer.

Question 237

What are the benefits of expanding Regulation SCI to define competing consolidators as "SCI entities"? What are the costs of expanding Regulation SCI to define competing consolidators as "SCI entities"? Please explain and provide cost estimates, if available.

See our respond to Question 117 to Question 126

Question 238

The Commission requests that commenters provide relevant data and analysis to assist in analyzing how the total price of proposed consolidated market data (including the data fee paid to the operating committee(s) of the effective national market system plan(s) for NMS stocks and service fees paid to competing consolidators) in the decentralized consolidation model would compare to current pricing of SIP data. More specifically, how would the aggregate fees paid by various types of market participants under the decentralized consolidation model likely compare to the aggregate fees paid by the same types of market participants for the same data today, assuming the content of the data consumed by market participants remains constant but the providers of that data change? Would any market participant types be likely to expand the data they purchase if such data is included in the definition of consolidated market data? Please explain. How would the aggregate fees paid by such market participants under the decentralized consolidation model likely compare to the aggregate fees paid by them today, assuming such market participants expand the data they purchase? Please quantify if possible.

Please see our respond to Question 206 for the one time cost. Then, the proposal essentially ask CCs to use own money to build twelve BCP/DR backup with expanded functions of SIP, so multiplying that one time cost by twelve CCs, and adding switching costs for BDs ... Who will pay for it, would it ultimately be bear by average investors ... we have serious doubts that these 'billions' would ever be justified.



Question 239

Do you agree with the Commission’s assessment of the costs incurred by potential competing consolidators as a result of the proposal? Specifically, do you agree that potential competing consolidators would incur initial costs of \$0.6 million to \$3.9 million and ongoing costs of \$2 million and \$2.6 million? Why or why not? Please provide revised cost estimates, if possible. How would these costs vary across the types of entities likely to become competing consolidators? What costs would be common across competing consolidators?

Absolutely NOT, please see our respond to Question 206 , Question 208, Question 209, and Question 238.

Question 240

Do you agree with the Commission’s assessment of the costs to each SRO of amending effective national market system plan(s) for NMS stocks to implement the proposed decentralized consolidation model? Why or why not? Please explain and provide alternative cost estimates, if possible.

We have no objection on this cost assessment.

Question 241

Would existing SIPs and exchanges lose business as a result of the proposed decentralized consolidation model? If so, what is the nature and potential magnitude of the business they would lose? Could any exclusive SIPs or exchanges gain business as a result of the decentralized consolidation model? Please explain.

Large Exchange Groups have reasons to consider whether being a “supplier” versus an “operator” of SIP would give them a higher commercial benefit. SROs, with the exception of IEX, will cover whatever loss in SIP revenues by other price increases of PP. Taking over the SIP’s existing 70+ millions revenue may be a viable strategic choice for IEX. Overall, the proposal bias towards SAs, and favored the dark over lit venues.

Question 242

Would the proposed decentralized consolidation model result in more NBBOs than could be viewed today? If so, would this increase the complexity of our markets? Why or why not? Please describe any economic effects resulting from an increase in multiple NBBOs.

It is convenient to say “Multiple NBBOs would not vary from today’s self-aggregating practices or is non-novel/ insurmountable”. However, it will cause much complexity to the market. Using an analogy of a foreign currency pegged with the US dollar versus a basket of other assets, different NBBOs calculated by CCs in silos erode the de facto status¹⁹ of SIP’s NBBO that broker-dealers rely on globally, push the US market to reduce to the level of brokenness like the Europe or other markets, and impact liquidity.

Question 243

Do you agree with the Commission’s assessment of the costs to data users of potentially switching from purchasing market data from exclusive SIPs and/or exchanges to purchasing market data from competing consolidators? Why or why not? Please explain. Do you agree that these costs are likely to vary among types of market participants?

Cost likely to vary among different market participants, please see our respond to Question 208.

Question 244

Would the proposed amendments result in the interruption of data available for research by the academic community and investors, such as TAQ data? If so, the Commission requests that commenters provide relevant data and analysis to assist



us in determining the incremental social welfare cost of such interruption of data to the academic community and investors.

It is what it is, the academic community would have to make adjustments whenever market dynamic evolves, so this is irrelevant and shouldn't be part of policy makers' consideration in this market reform.

Question 245

How costly would be the proposed changes to the entities responsible for requirements of Regulation SHO, LULD and MWCB for listing exchanges? What is the magnitude of such costs that derive from implementing processes to continuously calculate and track data metrics for compliance with the proposed changes? What is the magnitude of such costs that derive from notifying the competing consolidators and others of price bands and triggers? Does the magnitude of such costs depend on the number of competing consolidators?

This question is best left to the SROs to answer.

Question 246

Do you agree with the Commission's assessment of the benefits of subjecting competing consolidators to Regulation SCI requirements? Why or why not?

SCI as 'best practices' versus compliance burden, at the end of date, it is better to use some benchmark tests than formality on paper documents.

Question 247

Do you agree with the Commission's assessment of the costs of subjecting competing consolidators to Regulation SCI requirements? Why or why not? Do you agree with the Commission's estimates of the costs involved? Please explain in detail.

No objection to this SCI cost assessment.

Question 248

Are geographically diverse backup systems a standard practice among firms likely to become competing consolidators today? What effect does the answer to this question have on the likely cost for competing consolidators to maintain geographically diverse backup systems?

Most recent backup would be onsite, while archives would be offsite to lower cost.

Question 249

Do you agree with the Commission's assessment on the impact of Regulation SCI requirements on third-party vendors employed by competing consolidators? Why or why not? To what extent do potential competing consolidators contract with third-party vendors for systems that would meet the definition of an SCI system? What is the magnitude of costs to third-party vendors who operate these systems to make sure these systems meet the requirements of Regulation SCI? What effect will this impact have on the ability of competing consolidators to provide reliable data products? Please explain and provide estimates, if possible.

DCM model can be viewed as Exchange outsourcing its market data services to CCs. Then CCs employ third-party vendors to support certain SCI requirements. How good is that to keep the US employment level up! 😊



Question 250

Do you believe that the amendments to Regulation SCI could reduce innovation among new competing consolidators? Please explain. If so, which provisions of Regulation SCI affect innovation the most and how? Please explain.

It is not the SCI requirements that hesitates innovation, but development costs usually amortize in 10 years. Having investments burnt out every 2 years to engage in 'drag race' of microwave, laser, or quantum technologies isn't worth it.

Question 251

How significant is the barrier to entry provided by Regulation SCI requirements on potential competing consolidators? Do you believe this will have a significant impact on the number of entities who enter the competing consolidator business? Why or why not?

Some, but SCI is acceptable.

3. Economic effects of Proposed Form CC

Question 252

Do you agree that Form CC would help market participants make better-informed decisions about which competing consolidators to subscribe to in order to achieve their trading or investment objectives? Why or why not?

It's fine.

Question 253

Do you agree that the process for the Commission to declare an initial Form CC ineffective would promote the quality of information the Commission receives from competing consolidators? Do you agree that the quality would affect the ability of the Commission to protect investors? Why or why not?

The Commission shouldn't rely on well-articulated documents to assess performance but use subjective tests to benchmark results.

Question 254

Do you agree with the Commission's assessment of the costs of Form CC? Please explain and provide cost estimates, if available.

It seems reasonable.

Question 255

Do you agree that filing initial Form CC and amendments to Form CC electronically with the Commission through the EFFS system would reduce filing costs and increase benefits compared to filing paper forms? Please explain.

It may not be justified given only 12 or less CCs, but that is fine.

Question 256

The Commission has provided cost estimates that competing consolidators would incur for accessing and filing using the Commission's EFFS system. Do you believe these cost estimates are accurate? If not, please explain. Do you believe there are other costs potential competing consolidators would incur related to using the EFFS system that the Commission should consider?

It seems reasonable.



Question 257

Do you agree that the proposed performance metrics would create operational transparency of competing consolidators and allow subscribers and potential subscribers to evaluate and compare the performance of competing consolidators? Please explain. Do you agree that posting the monthly performance metrics on the websites of the competing consolidators would limit the ability to compare competing consolidators relative to posting or filing the metrics in a central location? Please explain.

No, please see Question 112 and Question 113

Question 258

How costly would it be for competing consolidators to calculate and post the performance metrics? Please explain and provide cost estimates.

Not much relative to other costs.

Question 259

The Commission has provided cost estimates that competing consolidators would incur for posting monthly statistics on their websites. Do you believe these cost estimates are accurate? If not, please explain. Do you believe there are other costs competing consolidators would incur related to posting monthly statistics on their websites that the Commission should consider? Please explain.

It seems reasonable.

Question 260

Do you agree with the Commission's assessment of the costs imposed by the process for declaring an initial Form CC ineffective, including the uncertainty it would create? Please explain.

Please see our respond to Question 93

4. Economic effects from the Interaction of Changes to Core Data and the Decentralized Consolidation Model

Question 261

Do you agree with the Commission's analysis of the effect of the proposal on the proprietary data business? Why or why not? Please explain in detail.

No, the effect on PP would actually be opposite because demand is inelastic.

Question 262

Would exchanges lose proprietary data business as a result of the proposed decentralized consolidation model? Why or why not? Please explain. Would any market participants still elect to purchase proprietary data feeds from exchanges? If so, which market participants? Please explain in detail. What would be the net effect of any changes in this business?

No, again demand is inelastic.

Question 263

The Commission invites comment on the role of SIP data revenue and proprietary feed revenue in the overall data revenue of exchanges. To what extent do exchanges rely on each source of revenue? Please explain in detail.



Question 264

Do you agree with the Commission's analysis of the effects of the proposed amendments on the broad financial industry data services industry? Why or why not? Please explain in detail. Would the proposal lead to new broker-dealers developing SORs, new market makers, or other new latency sensitive traders? If so, what would be the economic effect of these new players? Please explain in detail.

Disagree, please see [Table 1](#)

Question 265

Do you agree with the Commission's analysis of the effects of the interaction between the proposal and the Consolidated Audit Trail? Why or why not? Please explain.

Agree, but does it really help CAT or solve the IOSCO⁹⁰ surveillance challenges? We have a counter suggestion for CAT, please see this: <https://www.linkedin.com/pulse/hr-block-analogy-cat-combating-fraud-kelvin-to/>

Question 266

Would the proposal result in more complete and/or accessible CAT Data? Please explain. How would regulators use the additional CAT Data resulting from the proposal and how would investors benefit from this usage? Please explain.

Why would secondary data at CCs be better than primary data at original sources?

Question 267

To what extent would the proposal alter the SROs enhanced surveillances using CAT Data? Please explain. Would the proposal result in SROs incorporating more depth of book and auction information into their surveillances? What would be the costs and benefits of doing so? Please explain.

SROs have full depth of book and auction information, they should use it for surveillance and we would be happy to help.

Question 268

If the proposal resulted in FINRA CAT switching data providers, what would be the switching costs? How would the proposed amendments affect the implementation and ongoing costs of CAT? Please provide estimates if possible.

Instead of "receive" data from CCs, CAT should access directly to SROs' or CCs' real-time analytical platform (RTAP) to conduct analysis and monitor trade activities in real-time. CAT's "T+5 Regulatory Access" is too late in our opinion.⁸⁹

Question 269

Do you agree that the proposal would not affect the implementation of CAT? Please explain.

In our opinion, golden source of data may never be achieved or the market dynamics already change by someone claims they "perfected" the data. So let accept the data as what it is and devote more efforts into analysis. Our patent address the IOSCO⁹⁰ / Flash Crash⁹¹ challenges, and we suggest leveraging the crowd to discover unknown unknowns (see [4](#)).

Question 270

Do you agree with the Commission's analysis of the effects of the proposal on data vendors? Why or why not? Please explain.

Costs for CMD may go down but PP would go up, so data vendors do not benefit in net, except the 2 supersized market data aggregators. The proposal is irrelevant to the ability of most vendors. Smaller data vendors may face consolidation by large vendors rather than grow customer base, exacerbate the oligopoly situation. Yes, range and quality of products



would have to improve based on new expanded core data, but no one would have extra budget to pay for it, so end-up data vendors absorb the costs internally to maintain customer relationships. Talents in finance data vendor space flee to join other industry because it is a shame that even online gaming industry uses LEQ, while electrified markets adopt a lower standard. Smaller data vendors could potentially face an out of proportion or unfair cost (additional upgrades to their systems beyond the proposal in order to receive the additional odd-lot data), which when passed on to clients could cause their customer base to shrink. In the event that these outcomes are severe, it is possible that some data vendors could exit the market.

5. Economic effects of the Proposed Rule

Question 271

Do you believe the Commission's analysis of the potential economic effects of the proposed amendments is reasonable? Why or why not? Please explain in detail.

Please see our respond to Question 133 to Question 138 and Question 144.

Question 272

Do you believe the proposed amendments may have unintended consequences that are not captured by the Commission's analysis of the potential economic effects? Why or why not? Please explain in detail.

Please see ② and ③

Question 273

Do you agree with the Commission's analysis of the benefits of the proposed amendments? Why or why not? Please explain in detail.

Partially agree, partially disagree. Please see [Table 1](#).

Question 274

Do you agree with the Commission's analysis of the costs of the proposed amendments? Why or why not? Please explain in detail.

Hard to say, there're lots of variables.

Question 275

The Commission requests that commenters provide relevant data and analysis to assist us in determining the economic consequences of the proposed amendments. In particular, the Commission requests data and analysis regarding the costs SROs, exclusive SIPs, and market participants may incur, and benefits they may receive, from the proposed amendments.

Reference to [Figure 2](#), let's get the 'circle of influence' right to align interests and figure out the interdependency to grow the pie, then we will talk about how to be fair. We can't wait to see how other market participants would respond to the proposal. By then, we will be able to better gauge what economic consequences there may be.

D. Impact on Efficiency, Competition, and Capital Formation

Question 276

Do you agree with the Commission's analysis of the effects the proposed amendments might have on efficiency, competition and capital formation? Why or why not? Please explain in detail.



As mentioned in our respond to Question 202, reduce information asymmetric usually improve efficiency for price discovery. Yet, it may also expose the reality of demand and supply mismatch at certain given time, hence widen the spread for risk adverse behaviors of those who don't have the speed. Market timing triumphs over trade strategies in today's market that over emphasized on speed as key to trading success³.

Our view about competition may be very different from the Commission's analysis, particularly with respect to the role of SAs, see [Table 1](#), [Table 2](#), and the suggested 3 Pillars Model in [Figure 1](#).

We do agree the proposal's economic effect on capital formation may be minimal if it remains as-is. That being said, right course the ship to uphold market integrity and fairness values of public market helps revitalize trust in Wall Street. The public markets shouldn't be a dump ground for private market's exit strategy or 'only' serving the same old issuers without new bloods. Allowing healthy competition between public and private markets would positively booster capital formation in our opinion.

Question 277

Do you believe the proposed amendments may have unintended consequences that are not captured by the Commission's analysis of the effects the proposed amendments may have on efficiency, competition and capital formation? Why or why not? Please explain in detail.

See [Table 1](#) and [Table 2](#)

Question 278

Do you agree that the proposed amendments would lead to gains from trade? Do you agree that the proposed amendments would improve the efficiency or order execution? Do you agree that the proposed amendments would improve price efficiency? Do you agree that the proposed amendments would improve the efficiency of how core data is distributed? Please explain.

Mixed, short-term gains would not be sustainable if trading volume stays flat. Also, Exchanges may exploit any disparity between CMD and PP. The "rich" may be allowed to access connectivity that not reasonably affordable to average investors, and "same format" hurts average investors and gives HFTs a permanent advantage.

Question 279

To what extent does the gap in information between SIP data and proprietary DOB products affect price efficiency? Are these effects larger in less actively traded securities where the gap in information between SIP data and proprietary DOB products is larger? Please explain in detail.

PP fees will go up rather than go down because demand is inelastic. Benefits from less expensive alternatives to PP will be offset if Exchanges exploit disparity (level 2 DOB, OTC, non-equity data, etc.) to recover loss profits to CMD. Please also see our respond to Question 202.

Question 280

Do you believe the proposed amendments would have effects on efficiency that the Commission has not recognized? Please explain in detail.

No additional thoughts at this moment besides what we have already mentioned.



Question 281

Do you agree with the Commission's analysis that the proposal will have a substantial impact on competition in several markets? In particular, do you agree that the decentralized consolidation model improves the competition in the market to distribute consolidated market data? Do you agree that the decentralized consolidation model creates more viable substitutes for proprietary exchange data? Do you agree that the proposal increases competition to provide smart order routing? Do you agree that the proposal could affect competition among exchanges to provide transaction services? Do you agree that the proposal could affect competition among traders? Do you agree that the proposal could affect competition among exchanges and off-exchange trading venues? Please explain in detail.

Our view about competition may be very different from the Commission's analysis, particularly with respect to the role of SAs, see [Table 1](#), [Table 2](#), and the suggested 3 Pillars Model in [Figure 1](#).

Question 282

Do you agree that the public disclosure of Form CC and the performance metrics promote competition more than if such information were not disclosed? Please explain.

Form CC is okay, while metrics not very helpful. We counter suggested benchmark tests.

Question 283

Do you agree that the extension of Regulation SCI to include competing consolidators could raise the barriers to entry for competing consolidators and reduce competition in the competing consolidator market? Why or why not? Please explain in detail.

Yes, to some extent, but SCI should be 'best practices' adopted by everyone.

Question 284

Do you agree that the purchase of consolidated market data from a competing consolidator by the CAT would not have a significant effect on competition among competing consolidators? Why or why not? Please explain in detail.

We have a different view towards CAT. We are believers of RTAP access rather than 'data submission' to whatever "data vault" which golden source may never be achieved or market dynamic already changed by then. If one can truly enhance CAT "analytical" performance, then that vendor should deserve certain competitive edge. We do like to help if given the opportunity.

Question 285

Would the public disclosure of Form CC or the performance metrics risk revealing any trade secrets that could harm competition? Please explain.

Please see our respond to Question 102

Question 286

Do you believe the proposed amendments would have effects on competition that the Commission has not recognized? Please explain in detail.

Our view about competition may be very different from the Commission's analysis, particularly with respect to the role of SAs, see [Table 1](#), [Table 2](#), and the suggested 3 Pillars Model in [Figure 1](#).



Question 287

Do you agree that the proposal would only have a modest impact on capital formation? Why or why not? Please explain in detail.

Yes if the proposal remains as-is. That being said, right course the ship to uphold market integrity and fairness values of public market helps revitalize trust in Wall Street. The public markets shouldn't be a dump ground for private market's exit strategy or 'only' serving the same old issuers without new bloods. Allowing healthy competition between public and private markets would positively booster capital formation in our opinion.

Question 288

Do you believe the proposed amendments would have effects on capital formation that the Commission has not recognized? Please explain in detail.

Please See our respond to Question 287

E. Analysis of Alternatives

Question 289

Should the Commission adopt an alternative approach? Why or why not? What alternatives should the Commission consider? What are the benefits and costs of such an approach? Please explain in detail.

Yes, please see our suggestions and respond to Question 154, as well as our various concerns over the proposed DCM throughout this letter and

Question 76 in particular.

Question 290

Do you agree with the Commission's analysis of the alternative to further increase the content of core data to include the full depth of book and/or all odd-lot quotes? Would additional depth of book information, beyond what is include in the proposal, be valuable? Why or why not? How much larger would consolidated market data be if it included the full depth of book and/or all odd-lots? How much larger than the proposal would the costs of this alternative be for exchanges, competing consolidators, and other market participants? Please provide estimates, if possible.

Everything is desirable, but not everything is beneficial. Even with no disparity in contents for CMD and PP, the adverse consequences for DCM, if without secure synchronization of start-time and requiring SROs to comply with a connectivity ratio threshold, would be similar as what we stated throughout this letter and

Question 76 in particular. Some hard-decisions or reasonable tradeoffs have to be made by the SEC and the industry in midst of this market structure reform.

Question 291

Do you agree with the Commission's analysis of the distributed SIP alternative? Why or why not? Please explain. How would the competitive effects of the distributed SIP alternative compare to the competitive effects of the proposed decentralized consolidated model? As such, how would the benefits of the distributed SIP model compare to the benefits of the decentralized consolidation model? How would the costs of the distributed SIP model compare to the costs of the decentralized consolidation model? How would the distributed SIP model affect aggregate data fees paid by market



participants for market data? How would the distributed SIP model affect the types of products and services available to purchase consolidated data?

We agree with the Commission to turn down the 'distributed SIP alternative' proposal, but we do have a separate 'Single SIP Alternative' counter suggestion. We hope the industry, including the SROs, would keep an open mind to consider.

Question 292

Do you agree with the Commission's analysis of the relative economic effects of the alternative to not extend Regulation SCI to include competing consolidators? Why or why not? Please explain. Would this alternative increase the risk of a competing consolidator experiencing a system disruption? If so, how economically significant would this increase be? Would this alternative lower the barriers to entry for competing consolidators compared to the proposed amendments? Would this alternative result in more new competing consolidators? Would this alternative increase competition among competing consolidators? Would this alternative increase innovation in the competing consolidator market? Would this alternative increase competition between consolidated market data and proprietary depth of book feeds? Please explain and provide estimates if possible.

Extend Reg. SCI or not is majoring in the minors.

Question 293

Do you agree with the Commission's analysis of the relative economic effects of the alternative to require that competing consolidator fees be subject to Commission approval? Why or why not? Please explain. Should the Commission be concerned that the proposal does not require an approval process for competing consolidators' market data fees? What is the risk and how large is that risk? Would the alternative reduce this risk? If so, how economically significant would this reduction be? How burdensome would it be for competing consolidators to have to obtain Commission approval for their fees? Please explain and provide cost estimates if possible.

Given policy maker is not really mandating a "split"²⁸ of Exchanges' trading and data businesses, CCs might merely be Business Process Outsourcing (BPO) vendors of SROs, hence approval process for competing consolidators' market data fees may perceive as an unnecessary burden interfering private commercial practices.

Question 294

Do commenters agree with the Commission's analysis of the alternative to require all disclosures be filed in the EDGAR system using the Inline XBRL format? Why or why not? Please explain in detail. Would the alternative further help market participants evaluate and compare the merits of competing consolidators? Would the alternative promote consistency relative to the proposal? Would the disclosures be more accessible in EDGAR than if they were on the Commission's website or on competing consolidators' websites? Please explain in detail. What are the costs of using EDGAR and the Inline XBRL format relative to the proposal? Please explain and provide estimates if possible.

We are good with XBRL if that is needed. Benchmarking tests would be better than posting any "well-articulated" metrics on website.

Question 295

Do you agree with the Commission's analysis of the relative economic effects of the alternative in which the Commission would prescribe a single format that SROs would use to provide NMS information to competing consolidators and self-aggregators? Why or why not? Please explain. What effects would the Commission prescribing NMS information be provided in a single format have on the costs of SROs, competing consolidators, and self-aggregators? How economically



significant would these effects be? What effects would the alternative have on the latency of consolidated market data compared to aggregated proprietary data feeds? What effects would the alternative have on the timeliness of the data competing consolidators and self-aggregators would receive? Please explain and provide estimates if possible.

“No, not ‘single format’ unless it is our format” might be what most data suppliers would preference. We understand “same format” serve best for FINRA CAT project. Yet, diversities ought to be respected, and it is a matter to analyze data across different formats or the industry had over reliance on structural SQL queries. Saving one’s cost but out of another person’s pocket may not be good. However, it should minimize frictions to switch from one vendor to another. Anyway, we would be delighted if SROs can provide CC using same format, so we can save some extract transform load (ETL) costs. That being said, the SEC should never mandate CCs to use “Same format” for distribution because it will hurt average investors and gives HFTs a permanent advantage (See [Figure 3](#)).

Question 296

Are there other reasonable alternatives for the proposed amendments to Regulation NMS to update the content of the consolidated market data and introduce competition into the distribution of that consolidated market data? If so, please provide additional alternatives and how their costs and benefits, as well as their potential impacts on the promotion of efficiency, competition, and capital formation, would compare to the impact of the proposed amendments.

Please see our suggestions and respond to Question 154. We hope the industry, including the SROs, would keep an open mind to consider.

Question 297

Is the competing consolidator approach necessary to achieve the economic benefits of the proposal related to expanding consolidated market data? Are there alternatives to the decentralized consolidation model with competing consolidators that would achieve the Commission’s objectives at lower cost? If so, how would their costs and benefit compare to the proposed decentralized consolidation model? Please explain and provide estimates if possible.

Again, please see our suggestions and respond to Question 154. We hope the industry, including the SROs, would keep an open mind to consider.