

November 30, 2020

Via Electronic Submission

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

Re: Proposed Amendments to the National Market System Plan Governing the Consolidated Audit Trail to Enhance Data Security (File No. S7-10-20)

Dear Ms. Countryman:

I was asked by the NYSE Group, Inc. and associated SROs to assess the soundness of the economic analysis in the Commission's October 16, 2020 proposed rule on "Amendments to the National Market System Plan Governing the Consolidated Audit Trail to Enhance Data Security." With research support from the Global Economics Group, LLC, I am submitting the following report to the comment file.

Respectfully,

A handwritten signature in black ink, appearing to read "Scott Bauguess". The signature is fluid and cursive, with the first name "Scott" and last name "Bauguess" clearly distinguishable.

Scott Bauguess,
Clinical Associate Professor of Finance, McCombs School of Business, University of Texas at Austin

REVIEW OF THE Economic Analysis for the “Proposed Amendments to the National Market System Plan Governing the Consolidated Audit Trail To Enhance Data Security”

Scott W. Bauguess¹

November 30, 2020

¹ I am a Clinical Associate Professor of Finance at the McCombs School of Business, University of Texas at Austin, and Director for the Program on Financial Market Regulation, Salem Center for Policy. From 2013 to 2019, I was the Securities and Exchange Commission’s Deputy Chief Economist and Deputy Director for the Division of Economic and Risk Analysis.

Executive Summary

For more than a decade I served in various economist roles at the Securities and Exchange Commission (“Commission”). From 2013 until my departure in early 2019, I was the Commission’s Deputy Chief Economist and the Deputy Director of the Division of Economic and Risk Analysis. In 2014 and again in 2017, I served as the Division’s Acting Director.

During my tenure I supervised the economic analyses in Commission rulemakings. After the U.S. Court of Appeals for the District of Columbia Circuit vacated the Commission’s rule on “proxy access” in 2011, in which the court determined that the Commission failed to adequately address the rule’s economic effects, I was part of the Commission’s leadership team that implemented new guidance on economic analysis in rulemaking (“Guidance”).² The Guidance reaffirmed the Commission’s continued commitment to engage in sound, robust economic analysis in its rulemaking, and until my departure was the principle document used to ensure that staff maintained the Commission’s commitment to the investing public.³

I was asked by the NYSE Group, Inc. and associated SROs to assess the soundness of the economic analysis in the Commission’s October 16, 2020 proposed rule on “Amendments to the National Market System Plan Governing the Consolidated Audit Trail to Enhance Data Security” (“Proposal”).⁴ With research support from the Global Economics Group, LLC, I am submitting the following report.

Below is a high-level summary of my findings. My overarching conclusion is that the economic analysis in the Proposal does not adhere to the standards set forth by the Commission’s Guidance and governing statutes regarding what the public should expect as part of the notice and comment rulemaking process. Many of the required elements are simply missing. And discussions of the potential economic impact are myopic, focused mostly on compliance costs that the national securities exchange and national securities association participants (the “Participants”) will face. The economic analysis glosses over the potential market effects from restricting regulatory access and use of the Consolidated Audit Trail (“CAT”) data, which is the primary means by which the Commission proposes to improve data security. This is precisely the type of analysis the Guidance meant to avoid and stands in stark contrast to the substantially more complete economic analyses conducted by the Commission in previous CAT rulemakings.

² *Business Roundtable v. SEC*, 647 F.3d 1144, 1150 (D.C. Cir. 2011); Securities and Exchange Commission, “Current Guidance on Economic Analysis in SEC Rulemakings,” March 15, 2012 available at: https://www.sec.gov/divisions/riskfin/rsfi_guidance_econ_analy_secrulemaking.pdf.

³ On April 17, 2012, SEC Chairman Schapiro testified before Congress that she directed the promulgation of new guidance to improve the economic analysis the SEC employs in rulemaking. See Chairman Mary L. Schapiro, Testimony Concerning Economic Analysis in SEC Rulemaking, April 17, 2012, available at <https://www.sec.gov/news/testimony/2012-ts041712mlshtm>.

⁴ Securities and Exchange Act Release No. 89632 (August 21, 2020), 85 FR 65990 (October 16, 2020).

Overarching Comments:

- The Commission is no longer adhering to the original goals and envisioned benefits of the CAT outlined in the 2012 adoption of the CAT (“CAT Adopting Release”), the April 2016 notice of the CAT NMS Plan (the “Notice”), and the November 2016 order approving the CAT NMS Plan (“CAT NMS Plan” or the “Order”).⁵ The Commission, by way of proposing security enhancements, is engendering a policy shift towards permitting the use of CAT data for market surveillance, but not for market reconstruction or analysis of regulatory decisions.
- The Commission has failed to identify a failure with the existing CAT NMS Plan. Rather than justify the need for more security, the Commission has taken the approach that enhanced security is itself a justification. No attempt is made to estimate the likelihood of a breach, the cost of a breach if one should happen, or the types of breaches that might occur if additional security measures are not taken.
- Many of the proposed measures aim to improve data security by limiting the use of CAT data for regulatory purposes. This approach undermines the regulatory intent of the CAT NMS Plan – to enhance the ability for regulators to oversee securities markets and make them safer. By focusing almost exclusively on security benefits, the Commission has failed to meaningfully address the inherent tradeoff between investor protection and data protection.
- Other proposed measures shift risks but do not eliminate them. Requiring self-regulatory organizations (“SROs”) to move sensitive non-CAT data from their existing secure environments to the proposed secure analytical workspaces (“SAWs”) would generate significant new security risks – the same type of risks the Commission is trying to avoid by restricting the movement of CAT data. Moreover, requiring all SROs to use the same SAW environment creates a single point of focus for bad actors.
- Delegating SRO oversight responsibilities to the Plan Processor is bad governance and anti-competitive.⁶ The Plan Processor serves under contractual oversight of the Participants. One has already been replaced.⁷ The second is a wholly owned subsidiary of FINRA, which is a competitor to SROs in the market for regulatory services.⁸ This creates an overly complicated, ambiguous, and ultimately dangerous governance structure.

⁵ Securities Exchange Act Release No. 67457 (July 18, 2012), 77 FR 45722 (August 1, 2012); Securities Exchange Act Release No. 77724 (April 27, 2016), 81 FR 30614; Securities Exchange Act Release No. 79318 (November 15, 2016), 81 FR 84696, (November 23, 2016).

⁶ The Plan Processor is defined in the CAT NMS Plan as “the Initial Plan Processor or any other Person selected by the Operating Committee pursuant to SEC Rule 613 and Sections 4.3(b)(i) and 6.1, and with regard to the Initial Plan Processor, the Selection Plan, to perform the CAT processing functions required by SEC Rule 613 and set forth in this Agreement.” Order at 84947.

⁷ See Letter from Michael J. Simon, Chair, CAT NMS, LLC Operating Committee, to Brent J. Fields, Secretary, Commission, dated April 9, 2019, available at <https://www.sec.gov/divisions/marketreg/rule613-info-notice-of-plan-processor-selection-040919.pdf>.

⁸ Proposal at 66091. *Id.*

- The Online Targeted Query Tool maximum download of 200,000 records is arbitrary. It doesn't reflect common use scenarios and will unnecessarily impair the ability of CAT data users to perform their regulatory duties.

Comments on Efficiency, Competition, and Capital Formation (“ECCF”):

- The Commission is picking the regulatory solution adopted by the Plan Processor and its parent, FINRA, with respect to the required analytical environment for CAT data. Requiring competitors for regulatory services to abandon their own platforms in favor of the Plan Processor's solutions could further entrench FINRA's position as the dominant provider of regulatory services, thus hindering competition.
- By mandating that all national market exchanges use a SAW environment supported by a single vendor, Amazon Web Services, the Commission is giving economic incentives for an entire industry to migrate to a common vendor solution. This puts the Commission in a position of picking winners and losers in the cloud services industry.
- Prohibiting the use of CAT data for regulatory purposes if it also serves a commercial purpose is not a security enhancement. The Commission believes this will prevent competitive harm to broker-dealers or other market participants. Yet, the Commission offers no discussion of this competition concern in the statutorily required ECCF analysis.
- The Commission says there will be minimal, if any, effects on capital formation from limiting the use of CAT data for regulatory purposes.⁹ Yet, prior Commission rulemakings highlight how integrity of markets, improved investor confidence, and lower costs to capital are the central benefits of regulatory access to CAT data.¹⁰ The academic literature supports this conclusion.
- The Commission takes an overly myopic view of efficiency effects by focusing exclusively on the efficiency with which national securities exchanges and national securities associations perform their regulatory duties. The Commission fails to consider any knock-on market efficiency consequences from less efficient regulatory supervision.

Taken together, these findings show how the Commission has failed to perform the statutorily required analysis of the potential impact of the Proposal on ECCF. Many elements of the cost-benefit analysis are simply missing. Others are incomplete. Overall, the Proposal's economic analysis fails to comply with the Commission's internally established standards on what the public should expect from its economic analyses.

⁹ Proposal at 66092.

¹⁰ *Id.*

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I. Overview of Analysis

What follows is a review of the economic analysis included in the Commission's Proposal to amend the CAT NMS Plan. My analytical approach is straightforward – I compare the Commission's analysis to what is required by statute or otherwise acknowledged by the Commission as a practice it follows to maintain consistency with Executive Orders on regulatory economic analysis that apply to other federal agencies.

As I will show, the Commission's economic analysis fails to adequately perform the statutorily required analysis of the potential impact of the proposed rules on ECCF.¹¹ In some instances, the Commission fails entirely to consider an effect. In other instances, the effects are insufficiently addressed.

The Proposal's economic analysis also fails to comply with the Commission's internally established standards on what the public should expect from its economic analyses. In March 2012, at the direction of former Commission Chairman Schapiro¹², the Division of Risk, Strategy, and Financial Innovation (now Division of Economic and Risk Analysis) and the Office of the General Counsel published the Guidance in response to then-recent court decisions, reports by the U.S. Government Accountability Office and the Commission's Office of Inspector General, and inquiries from Congress about the efficacy of the economic analysis in rulemaking.¹³

The Guidance draws on the principles set forth in the Office of Management and Budget (OMB) Circular A-4, which provides guidance for implementing Executive Order 12866. The Guidance states:

It is widely recognized that the basic elements of a good regulatory economic analysis are: (1) a statement of the need for the proposed action; (2) the definition of a baseline against which to measure the likely economic consequences of the proposed regulation; (3) the identification of alternative regulatory approaches; and (4) an evaluation of the benefits and costs—both quantitative and qualitative—of the proposed action and the main alternatives identified by the analysis.¹⁴

The stated purpose of the Guidance was to ensure that decisions to propose and adopt rules are informed by the best available information about a rule's likely economic consequences and allow the Commission to meaningfully compare the proposed action with reasonable alternatives, including the alternative of not adopting a rule. As I will show in this report, the Commission has not met this standard. As a result, the public is left with an unsupported conclusion that economic analysis is

¹¹ 1996 National Securities Markets Improvement Act of 1996 [H.R. 3005] at 110 STAT. 3424. “Whenever pursuant to this title the Commission is engaged in rulemaking and is required to consider or determine whether an action is necessary or appropriate in the public interest, the Commission shall also consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation.”

¹² See *supra* note 3.

¹³ See *supra* note 2.

¹⁴ Guidance at 4.

meant to avoid – in this case, that the proposed security measures will create net benefits when compared to those originally justified and approved by the Commission.

II. Failure to Identify a Failure

The Commission acknowledged in its Guidance that rules must clearly identify the justification for a proposed action. In explaining the need, the Guidance excerpted a 1993 Executive Order on Regulatory Planning and Review saying:

*Each agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem.*¹⁵

The Proposal does not adhere to this basic requirement. The Commission fails to explain what, specifically, is infirm with the existing security measures, which the Commission approved in its order approving the CAT NMS Plan, indicating that “the extensive, robust security requirements in the adopted [CAT NMS] Plan...provide appropriate, adequate protection for the CAT Data.”¹⁶ To the contrary, the Commission acknowledges that the current data security measures are already stringent, but simply thinks they should be even more so, saying:

*CAT Data reported to and retained in the Central Repository is thus subject to what the Commission believes are stringent security policies, procedures, standards, and controls. Nevertheless, the Commission believes that it can and should take additional steps to further protect the security and confidentiality of CAT Data. Therefore, the Commission proposes to amend the CAT NMS Plan to enhance the security of the CAT and the protections afforded to CAT Data.*¹⁷

Nowhere in the preamble of the Proposal does the Commission explain the public need for additional security measures in the context of existing vulnerabilities or likelihood of a breach. As I highlight below, no attempt is made to estimate the likelihood of a breach, the cost of a breach if one should happen, or even the type of breach that might occur if additional security measures are not taken. Rather than justify the need for more security, the Commission has taken the approach that enhanced security is itself a justification.

At several (five) places in the Proposal, the Commission highlights its belief that efforts should be taken to “minimize the attack surface associated with CAT data” and otherwise “maximize security-driven monitoring” through access and use of CAT data.¹⁸ But the release never explains why additional measures are needed relative to the previously approved measures, which were adopted after years of consultation and deliberation with the Participants and the public. Moreover, the

¹⁵ See EO 12866, 58 FR at 51735 and Guidance at 5. The requirement to identify the problem to be addressed is also implicit in the Administrative Procedures Act’s requirement that federal agencies engage in reasoned decision making and provide adequate justifications for their action. See, e.g., *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

¹⁶ Order at 84877.

¹⁷ Proposal at 65991.

¹⁸ See, e.g., Proposal at 65995.

Commission stated in the Order that “certain provisions of Rule 613 and the CAT NMS Plan appear reasonably designed to mitigate the risk of a security breach.”¹⁹

To be consistent with its Guidance, the Commission should make clear why the existing security measures in the CAT NMS Plan are inadequate, including any developments or shifts in thinking since 2016 that have nullified or altered the arguments the Commission used to justify the CAT NMS Plan. Clearly explaining the infirmity of the existing security measures will enable the public to offer views of support or dissent, and to propose alternatives that may be less costly and offer greater benefits. Taking this step would likewise guide the Commission to take only actions that address demonstrated needs and justify their costs.

III. Economic Baseline – Likelihood and Cost of a Data Breach

Providing an economic baseline against which to evaluate the costs and benefits of a proposed rule is a central tenet of the Commission’s Guidance. Understanding the potential impact of a regulatory change requires a benchmark, which as the Commission states, should be the world as it is before any action is taken (i.e., the status quo):

*The economic consequences of proposed rules (potential costs and benefits including effects on efficiency, competition, and capital formation) should be measured against a baseline, which is the best assessment of how the world would look in the absence of the proposed action.*²⁰

The Proposal is currently missing this baseline requirement. Understanding the merit of the proposed security measures requires an estimate of the incremental benefit of avoiding a breach relative to the security measures under the existing CAT NMS Plan. As the Commission acknowledged in the Notice, estimating the benefit (of avoiding a breach) requires knowing two things: (1) the likelihood of a security breach under current data security standards and (2) the cost of a breach should one occur.²¹ At that time, however, the Commission indicated there was too much uncertainty to make any estimate because a Plan Processor (referred to in the Notice as a ‘bidder’) had not yet been selected, stating:

*However, the Commission notes that the considerable diversity in the potential security approaches of the bidders creates some uncertainty about the effectiveness of the eventual security procedures and hence, the risk of a security breach.*²²

¹⁹ Order at 84852.

²⁰ Guidance at 6; this is also referred to as a “no action” baseline in OMB Circular A-4, which provides guidance to executive agencies on conducting cost-benefit analyses pursuant the implementation of EO 12866. Although the Commission is an independent agency and not directly bound by EO 12866, Commission chairs have committed to Congress and shared publicly that its “existing practices are consistent with those described in the Order” (see <https://www.sec.gov/spotlight/regulatoryreviewcomments.shtml> and discussion at 5 in OIG Report 499 available at https://www.sec.gov/about/offices/oig/reports/audits/2012/rpt499_followupreviewofdf_costbenefitanalyses_508.pdf).

²¹ Notice at 30732.

²² Notice at 30733.

This uncertainty no longer exists. A Plan Processor was selected; and Participants started reporting CAT data in November 2018, followed by large and some small broker-dealers starting in the Summer of 2020.²³ Yet, the Proposal makes no attempt to estimate the expected costs of a breach, and offers only vague language describing the potential economic impact, stating:

Because the costs of a data breach are potentially high and would be borne primarily by investors and CAT Data reporters and because the economic impact of a significant data breach is likely to exceed the costs of measures in the proposed amendments that are designed to prevent such a data breach, the Commission preliminarily believes that to the extent that the likelihood of a data breach is reduced, taking measures that may prevent a data breach is inherently more efficient than remediating the consequences of a data breach after it occurred.²⁴

It is not clear what evidence in the Proposal supports the conclusion that the cost of a breach would likely exceed the costs of the proposed measures. The Commission provides no estimates for the expected cost of a breach, or the types of breaches that might lead to an understanding of which security measures may be most effective in mitigating the expected cost of a breach. Yet, the Commission has the experience and resources to make these estimates, has acknowledged their importance in understanding the merit of CAT security measures, and even has direct experience with incurring a breach itself, as have other government agencies for which reports and evidence are available to analyze.²⁵

The Commission also fails to recognize that a data breach would inflict significant harm on Participants. A breach could engender costs related to private lawsuits stemming from legal liability, regulatory action by the Commission, reputational harm to their business, and impairment of regulatory activities.²⁶ These potential costs provide strong economic incentives to protect sensitive data. Moreover, Participants have significant experience protecting sensitive data and a strong track record of doing so, evidence that these incentives are already in place and working.

The Commission could begin to remedy these oversights by describing the types of breaches the new security measures are designed to prevent. This is necessary to understand where and how potential benefits from the proposed security measures will manifest relative to those defined in the CAT NMS

²³ “FAQs,” FINRA CAT, <https://catnmsplan.com/faq>, accessed October 28, 2020. Securities and Exchange Commission, “Update on the Consolidated Audit Trail: Data Security and Implementation Progress,” August 21, 2020, available at <https://www.sec.gov/news/public-statement/clayton-kimmel-redfearn-nms-cat-2020-08-21>.

²⁴ Proposal at 66091.

²⁵ See Securities and Exchange Commission, “Chairman Clayton Provides Update on Review of 2016 Cyber Intrusion Involving EDGAR System,” October 2, 2017, available at <https://www.sec.gov/news/press-release/2017-186>; and United States Senate, Permanent Subcommittee on Investigations, “Federal Cybersecurity: America’s Data at Risk,” June 25, 2019, available at <https://www.hsgac.senate.gov/imo/media/doc/2019-06-25%20PSI%20Staff%20Report%20-%20Federal%20Cybersecurity%20Updated.pdf>.

²⁶ For a discussion of the corporate impact of a cyber breach see, e.g., Kamiya, S., J. Kang, J. Kim, A. Milidonis, and R. Stulz, Risk Management, Firm Reputation, and the Impact of Successful Cyberattacks on Target Firms,” *Journal of Financial Economics*, forthcoming – a research paper presented to economic staff at the Commission on April 16, 2018. (<https://www.sec.gov/page/dera-seminar-series---academic-seminars>).

Plan. For example, in the Order, the Commission previously described four ways in which it contemplated how a breach could result in a cost. The breach could:

- potentially reveal personally identifiable information (“PII”) of customers;
- leak highly confidential information about trading strategies or positions;
- expose proprietary information about the existence of a significant business relationship with either a counterparty or client, which could reduce business profits; and
- reveal the activities of regulators within the Central Repository, such as data on the queries and processes run on query results, which could compromise regulatory efforts or lead to speculation that could falsely harm the reputation of market participants and investors.²⁷

While the Proposal contains robust discussion of the sensitivity of PII, the sensitivity of other information is only tangentially referenced in the context of the need to provide greater awareness to broker-dealers and investors on the policies governing its usage, e.g.:

*The Commission preliminarily believes that broker-dealers and investors that generate the order and trade activity that is reported to CAT should have some insight on the policies governing usage of CAT Data, particularly due to the sensitivity and importance of CAT Data, which may contain personally identifiable information, trading strategies and other valuable or sensitive information...*²⁸

In the context of a potential breach, there is no mention in the Proposal of non-PII related data breaches. A logical conclusion is that the proposed security measures are aimed solely at PII-related breaches. And if so, then why is it not enough to simply codify the current Commission exemption eliminating PII from the CAT system?²⁹

As discussed in more detail below, if the Commission believes that other types of data breaches are relevant to the CAT system, then it should make clear what they are, and how the purported security enhancements are tied to them, so that the public has a point of reference for commenting on the potential efficacy of the proposed measures.

Importantly, clarifications about the types of breaches need to be incorporated into the baseline discussion in the economic analysis alongside discussion of how prevalent the risks are today, absent the proposed measures. Specifically, the Commission needs to make clear how the current Proposal is tied to its original thinking that led to the approval of the Order, including any market developments that have emerged since then to change its beliefs about the likelihood and cost of a breach. Until this is done, it is not possible to comment on the possible permutations of what the Commission might be thinking as it pertains to the relative costs and benefits of the proposed measures.

²⁷ Order at 84874-75.

²⁸ Proposal at 66060.

²⁹ Proposal at 66015.

IV. Incomplete and Mischaracterized Analysis of Costs and Benefits

The economic analysis contained in the Proposal focuses almost exclusively on the compliance cost estimates of implementing the proposed security measures.³⁰ There is comparatively little discussion of the potential indirect costs of the measures, particularly as it relates to the programmatic intent of the CAT NMS Plan. Moreover, as discussed above, the Commission makes no attempt to quantify, or describe with any level of detail, the potential benefits of the proposed security changes.³¹

A. Failure to Acknowledge Originally Intended Benefits of the CAT

In the order approving the CAT NMS Plan, the Commission reiterated the regulatory objectives set from the adoption of Rule 613 in 2012. At that time, the Commission stated that there would be economic benefits of the CAT from improvements in:

- the analysis and reconstruction of broad-based market events;
- market analysis in support of regulatory decisions;
- and improvements in market surveillance, investigations, and other enforcement activities.³²

In the Proposal, the Commission restates the overarching goal of Rule 613 as follows:

*The goal of Rule 613 was to create a modernized audit trail system that would provide regulators with more timely access to a sufficiently comprehensive set of trading data, thus enabling regulators to more efficiently and effectively reconstruct market events, monitor market behavior, and investigate misconduct.*³³

Notably absent from this description is “market analysis in support of regulatory decisions.”³⁴ Yet it is clear from the CAT Adopting Release that the Commission intended the Participants to use CAT data for regulatory purposes, stating:

*In addition to the surveillance and reconstruction benefits described above, a consolidated audit trail would also significantly improve the ability of regulators to monitor overall market structure, so that both the Commission and the SROs can be better informed in their rulemakings.*³⁵

The Commission’s stealth restatement of the objective of Rule 613 in the preamble of the Proposal is inconsistent with the Notice and Order, where the Commission makes clear the original intent and potential benefits by saying:

³⁰ Proposal at 66073.

³¹ See Part III, above.

³² Order at 84803.

³³ Proposal at 65991.

³⁴ Order at 84803.

³⁵ CAT Adopting Release at 45733.

Regulators perform reconstructions of market events so that they and the public can be informed by an accurate accounting of what happened (and, possibly, why it happened).³⁶

In addition, the improved ability for regulators to generate prompt and complete market reconstructions could provide improved market knowledge, which could assist regulators in conducting retrospective analysis of their rules and pilots.³⁷

As noted in the Adopting Release, the sooner regulators can complete a market reconstruction, the sooner regulators can begin reviewing an event to determine what happened, who was affected and how, if any regulatory responses might be required to address the event, and what shape such responses should take.³⁸

More generally, and in contrast to the CAT Adopting Release, Notice, and Order, the Proposal focuses the discussion of costs and benefits of the proposed actions almost exclusively on surveillance and investigative activities. In only a few places identified in the Proposal (one buried in a footnote) did the Commission acknowledge the loss of the other originally intended benefits, stating:

In the CAT NMS Plan Approval Order, the Commission discussed certain benefits that were likely to result from CAT, including benefits from analysis and reconstruction of market events. To the extent that provisions of the proposed amendments complicate access to CAT Data, prohibit its use for purposes that are both regulatory and commercial, or make use of CAT Data more expensive to regulators, fewer of these benefits may accrue to investors.³⁹

The Commission also believes it is important to prohibit Participants from using CAT Data in situations where use of CAT Data may serve both a surveillance or regulatory purpose, and commercial purpose, and, more specifically prohibit use of CAT Data for economic analyses or market structure analyses in support of rule filings submitted to the Commission pursuant to Section 19(b) of the Exchange Act (“SRO rule filings”) in these instances.⁴⁰

For example, in the wake of a market event, a regulator might perform an analysis of cross-market trading before the event. To the extent that making such an analysis public is a commercial as well as regulatory activity under the proposed amendments, fewer such analyses are likely to be performed.⁴¹

The Commission is attempting to eliminate two of the three regulatory pillars of the current CAT NMS Plan by largely ignoring that they ever existed. As I describe throughout this report, there is no serious discussion by the Commission of the economic impact from eliminating regulatory access to the CAT data, whose benefits the Commission previously touted – in the original CAT Adopting Release, Notice, and Order – as being significant. Overall, the approach by the Commission is consistent with a significant policy shift without public notice.

³⁶ Order at 84803.

³⁷ *Id.*

³⁸ Notice at 30694.

³⁹ Proposal at 66085.

⁴⁰ Proposal at 66045.

⁴¹ Proposal at 66085.

B. Failure to Describe the Incremental Benefits of the Proposed Security Actions

Broadly, the categories of risk mitigating measures that the Commission is proposing fall into four areas:

- removing PII information from CAT and restricting access to customer and account attributes;
- defining the Comprehensive Information Security Program and the Security Working Group;
- restricting permissible computing environments; and
- limiting regulatory access to CAT data.

The proposed security measures within these categories are likely to have differential benefits when considered in isolation compared to when considered collectively. The presence or absence of one security measure may determine the effectiveness or relevance of another, which the Proposal fails to acknowledge or discuss.

Most notably, after removing PII from the CAT system, which diminishes that value of CAT data to potential bad actors, the incremental benefits from the remaining measures in the Proposal are unclear. This is in part due to the Commission's failure to explain how each of the proposed measures are tied to the types of breaches and misuse of CAT data they are intended to address. That the proposed measures may be unnecessary security redundancies is also due the Commission's failure to explain how they add to or improve those already in place.

The current CAT NMS Plan prohibits unsecured connectivity to the CAT system, which would eliminate many types of potential security breaches.⁴² This existing security measure mitigates the risk of cyber intrusion incidents like the Commission experienced in 2016 with the EDGAR system. The current CAT NMS Plan also requires that Customer and Account Information System ("CAIS") data and trade data be stored in separate encrypted systems. So, in the unlikely event of a breach in one system, the potential use of the data is significantly compromised because its value is tied to the data in the other system. This would, for example, mitigate the risk of a data breach allowing the reverse engineering of trading strategies, a point discussed in the Notice and Order but ignored in the Proposal.⁴³ When other existing security measures are also considered, like requiring encryption at rest and policy and procedures for need to know and least privileged access, it is understandable how the Commission previously believed that CAT NMS Plan to have appropriate and adequate protection for the CAT data.

For these reasons it is important for the Commission to outline the types of breaches and potential misuse of data the proposed measures are intended to address that the current CAT NMS Plan does not. More generally, after the Commission granted the SROs' request for exemptive relief from reporting certain PII to the CAT and the creation of the CCID subsystem, which the Commission is

⁴² Broker dealers can connect to the CAT via a machine to machine link, a private line, or a secure connection using two-factor authentication.

⁴³ Notice at 30732 and Order at 84874.

already using in its baseline in the Proposal, the Commission needs to explain the incremental benefits of the additional measures by way of changes to the cost and likelihood of a breach.⁴⁴

As discussed above, the Commission should begin by revisiting the types of incidents contemplated in the Notice and Order, including the reverse engineering of trading strategies, revealing customer PII, exposing business relationships, and reputational harm to market participants and investors if regulatory efforts centered on them were revealed.⁴⁵ The Commission should add to this any considerations or developments since the Order was approved that has influenced its thinking about data security. Then, for each of the relevant categories, the Commission should explain qualitatively and quantitatively where possible, the potential harm (cost) from a breach, the likelihood of a breach based on existing security measures, and how the proposed measures – when considered collectively and incrementally – will change either or both these estimates.

Such an analysis would enable estimates of the expected cost of a breach. Only then can the incremental benefits of the proposed security measures be weighed against the implementation costs, which include the indirect costs of impairing Participants performance of their regulatory duties by limiting their access to CAT data. Because the Commission did not include such an analysis in the Proposal, the public is unable to fully assess and comment on the relative impact of the amendments.

C. Indirect Costs of Proposed Changes on Performance of Regulatory Duties

As highlighted above, in addition to surveillance activity, the Commission previously envisioned that CAT data would be used for a variety of market reconstruction and analysis purposes in support of the regulatory duties performed by Participants.⁴⁶ The economic analysis in the Proposal focuses almost exclusively on the direct compliance cost of the proposed measures and provides no estimate for the indirect costs on Participants from executing their regulatory duties with more difficulty or in some instances, not at all. The Commission otherwise recognizes that the proposed measures may harm Participants in this way, but states without providing any basis, that greater harm will come to investors and CAT data reporters:

While Participants are likely to see reductions in the efficiency with which they perform their regulatory duties, investors and CAT Data reporters, the parties likely to experience the greatest harm in the event of a data breach, directly benefit from improvements to security from the proposed amendments.⁴⁷

This is an embarrassingly inadequate analysis of the potential impact given the variety of event and market analyses the Commission originally envisioned to be performed using CAT data.

Examples of recent market reconstructions include the Commodity Futures Trading Commission (“CFTC”) and SEC’s analysis of the May 6, 2010 “Flash Crash,” analysis of

⁴⁴ See Securities Exchange Act Release No. 88393 (March 17, 2020), 85 FR 16152 (March 20, 2020).

⁴⁵ *Id.*

⁴⁶ See Part IV.A, above.

⁴⁷ Proposal at 66092.

*equity market volatility on August 24, 2015, and the multi-agency report on the U.S. Treasuries market on October 15, 2014.*⁴⁸

*Examples of data-driven market analysis include reports on OTC trading, small capitalization stock trading, the Limit Up-Limit Down Pilot, short selling, and high frequency trading.*⁴⁹

The Commission also originally envisioned that Participants could use CAT data for near real-time market surveillance and inform their rulemaking efforts, stating:

*The Commission believes that the Plan will facilitate regulators' access to more complete, accurate and timely audit trail data. The Plan will also allow for more efficient and effective surveillance and analysis, which will better enable regulators to detect misconduct...*⁵⁰

*In addition to the surveillance and reconstruction benefits described above, a consolidated audit trail would also significantly improve the ability of regulators to monitor overall market structure, so that both the Commission and the SROs can be better informed in their rulemakings.*⁵¹

*When these surveillance efforts identify suspicious trading activity, SROs have a responsibility to open investigations in which they assemble and review additional market data to assess the nature and scope of the potential misconduct. When an SRO detects persistent problems in the market it oversees, it may write new rules for its members to address the problems.*⁵²

Each of these activities can have a profound impact on the well-functioning of markets, and the economic consequence of market issues that Participants are tasked to monitor can be quite large. For example, the 2010 Flash Crash resulted in a temporary swing in market value of \$1 trillion without any fundamental change to the value of securities being traded.⁵³ The equity market volatility events August 24, 2015 and February 5, 2018 are other examples of major market events that Participants are well positioned to analyze and assess in near real time with CAT data under the CAT NMS Plan.⁵⁴

The Commission needs to account for the potential impact of the proposed security measures on Participants' regulatory duties and weigh these costs against any perceived benefits that the security measures may bring.

1. Prohibition of Commercial Use of CAT Data

⁴⁸ Order at 84805.

⁴⁹ *Id.*

⁵⁰ Order at 84727.

⁵¹ CAT Adopting Release at 45733.

⁵² CAT Adopting Release at 45727.

⁵³ Chairman Mary L. Schapiro, "Testimony Concerning the Severe Market Disruption on May 6, 2010," May 11, 2010, available at <https://www.sec.gov/news/testimony/2010/ts051110mls.pdf>.

⁵⁴ Securities and Exchange Commission, "Equity Market Volatility on August 24, 2015," December 2015, available at https://www.sec.gov/marketstructure/research/equity_market_volatility.pdf; and The Wall Street Journal, "Market Volatility Strikes Exchange-Traded Products, Alarming Investors and Regulators," February 12, 2018.

The first area of indirect costs the Commission needs to consider is the proposed rule text change prohibiting commercial use of the CAT data. Since the inception of CAT rulemaking, Participants and the public have understood that CAT data may only be used solely for regulatory purposes except the data that a Participant otherwise reports to the CAT. As the Commission stated in the Notice and reiterated in the Order:

Rule 613(e)(4)(1)(A) states that Participants and the Plan Processor “agree not to use such data for any purpose other than surveillance and regulatory purposes, provided that nothing in this paragraph (e)(4)(i)(A) shall be construed to prevent a plan sponsor from using the data that it reports to the central repository for regulatory, surveillance, commercial, or other purposes as otherwise permitted by applicable law, rule, or regulation.”⁵⁵

The Commission also believes that, pursuant to the CAT NMS Plan, the Participants may not use CAT Data for commercial purposes.⁵⁶

The Proposal would amend the CAT NMS Plan such that Participants:

...may not use CAT Data in such cases where use of CAT Data may serve both a surveillance or regulatory purpose, and a commercial purpose. In any case where use of CAT Data may serve both a surveillance or regulatory purpose, and a commercial purpose (e.g., economic analyses or market structure analyses in support of rule filings submitted to the Commission pursuant to Section 19(b) of the Exchange Act), use of CAT Data is not permitted.⁵⁷

The proposed change suggests some ambiguity in the original language that the Proposal does not make clear. By way of example, the Proposal states:

The Commission believes that SROs may want to use CAT Data for legitimate surveillance and regulatory purposes in conjunction with an SRO rule filing, but many exchange SRO rule filings have at least some commercial component. For example, CAT Data could be used to determine whether or not a particular order type is working as intended or if changes would be beneficial to market participants – however, exchange SROs compete for order flow by offering different types and variations of order types, therefore potential SRO rule filings in this context would not be solely related to surveillance or regulation.⁵⁸

It is important to first note that the proposed change is not primarily directed at CAT system security enhancements, which is ostensibly the purpose of the release. Instead, the proposed measure appears motivated by an industry competition concern.⁵⁹ The Proposal further explains the competitive concern by saying:

⁵⁵ Notice at 30733.

⁵⁶ Order at 84762.

⁵⁷ Proposal at 66103.

⁵⁸ Proposal at 66045.

⁵⁹ Footnote 371 of the Proposal refers to a comment letter dated November 11, 2019 from Kenneth E. Bentsen, Jr., President and CEO, Securities Industry and Financial Markets Association, to the Honorable Jay Clayton, Chairman, Commission (“[t]he Commission should clarify the meaning of the term ‘surveillance and regulatory purposes’ In doing so, the Commission should ensure that the SROs will be clearly prohibited from using CAT Data for any commercial purpose”).

*The Commission believes that prohibiting the use of CAT Data for SRO rule filings with a regulatory and commercial purpose is important because exchange groups are no longer structured as mutual organizations that are owned, for the most part, by SRO members. Today, nearly all exchange SROs are part of publicly-traded exchange groups that are not owned by the SRO members, and, among other things, compete with broker-dealers and each other for market share and order flow.*⁶⁰

However, and strangely, there is no discussion of these concerns in the statutorily required ECCF section of the economic analysis. This is a significant oversight by the Commission, and as such, whatever merit the argument may have, the public has not been put on notice as to what the Commission believes to be the potential impact of the proposed action on market competition.

A more fulsome discussion of the potential competitive effects is important because they may run counter to what the Commission implies. The Commission could begin by recognizing that exchange groups have not been structured as mutual organizations since well before the inception of the CAT NMS Plan.⁶¹ As such, it is not clear why that is now a relevant consideration, particularly given that the Commission originally intended for SROs to have access to each other's order flow, stating in the Order that having CAT data would:

*...better inform SROs and the Commission in rulemakings and assist them in conducting retrospective analysis of their rules and pilots, and how it would allow SROs to examine whether a rule change on another exchange was in the interest of investors and whether to propose a similar rule on their own exchange.*⁶²

Equal access to order flow in this context would serve to promote competition and improve market efficiency by allowing the evaluation and spread of optimal practices across exchanges. In this context, relative to the existing NMS Plan, the proposed amendment could be viewed as anti-competitive, severely undermining the Commission's rationale. And if the Commission believes otherwise, then it should explain its arguments in the ECCF so that the public has an opportunity to comment.

The Commission also argues that there would be a security benefit from this provision by minimizing the use of CAT data, and while it may adversely impact certain market analyses by Participants, it is unlikely that the provision would affect a rule filing. The Proposal states:

*It would additionally help protect the security of CAT Data by limiting the extraction of CAT Data to, as proposed, the minimum amount of data necessary to achieve a specific surveillance or regulatory purpose.*⁶³

In the CAT NMS Plan Approval Order, the Commission discussed certain benefits that were likely to result from CAT, including benefits from analysis and reconstruction of market events. To the extent that provisions of the proposed amendments complicate access to CAT Data,

⁶⁰ Proposal at 66045.

⁶¹ See Securities Exchange Act Release No. 50699 (Nov. 18, 2004), 69 FR 71125, 71132 (Dec. 8, 2004).

⁶² Order at 84835.

⁶³ Proposal at 66045.

*prohibit its use for purposes that are both regulatory and commercial, or make use of CAT Data more expensive to regulators, fewer of these benefits may accrue to investors.*⁶⁴

*While the Plan already prohibits commercial use of CAT Data, it does not specifically prohibit a regulatory use that also serves a non-regulatory purpose...The Commission preliminarily believes that it is unlikely that such a rule filing would be approved or disapproved due to the Participants' inability to support their rule filings with CAT Data because Participants retain the ability to analyze their own in-house data in support of their rule filings, and to provide both quantitative arguments based on that in-house data as well as qualitative arguments that support those rule filings.*⁶⁵

This is an unsatisfying line of reasoning. To begin, it is a gross mischaracterization to suggest that a security enhancement is one that prohibits the use of CAT data for an originally intended purpose – a Participant performing its regulatory duties. This argument, taken to the extreme, would find the greatest benefit from a system that did not collect or make available any regulatory data (*i.e.*, no CAT data at all).

Moreover, to suggest that a Participant's own data should be enough to support a rule filing runs against what the Commission stated in the Notice. At that time, the Commission explained that it intended Participants operating as SROs to have access to CAT data that came from exchanges other than their own, with the aim of bringing parity and improved market efficiency through retrospective analyses, stating:

*In particular, SROs would be able to use order data that is currently not available to examine whether rule changes are in the interest of investors. For example, direct access to consolidated audit trail data that identifies trader types could help an SRO examine whether a new rule improved market quality across the entire market and whether it benefitted retail and institutional investors specifically.*⁶⁶

At present, there is no ambiguity with the intent of the CAT NMS Plan. Participants should have access to all CAT data, and not just their own, for regulatory purposes; and Participants are prohibited from using CAT data for commercial purposes. While this has been well-understood by the public and Participants for over a decade,⁶⁷ the Commission is now suggesting there are competitively harmful activities that entail both a regulatory *and* commercial purpose. However, besides the example of an SRO filing for a new order type that might commercially benefit a Participant, which the Commission previously argued was an appropriate use of CAT data because it would promote the spread of best practices, the Commission has not provided the public with enough detail to understand what such harmful activities would be.

It is also worth noting that this restriction is internally inconsistent with the Commission's expectation that the Participants will provide commercial regulatory services to other Participants

⁶⁴ Proposal at 66085.

⁶⁵ Proposal at 66088.

⁶⁶ Notice at 30696-97.

⁶⁷ See Securities Exchange Act Release No. 62174 (May 26, 2010), 75 FR 32556 (June 8, 2010) at 32609; and 2012 CAT Adopting Release at 45781.

using CAT data through regulatory service agreements (“RSAs”).⁶⁸ Providing an RSA to another Participant would serve both a regulatory and commercial purpose that under the new provision would be prohibited. That is not only anti-competitive, but also a missed opportunity to improve supervisory best practices across Participants. Perhaps this is a simple oversight by the Commission, but one that requires clarification.

The overall result of this provision is uncertainty over the regulatory use of CAT data where none previously existed, which runs the risk of pushing Participants away from using CAT data for all their regulatory duties out of concern for violating the rule, undermining the original intent of the CAT NMS Plan.

More generally, these restrictions on the regulatory use of CAT portends to an unexplained overarching policy shift in the CAT NMS Plan by the Commission. If the Commission believes that certain types of regulatory use of CAT data would inflict competitive harm to broker-dealers or other market participants, then it is incumbent on the Commission to describe them pursuant to its statutory mandate. At present, these proposed restrictions appear to be anti-competitive. Until the Commission further explains the types of regulatory activities these new restrictions intend to cover, why the current restrictions on commercial use are insufficient to cover them, and how the Commission will make a determination that a regulatory analysis also serves a commercial purpose, it is not possible to fully comment on the potential indirect costs to participants and the impact on the efficacy and efficiency of market functions.

2. Mandated Use of Secure Analytical Workspaces

The economic analysis in the Proposal also fails to fully capture the indirect costs of mandating Participants use SAWs for performing their regulatory duties or, in the alternative, choose to subject their systems to the exception process or establish RSAs. Participants have already spent four years developing the CAT, considering computing environments necessary to integrate CAT data into their regulatory programs, and hiring additional staff with specialized expertise pursuant to the CAT NMS Plan requirements to integrate CAT data into their regulatory activities. They have done so in reliance on the Commission’s prior determinations regarding CAT security and importance of Participants having the flexibility to integrate CAT data into existing computing environments. In the Order the Commission stated:

*The Commission believes that ensuring the security and confidentiality of CAT Data is of utmost importance, and also notes the Participants’ recognition that regulators should have flexibility in designing such surveillance systems, including the ability to access and transfer data where necessary and consistent with appropriate data security safeguards.*⁶⁹

The proposed rule would now require a one-size-fits-all approach to using CAT data, pushing Participants to abandon their existing systems and ongoing development work in favor of SAWs designed by the Plan Processor, and monitored for compliance by the Plan Processor. The Participant

⁶⁸ Proposal at 66091.

⁶⁹ Order at 84757.

can alternatively seek an exception to use of the SAW if they subject their design specifications for the non-SAW environment for review by an outside security assessor and the Plan Processor.⁷⁰

Setting aside the compliance costs associated with these new requirements and the large sunk costs of existing development work in environments outside of the contemplated SAWs, there are other costs that the Proposal has not considered by pushing Participants to SAWs.

- a. Use of SAWs shifts risks but does not eliminate them; and in some instances, increases them

For CAT data to be fully usable for regulatory purposes, SROs will need to combine it with other regulatory data from outside the CAT. The SROs may have to migrate non-CAT PII and proprietary third-party data, surveillance programs, investigation records, and case management systems into the SAWs. This means that sensitive and proprietary SRO-specific information, including details of surveillance patterns, code, alerts, and investigations, as well as data needed for surveillance would become part of the CAT system.

This non-CAT data often carries significant proprietary value and has a level of sensitivity that is comparable to the CAT data. Requiring SROs to move it from their existing secure environments to the SAW would generate the same security risks the Commission is trying to avoid by restricting the movement of CAT data. Hence, the Commission's proposal is shifting security risks, and not necessarily reducing them.

The Commission's proposal to shift the oversight responsibility of the Participants' CAT usage and security to the Plan Processor also engenders new risks. Through the Chief Information Security Officer and CAT Chief Compliance Officer, the Plan Processor would be responsible for monitoring Participant SAW design specifications, which would require the Plan Processor to have oversight of the non-CAT data and surveillance tools each Participant moves into the SAW.

This is problematic because the Plan Processor is a private market technology provider and not a regulator. It serves under contractual oversight of the Participants and can be terminated, which has already happened once, and could in the future with or without cause.⁷¹ Giving the Plan Processor monitoring authority over the Participants could confuse and pervert this relationship. In a public company setting, this is equivalent to having a CEO monitor, assess, and exert decision authority over a company director. It would give undue power to the CEO and undermine the essential nature of the corporate organizational form – that CEOs be accountable to a governing body. It would also place undue responsibility on the CEO. At threat of being fired by the Board, the CEO might not have the right incentives to effectively monitor a director, and thus shirk such responsibilities.

At a public company, it is appropriate for shareholders, not the CEO, to monitor directors. For the CAT NMS Plan, the Commission, not the Plan Processor, should oversee SRO activities. The Proposal's competing approach creates an ambiguous and dangerous governance structure. This

⁷⁰ Proposal at 66099.

⁷¹ Order at 84701 and 84958.

danger could be exacerbated due to the current Plan Processor operating as a wholly owned subsidiary of FINRA, a potential competitor to the SROs for regulatory services, which creates a conflict of interest between the Plan Processor and SROs. When combined with the incentives for SROs to port their non-CAT data to the SAWs, this will serve to increase the overall risks of the CAT system. Greater amounts of sensitive data will increase the attack surface and resulting cost of a potential breach, while expanding the security perimeter of an SRO's non-CAT data increases the likelihood that such data will be subject to a breach—all contrary to the Proposal's stated goals.

These are counterproductive outcomes that fail to enhance data security. The Commission's economic analysis fails to consider (1) the increase in risks to SROs as their non-CAT data (including customer and transactional data as well as proprietary surveillance programs) are exposed outside of the SROs' existing security perimeters, (2) the increased security threats to the overall CAT system resulting from importation of non-CAT data to the CAT system, and (3) the implications of the various incentives implied by the proposed governance oversight role of the Plan Processor on the CAT system.

b. Being required to work in two computing environments engenders new risks

Participants who elect to operate in the SAW, but who do not currently use the cloud service provider that will host the SAW, will have to operate in two computing environments. This will create costly redundancies. Participants will have to train staff to operate in both environments; configure tools and systems to run in both environments; and shift work functions and analyses between two environments and navigate system process and compatibility issues. These costs go beyond the incremental cost of adding a new system; they require added skills and additional effort to manage redundancies. The Commission has not sufficiently addressed this issue in the Proposal.

Operating in two computing environments will also engender new risks. Requiring participants to know and operate two sets of security protocols, each designed and configured for a different system, could lead to mix-ups by both information technology and analyst staff. Each cloud environment has similar but different tools and settings. Staff operating across both environments could assume a protocol for one that is otherwise meant for another, resulting in a mistake. Some mistakes could adversely affect the quality of work product. Others might inadvertently create a security risk.

c. The government is picking winners and losers in cloud services

The costs and risks of operating in two environments will create incentives for Participants to shift all operations to just one environment. By pushing Participants to use a SAW environment, overseen by a single vendor, the Commission is putting itself in a position of picking winners and losers in the cloud services industry. As explained in more detail below, this could have significant competitive effects given that the government-mandated incentives are being applied to an entire U.S. industry – national securities exchanges – that represent the lion's share of the world's securities markets.⁷² The

⁷² For example, over 40% of the world's publicly traded equity is listed on U.S. exchanges. Bloomberg L.P., *Bloomberg United States Market Cap as a Percentage of World Market Cap USD*, Bloomberg Terminal, accessed November 13, 2020.

Commission fails to acknowledge this potential economic consequence. In the Proposal, the only competitive effect the Commission addresses is that for regulatory services, a type of service that the Proposal does not even acknowledge it may be eliminating through restrictions on commercial uses of CAT data.

d. Seeking an exception to using the SAW is an illusory choice

Seeking an exception to using the SAW is an illusory choice for Participants for two key reasons. First, Participants would have to open their system security protocols to third parties and the Plan Processor (the wholly owned subsidiary of a potential competitor, FINRA), who are currently outside of a Participant's security perimeter. Greater access and knowledge about a Participant's security protocols necessarily increases the number of potential points of failure that could lead to a breach, thus creating new security risks, which could put sensitive non-CAT data (including non-CAT data that Participants would not otherwise put in the SAW) at risk. Managing these new security risks in addition to the time and expense of retaining and working with a security assessor and the Plan Processor, along with competitive harm of revealing this sensitive information to a potential competitor, renders the exception an untenable choice relative to the suboptimal shift of work to a SAW.

Second, excepted environments leave the Participants without access to the CAIS. As the Commission notes, this could reduce efficiency by forcing Participants to still maintain a minimal SAW in parallel to satisfy regulatory responsibilities.⁷³ Consistent with the explanations above, operating in two environments is less efficient than operating in just one, so requiring a Participant to use a SAW for access to any part of the CAT system effectively forces the Participant to use a SAW for access to all parts of the CAT system.⁷⁴

e. SAWs create a single target for bad actors to focus on

The Proposal would create a single target for bad actors to focus upon. One breach of the standardized SAW environment would permit a hacker to access data not only from the CAT, but also potentially from multiple SROs (who would need to upload significant data into the SAW environment, making the CAT an even more valuable target).

The Proposal does not consider the risks of a one-size-fits-all security design. If all Participants use the same environment and same security designs, it creates commonality such that a failure at one could result in a failure of all. Moreover, this creates a network of knowledge of security protocols and settings at each Participant's SAW, that extends beyond the boundaries of each Participant. In contrast, under the existing CAT NMS Plan, decentralized environments without commonality would increase the effort required for a bad actor to inappropriately assess multiple systems.

f. Security enhancements may not apply to the Commission

⁷³ Proposal at 66093.

⁷⁴ See Part IV.C.2.b and Part IV.C.2.c, above.

The overall CAT security design is no better than its weakest link. Thus, any potential benefits from the Commission's proposed security measures would also depend on whether or to what extent the Commission is subject to the same provisions. This is an issue that is left vague in the Proposal. It remains unclear if the Commission will work in SAWs and what restrictions, if any, Commission staff will have on accessing CAT data and downloading CAT data onto local systems.

This is an important point because the Commission has demonstrated security weaknesses in the recent past, resulting in the hack of sensitive market data. Specifically, hackers exploited software vulnerabilities in the Commission's EDGAR system to access non-public corporate earnings information that was used for illegal insider trading, the type of scenario which could present itself through a data breach of non-public data in the CAT.⁷⁵ Indeed, the purported benefits of the Proposal's security changes likely would not accrue if the Commission's own use were subject to less-stringent security controls.

- g. SAWs will restrict potential future innovation and adaptability of security practices

The CAT's ability to adapt to new technologies or best security practices would be compromised because the SROs and the Plan Processor would be required to petition for a Plan amendment, a cumbersome and time-intensive process. The economic analysis of the Proposal fails to address the potential reduction in innovation of security approaches and how the more rigid standards in the Proposal would impede the CAT system's adaptability to new security standards as they evolve over time – e.g., those related to the use of private lines, geographic limitations, and incorporating the NIST cyber security framework. The Proposal also fails to recognize lost benefits that would come from having a diverse set of security controls implemented by each Participant that the operating committee could learn from to make recommendations that could make CAT environments more secure.

3. Restricting Access to Customer and Account Attributes

There will be additional indirect costs from marginalized surveillance activities related to proposed rules that would not permit Participants to download and use customer and account attributes in their own computing environment. Moreover, programmatic access to this information would require Participants to seek approval through an unnecessarily burdensome exception process, imposing a friction on surveillance activities that could hinder surveillance activities.

The Proposal states:

...the proposed exception process would not permit the Participants to access Customer and Account Attributes data in a non-SAW environment; only transactional data is retrievable

⁷⁵ Securities and Exchange Commission, "Fiscal Year 2019: Agency Financial Report", November 15, 2019, available at: <https://www.sec.gov/files/sec-2019-agency-financial-report-508-11-26-19.pdf>.

through the user-defined direct query or bulk extract tools described by Section 6.10(c)(i)(B) and Appendix D, Section 8.2 of the CAT NMS Plan.⁷⁶

The Commission recognizes that allowing programmatic access to CAIS and CCID data by authorized users potentially will allow Regulatory Staff to be exposed to a greater quantity of Customer and Account Attributes. To the extent that this exposure provides more opportunities for this data to be used inappropriately, this may reduce the confidentiality of CAIS and CCID data. However, the Commission preliminarily believes the Commission authorization step required before programmatic access can be exercised mitigates this risk because the application review process requires documentation establishing the regulatory purpose of the programmatic access, and provides for an approval process based on such access being generally consistent with specific standards that would justify such access.⁷⁷

The proposed restrictions on access to CAT data will severely limit one of the primary and originally intended benefits of the CAT – large scale surveillance and statistical analyses in support of regulatory duties.

To begin, the Commission does not clearly explain what “more opportunities for this data to be used inappropriately” means. While the Commission provides some discussion of what it believes is an appropriate use of CAIS data, this is not the same as explaining how it believes Participants could potentially misuse it.⁷⁸ As such, the Commission is proposing to limit access to important CAT data based on an invisible risk.

Furthermore, Participants already have access to this type of data collected from within their own operating environments, including more sensitive customer (PII) data, which would otherwise no longer be contained in the CAIS. As such, it is not clear what risk there is to a Participant continuing to use this type of data for surveillance and other regulatory purposes.

This is an important issue because customer and account attributes are often key indicators for potential misconduct. Bad actors are often identified by geographical location and proximity to victims, and the relationship among the victims and bad actors.⁷⁹ Hence, systematically linking suspicious trading behaviors from transactional level CAT data with customer and account attributes can lead to the development of powerful misconduct detection methods.

Moreover, indicia of misconduct are often developed through tips and complaints that the Commission and Participants receive, and through investigations and cases that the Commission and Participants pursue. Once these fingerprints of misconduct are identified and understood, they provide a basis for systemic searches of similar misconduct.⁸⁰ To the extent they are related to

⁷⁶ Proposal at 66005-06.

⁷⁷ Proposal at 66085.

⁷⁸ Proposal at 66032.

⁷⁹ See, e.g., Parsons, C. A., J. Sulaeman, and S. Titman, S, 2018, The geography of financial misconduct. The Journal of Finance, 73(5), 2087-2137; and Deason, S., S. Rajgopal, and G. Waymire, 2015, Who Gets Swindled in Ponzi Schemes?. Columbia University working paper.

⁸⁰ Christie, W. G. and P. H. Schultz, 1994, Why do NASDAQ market makers avoid odd-eighth quotes?. The Journal of Finance, 49(5), 1813-1840; and Lie, E., 2005, On the timing of CEO stock option awards. Management Science, 51(5), 802-812.

customer and account attributes, such identification would not be possible using direct query and bulk extract tools.

Rather than impose a rigid framework for an unknown risk, a more efficient approach would be for the Commission to audit Participants' practices and use its oversight authority to address any misuses of CAT data should any be found. Otherwise, the Commission should be clearer on what risk it is trying to mitigate so that the public can assess whether the benefits outweigh the cost of impairing SRO surveillance activities.

4. Maximum Download Limit of Online Targeted Query Tool

Another indirect cost imposed on Participants in the Proposal is an arbitrarily defined limit on the maximum number of records that can be downloaded from the CAT using the Online Targeted Query Tool ("OTQT"), which would place limits on regulatory use of CAT data and impact the efficacy of Participants' market surveillance and monitoring activities. The Commission is proposing to set the limit for the total number of downloadable records per query to 200,000, stating:

The Commission believes that certain limitations and changes are required to prevent the online targeted query tool from being used to circumvent the purposes of the proposed CISP and SAW usage requirements. Specifically, the Commission proposes to amend Appendix D, Section 8.1.1 of the CAT NMS Plan to remove the ability of the Plan Processor to define the maximum number of records that can be downloaded via the online query tool, and instead limit the maximum number of records that can be downloaded via the online targeted query tool to 200,000 records per query request.⁸¹

This marks a departure from the originally envisioned limits to the use of an online query tool, which in the Notice and Order was aimed at issues of technical feasibility in delivering timely results to a user. The Commission provided no indication that query limits should restrict Participant access based on the intended use of the results. To the contrary, the Commission acknowledged that the datasets could be large, with the original CAT NMS Plan stating:

For target search criteria, the minimum acceptable response times will be increments of less than one minute. For the complex queries that either scan large volumes of data (e.g., multiple trade dates) or return large result sets (>1M records), the response time must generally be available within 24 hours of the submission of the request. Regardless of the complexity of the criteria used within the online query tool, any query request for data within one business date of a 12-month period must return results within 3 hours.⁸²

The Commission reiterated this objective of this requirement in the Notice and Order, and the need for the Plan Processor to provide an alternative delivery accommodation when a maximum limit is reached, stating:

The CAT NMS Plan specifies that regulators would be able to query the Central Repository using an online targeted query tool with response times "measured in time increments of less

⁸¹ Proposal at 66013.

⁸² Reference to Appendix D-27 of CAT NMS Plan in Notice at 31108.

than a minute'' for targeted queries and within 24 hours for large or complex queries that either scan large amounts of data or return large result sets (i.e., sets of over 1 million records)⁸³

Result sets that exceed the maximum viewable or download limits must return to users a message informing them of the size of the result set and the option to choose to have the result set returned via an alternate method.⁸⁴

The Proposal justifies continued access to the OTQT for small amounts of data with a 200,000 maximum record limit by stating:

This functionality would allow users to perform their surveillance and regulatory functions within the online targeted query tool, as appropriate, and allow regulatory users to narrow queries to obtain more manageable data sets that are not greater than 200,000 records for download or further analysis.⁸⁵

However, the Commission fails to provide substantive support for why 200,000 is the appropriate limit. That limit would unnecessarily constrain Participants' surveillance activities because, as the Commission recognizes, users would be required to have more technical skills or use a technical intermediary to access data through alternative methods.⁸⁶ The purpose of an easy-to-use interface is precisely the opposite – to enable non-technical staff to perform straightforward analyses without technical assistance.

To that end, many potential uses of CAT data for surveillance purposes entail very simple searches for large amounts of data, which are ideally suited for the OTQT. For example, a market event or episode could require downloading all trades for many securities over a very short period, which could number in the millions of observations. Alternatively, a market manipulation event (e.g. marking the close, order layering and spoofing, and wash sales) may require downloading all trades and orders in a single security over a period that could also entail millions of observations.

The reality is that the CAT Data is enormous in size. For the week ending November 13, 2020, the NYSE exchange group,⁸⁷ which represents approximately 22% of the U.S. equities market volume and 18% of the U.S. options market volume,⁸⁸ reported an average of 16.6 billion records per day to the CAT.⁸⁹ With the proposed record limit, the OTQT would provide very little visibility into CAT data for regulators even at the individual security level. During the same week in November, over 75% of the stocks in the S&P 1500 had more than 200,000 records per day sent to the CAT just from

⁸³ Notice at 30693.

⁸⁴ Order at 85030.

⁸⁵ Proposal at 66014.

⁸⁶ Proposal at 66083.

⁸⁷ New York Stock Exchange LLC, NYSE American LLC, NYSE Arca, Inc., NYSE Chicago, Inc., and NYSE National, Inc.

⁸⁸ Based on data from November 9, 2020 through November 13, 2020. Cboe Global Markets, U.S. Equities Market Volume Summary, available at https://markets.cboe.com/us/equities/market_share/; and Cboe Global Markets, U.S. Options Market Volume Summary, available at https://markets.cboe.com/us/options/market_statistics/.

⁸⁹ These figures are derived from CAT data summarized by the NYSE Group, Inc..

the NYSE exchange group, meaning the simplest searches for activity covering a day of trading for a given symbol would be prevented.⁹⁰ For the typical S&P 500 stock the NYSE exchange group provided 1 million records per day; 200,000 records will often represent less than 30 minutes of trading activity for commonly traded issues once CAT data from all the exchanges is combined, making all but very limited searches for market activity impossible with the OTQT limit.⁹¹

Given the disparity between the proposed limit and size of the CAT data, the OTQT is likely to frustrate users with many failed queries, because until a query is made, it is generally not known how many observations are required. Placing an arbitrary constraint on the maximum number could put a Participant in a position to modify their failed requests based on factors unrelated to a regulatory need. This would diminish the efficacy of surveillance activity if analyses are ultimately based on suboptimal amounts of data – Participants might miss important indicia of misconduct because of this restriction, contrary to the CAT’s original intent.

More generally, the Proposal does not explain how security risks are related to the types of surveillance activities Participants would perform – particularly those that do not entail PII – let alone why 200,000 is the right level to curtail them. Rather than describe a simple permissive activity of the OTQT, the Commission should make clear the types of surveillance activities it believes would circumvent the purposes of the proposed CISP and SAW usage requirements (which I explain elsewhere are themselves questionable). Abandoning the Commission’s original approach of allowing flexibility in the maximum limit depending on technical considerations and expediency requirements requires better motivation than what is currently provided.

V. Economic Considerations of Efficiency, Competition, and Capital Formation

The Proposal does not adequately perform the statutorily required ECCF analysis. As described below, the Proposal too narrowly focuses on the impact of the proposed amendments to the CAT NMS Plan on Participants’ ability to perform their regulatory duties, and fails to address broader impacts on competition outside of the market for regulatory services, or the impact of the measures on market efficiency and capital formation.

A. Impact of the Proposed Amendments on Efficiency

In the Proposal, the Commission acknowledges that use of SAWs could negatively impact the efficiency with which Participants perform regulatory tasks, due to (1) delays in securing programmatic access and (2) forced adherence to the uniform SAW configurations.

The proposed amendments impose some uniformity across SAWs and the Commission preliminarily believes that this uniformity reduces the flexibility of design options for Participants in designing their analytic environments, which may result in more costly or less efficient solutions.

⁹⁰ *Id.* Refinitiv Eikon.

⁹¹ *Id.*

In addition, the Commission preliminarily believes that provisions of the proposed amendments that require regulators to secure Commission approval before exercising programmatic access to the Customer Information Subsystems will impose costs upon regulators. These provisions are likely to delay regulators' access to such data as well, further reducing the efficiency with which regulators perform duties that rely upon programmatic access of Customer Identifying Systems.⁹²

However, there is no discussion of how the proposed amendments could ultimately impact the overall efficiency of securities trading. This omission is surprising given that the Commission recognized in the Order the connection between the ability to perform regulatory duties and the resulting impact on the overall efficiency of the market, stating:

Many of the improvements that would result from CAT could also allow regulators to identify violative activity, such as market manipulation, more quickly and reliably, which could improve market efficiency by deterring market manipulation and identifying and addressing it more quickly and more often when it occurs.⁹³

The contemplated limitations on Participant use of data to perform their regulatory duties, as described in earlier sections, could have a significant adverse impact on the programmatic objectives of the CAT NMS Plan.⁹⁴ For example, the proposed rules would prohibit the use of CAT data for regulatory duties if it were deemed to also serve a commercial purpose, restrict access to customer and account data, and limit downloads through the OTQT relative to what the NMS Plan originally envisioned.

Yet, the Commission concludes that there would be mixed effects on efficiency, with possible gains from standardizing how Participants would perform their regulatory duties, stating:

The Commission anticipates moderate mixed effects on efficiency due to negative effects on the efficiency with which Participants perform their regulatory tasks but positive effects on the efficiency by which the CAT NMS Plan is implemented by Participants by standardizing policies and procedures across Participants and improving efficiencies in how Participants perform some regulatory activities.⁹⁵

The Commission also believes there would be increased efficiency from avoiding a data breach, saying that taking additional security prevention measures is “inherently more efficient” than addressing the costs from a data breach. The Proposal states:

To the extent that the likelihood of a data breach is reduced, the Commission preliminarily believes that taking measures that may prevent a data breach is inherently more efficient than remediating the consequences of a data breach after it has occurred.⁹⁶

And further states:

⁹² Proposal at 66091.

⁹³ Order at 84836.

⁹⁴ See Part IV. C, above.

⁹⁵ Proposal at 66090.

⁹⁶ Proposal at 66091.

While Participants are likely to see reductions in the efficiency with which they perform their regulatory duties, investors and CAT Data reporters, the parties likely to experience the greatest harm in the event of a data breach, directly benefit from improvements to security from the proposed amendments.⁹⁷

It is not clear how the Commission arrives at these conclusions given that, as described earlier, it has made no attempt to estimate the likelihood of a breach, the cost of a breach should one occur, or how the proposed security measures would change these estimates relative to the security measures under the existing CAT NMS Plan. At a more basic level, the Commission has not even explained the categories of breaches that the proposed provisions are intended to address, which it otherwise did in the Notice and Order.⁹⁸

Instead, the Commission's reasoning seems to rest on an unfounded, unidirectional argument that more security is strictly better than less, which runs counter to established literature evaluating the economic cost-benefit trade-offs of cybersecurity – that marginal additional cybersecurity investments for an organization are not guaranteed to lead to greater expected marginal benefits.⁹⁹ Neither in the ECCF nor elsewhere in the Proposal does the Commission attempt to recognize or assess the economic trade-offs to data security efficiency gains.

It is also unlikely that there would be a positive effect on the efficiency by which Participants implement the CAT NMS Plan. Participants have mature analytical and data environments, and these environments are already subject to the strictures of Regulation SCI, the Commission's flagship rule to strengthen the technology infrastructure and resiliency of U.S. securities markets.¹⁰⁰ Moreover, Participants have spent the past four years developing a regulatory approach for use of the CAT data in these environments, and have hired staff and procured specialized expertise to implement their plans. An eleventh-hour change to a one-size-fits-all analytical environment and approach to data security would not only result in sunk costs from abandoned CAT development efforts, but also impose new implementation costs and likely delay full implementation of the CAT.

The Commission's conclusion of moderate to mixed effects on efficiency is simply off the mark, and does not even track its own assessment of the possible negative impacts on efficiency from its proposed data security approach:

To the extent that participants implement the current CAT NMS Plan in a manner that is efficient for them individually, provisions increasing uniformity may reduce efficiency by

⁹⁷ Proposal at 66092.

⁹⁸ See Part III, above.

⁹⁹ Gordon, L. A. and M. P. Loeb, 2002, The economics of information security investment. *ACM Trans. Inform. Systems Secur*, 5(4), 438–457; Wang, J., A. Chaudhury, and H. R. Rao, 2008, Research Note—A Value-at-Risk Approach to Information Security Investment. *Information Systems Research*, 19(1), 106-120; and Ruan, K., 2017, Introducing cybernomics: A unifying economic framework for measuring cyber risk. *Computers & Security*, 65, 77-89.

¹⁰⁰ See 17 CFR § 242.1000; see also Securities Exchange Act Release No. 73639 (November 19, 2014), 79 FR 72251, 72276 (December 5, 2014).

requiring some Participants to abandon decisions that were efficient for them in favor of a potentially less efficient mandated alternative.¹⁰¹

Planned approaches for incorporating CAT Data into regulatory activities that may currently be optimal for a Participant, such as performing most of its regulatory duties in-house, may become more difficult for Participants.¹⁰²

...adapting to the requirements of the proposed amendments may reduce the efficiency with which a Participant can discharge its regulatory duties with staff and infrastructure already in place.¹⁰³

The proposed amendments impose some uniformity across SAWs and the Commission preliminarily believes that this uniformity reduces the flexibility of design options for Participants in designing their analytic environments, which may result in more costly or less efficient solutions.¹⁰⁴

...the Commission preliminarily believes that provisions of the proposed amendments that require regulators to secure Commission approval before exercising programmatic access to the Customer Information Subsystems will impose costs upon regulators. These provisions are likely to delay regulators' access to such data as well, further reducing the efficiency with which regulators perform duties that rely upon programmatic access of Customer Identifying Systems.¹⁰⁵

In fact, the Commission's proposed data security approach would severely limit what regulators can do with CAT data and have a major adverse impact on potential market surveillance and other regulatory activities. This adverse impact is important because, as the academic literature further shows, the efficacy of U.S. financial market regulation has a consequential impact on corporate value. For example, researchers found that foreign firms listed in the U.S. market had a 16.5% greater market value than other firms from the same country not listed in the U.S., and is a benefit explaining why many foreign firms seek U.S. listings.¹⁰⁶ Other research shows similar findings, including increases to firm values when enforcement intensity increases.¹⁰⁷ For the Commission to simply state that any loss from less efficient regulation would be offset by data security gains, without offering any quantitative or qualitative assessment of how these gains will be manifest, is a serious shortcoming of the Proposal.

B. Impact of the Proposed Amendments on Competition

¹⁰¹ Proposal at 66091.

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ Doidge, C., G. A. Karoli, and R. M. Stulz, 2004, Why are Foreign Firms Listed in the US Worth More?. *Journal of Financial Economics*, 71(2), 205-238.

¹⁰⁷ Doidge, C., G. A. Karoli, and R. M. Stulz, 2007, Why do countries matter so much for corporate governance?. *Journal of Financial Economics*, 86(1), 1-39; Silvers, R., 2015, The Valuation Impact of SEC Enforcement Actions on Nontarget Foreign Firms. *Journal of Accounting Research*, 54(1), 187-234.

1. Competition for Regulatory Services

The ECCF discussion of competition in the Proposal consists of only a few paragraphs on the potential impact of the proposed measures on the market for regulatory services (a service that the Commission fails to acknowledge it may be eliminating through restrictions on commercial uses of CAT data). In its discussion the Commission states:

*In the case of the market for regulatory services, the Commission preliminarily believes that competition may increase due to additional Participants seeking out RSAs if the amendments are adopted.*¹⁰⁸

This predicted increase in competition for regulatory services is an odd conclusion given that the Commission otherwise acknowledges that there are high fixed costs such that many participants are already contracting with one dominant provider, FINRA, stating:

*Currently, nearly all the Participants that operate equity and option exchanges contract with FINRA for some or much of their trading surveillance and routine inspections of members' activity. FINRA provides nearly 100% of the cross-market surveillance for equity markets. Within options markets, through RSAs FINRA provides approximately 50% of cross-market surveillance. As a result, the market for regulatory services in the equity and options markets currently has one dominant competitor: FINRA.*¹⁰⁹

Because a FINRA subsidiary was selected as the CAT NMS Plan Processor, the requirement for all Participants to use a SAW provisioned and monitored by the Plan Processor could further entrench FINRA's position as the dominant provider of regulatory services. The Commission is essentially 'picking' the regulatory solution advanced by the Plan Processor and its parent, FINRA, with respect to the required analytical environment for CAT data. The Proposal's competition analysis fails to recognize that the SROs would be faced with a Commission-induced economic incentive to contract with FINRA through RSAs. FINRA already has the analytical solution in place, and the SROs would face a considerable set of risks and costs associated with providing regulatory services relative to FINRA – including the increased risks from importing non-CAT data and surveillance programs into the SAWs, risk from providing access to the Plan Processor to those data and surveillance programs, risks from opening up their security protocols to operate a non-SAW environment, and the expense of building out analytical solutions to work in the SAW.

This is particularly troublesome because one of the originally anticipated benefits of the CAT NMS Plan was the increased ability of the Participants to conduct cross-market surveillance, therefore increasing competition in the market for regulatory services.¹¹⁰ Instead, because of the SAW requirement, there now exists a potential conflict of interest with the Plan Processor serving as the gatekeeper to the national securities exchanges' cross-market surveillance activities while competing against them for those services. Combined with the economic barriers to providing regulatory

¹⁰⁸ Proposal at 66090.

¹⁰⁹ Proposal at 66091.

¹¹⁰ Order at 84887.

services, the result may generate fewer opportunities to innovate in the types of surveillance that are performed, weakening the combined SRO surveillance activity.

For all these reasons, it is difficult to see how, as the Commission concludes, competition for RSA services could increase by creating an environment in which one SRO – FINRA – is able to operate with unmatched authority and without the same expense or risk as the other SROs.

2. Competition between Participants and Broker-Dealers

As discussed above, the Commission's stated motivation for prohibiting the use of CAT data for regulatory purposes if it also serves a commercial purpose is concern over market competition between and among Participants and broker-dealers for market share and order flow.¹¹¹ The consequence of this prohibition is uncertainty over the permissible use of CAT data, which runs the risk of pushing Participants away from using CAT data in their regulatory duties out of concern for violating the rule.

If the Commission believes there to be regulatory activities that also serve a commercial purpose, and that would adversely impact competition between and among Participants and broker-dealers, then it should explain and discuss any adverse impact on competition in the ECCF section of the economic analysis to be consistent with the Commission's statutory requirements and internal guidance. And this discussion should reconcile the Commission's current views with the views it expressed in the Notice and Order, which suggested any effect of competition on broker-dealers' services would be minimal. For example, in the Order the Commission stated:

With regards to competition, the Commission continues to believe that even if regulatory burdens from CAT reduce the number of small broker-dealers in specialized segments, overall competition in those segments may not be harmed.¹¹²

Overall, the Commission continues to believe that the CAT NMS Plan, in aggregate, would likely not reduce competition and efficiency in the overall market for broker-dealer services.¹¹³

As previously discussed, the Commission's problematic example of regulatory activity that also serves a commercial use – an SRO rule filing in the context of new order types – is precisely the type of analysis the Commission originally envisioned SROs would undertake using CAT data. That existing CAT NMS Plan creates a level playing field for SROs to compete for offering the best regulatory services and investor protections, by allowing the evaluation and spread of best practices. In this light, limiting the use of CAT-data for these purposes is anti-competitive.

3. Competition in the Cloud Computing Services Industry

Another area of market competition the Commission failed to address is the potential competitive effects from incentivizing an entire industry – securities market exchange trading – to use a single

¹¹¹ See Part IV.C.1, above.

¹¹² Order at 84887.

¹¹³ *Id.*

cloud service provider. This could have a significant competitive effect on the computing industry by providing economic and regulatory incentives for all national securities exchanges to conform to a single computing environment. As explained in more detail above, having duplicative systems is costly, and if Participants are required to use SAWs created by the Plan Processor, then there will be economic incentives to adopt that platform globally, even if a Participant would otherwise prefer a different or existing solution.¹¹⁴

The Commission acknowledges this effect in its argument for the benefits of forcing all Participants into the same computing environment by stating,

*the Plan Processor is in a position to leverage economies of scale and, possibly, to obtain preferential pricing in establishing SAW accounts with the same cloud provider.*¹¹⁵

However, this is not just an economies of scale argument, as it could also engender large wealth transfers between service providers, putting the U.S. Government in the position of “picking winners and losers.” If all national securities exchanges are migrating to the same computing environment for computing services, it could have knock on effects for other industry players if they realize similar synergies from adopting the same provider. If all SROs are compelled to use the same vendor, then this creates a monopolistic environment for analytical services.

C. Impact of the Proposed Amendments on Capital Formation

Until the Proposal, the Commission regularly made the connection between surveillance improvements coming from the CAT and increases in investor confidence, decreases in investor losses, and reduced violative activity in the market.¹¹⁶ The Commission further envisioned that improved regulatory activities would have follow-on positive impacts through increased investor participation and more efficient allocation of existing capital.¹¹⁷

The Order states:

*Improved surveillance, as well as other regulatory activities, could decrease the rate of violative activity in the market, reducing investor losses due to violative activity. If investors expect fewer losses, this may increase capital formation by facilitating a market where investors could be more likely to mobilize capital into securities markets.*¹¹⁸

This (previous) view by the Commission is well-supported by academic literature. Preventing fraud in misconduct is important to maintain the integrity of capital markets, because when it occurs households are less willing to participate.¹¹⁹ The legal environment – rules and enforcement – matter

¹¹⁴ See Part IV.C.2.b, above.

¹¹⁵ Proposal at 65996.

¹¹⁶ CAT Proposal at 32570-71 and 32595. Order at 84892.

¹¹⁷ Order at 84892.

¹¹⁸ *Id.*

¹¹⁹ Giannetti, M. and T.Y. Wang, 2016, Corporate Scandals and Household Stock Market Participation. *The Journal of Finance*, 71(6), 2591-2636.

for capital market development,¹²⁰ and steps to improve securities regulation have been shown to have significant improvements on market liquidity which has broad impacts on capital formation, such as lower cost of capital.¹²¹ Systems like the CAT are critical because publicly available trade data are often not enough to detect certain types of misconduct like insider trading.¹²²

These are just a few of the papers that discuss the capital market effects of regulation. Many more exist that point to the same conclusions. The Commission hasn't made an effort to cite any in support of their conclusion of no capital formation effects.

Limitations of the proposed amendments on market surveillance including restricting access to CAIS, restricting access to the OTQT, prohibiting regulatory uses if there is also a commercial use, and requiring the Participants work within SAWs, would impair the ability of regulatory staff to perform market assessment and other supervisory functions. The Commission in the Proposal, however, no longer recognizes the impact of a safer market environment from use of CAT data on capital formation, stating:

*Because the proposed amendments concern the security of data used by regulators to reconstruct market events, monitor market behavior, and investigate misconduct, the Commission preliminarily does not anticipate that the proposed rules would encourage or discourage assets being invested in the capital markets and thus do not expect the rules will significantly affect capital formation.*¹²³

This is an unreasonable conclusion. The Commission is proposing to significantly limit the ability of Participants to use CAT data for regulatory purposes, which would systematically diminish the safety and soundness of markets compared to what is possible under the current CAT NMS Plan. Greater investor confidence and participation in markets will lower the cost of capital for issuers of securities. Lower funding costs means that more projects will meet funding hurdles (e.g., generate a sufficiently high internal rate of return to result in a positive net present value),¹²⁴ which, in turn, should result in more capital formation. This line of reasoning is supported not only by the academic literature, but by intuition and common sense, and is the basis for the Commission's tripartite mission.

VI. Failure to Properly Consider Alternatives

According to the Guidance, the Commission should identify reasonable alternatives to its proposed rule and consider the best available quantitative and qualitative costs and benefits of each.¹²⁵ In the

¹²⁰ La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny, 1997, Legal determinants of external finance. *The Journal of Finance*, 52(3), 1131-1150.

¹²¹ Christensen, H. B., L. Hail, and C. Leuz, 2016, Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. *The Review of Financial Studies* 29(11), 2885-2924.

¹²² K. Ahern, 2018, Do Proxies for Informed Trading Measure Informed Trading? Evidence from Illegal Insider Trades. working paper, presented to economic staff at the Commission on October 4, 2018.

¹²³ Proposal at 66092.

¹²⁴ Berk, Jonathan B., and Peter M. DeMarzo. *Corporate Finance*. Pearson Education, 2007, pp. 152-156.

¹²⁵ Guidance at 1.

Proposal, the Commission's analysis of alternatives fails to adequately discuss the alternatives considered, and the Commission should further consider alternatives not addressed.

A. Alternatives Considered in the Proposal

In Proposal, the Commission considered four possible alternatives:

- Private contracting for analytic environments;
- Not allowing for exceptions to the SAW use requirement;
- Alternative download size limits for the OTQT; and
- Allowing access to customer identifying systems from excepted environments.¹²⁶

The brief descriptions of the alternatives provide little insight into what careful analysis might sit behind the Commission's work. For example, in its discussion of the alternative download size limits for the OTQT the Commission simply notes that higher record limits would increase efficiency with the trade-off of increasing attack surface, while a lower record limit would decrease efficiency and attack surface. The same could be said for any alternative number proposed for a record limit. The Commission should consider what the broader range of use cases are for the OTQT and frequency of those regulatory activities.

The Commission provided a similarly insufficient analysis when discussing the risk of allowing access to customer identifying systems from excepted environments. The overarching trade-off is clear – prohibiting customer identifying information in the excepted environments may reduce security (a potential benefit) but decrease efficiency in Participants performing their regulatory duties (a cost). However, the Commission provides no assessment of the degree to which security and efficiency are impacted and ignores the security benefits that would accrue from less non-CAT data being imported out of excepted environments and into the CAT system.

B. Other Alternatives

1. Non-Record-Based Limits to the Online Targeted Query Tool

The requirement that limits the number of records that can be extracted through the OTQT will become more restrictive over time as technology advances and order routing advancements increase the volume of market activity information. A limit on the number of downloadable records risks becoming antiquated and could cause costly future revisits to the threshold.

The requirement also has efficiency impacts. Regulatory users without SQL training and database training would be disadvantaged in obtaining CAT data.¹²⁷ Efficiency declines could present themselves through regulatory users truncating data searches to avoid hitting the limit; and efficiency

¹²⁶ Proposal at 66092-93.

¹²⁷ Proposal at 66083.

may be lost as users first attempt OTQT tool downloads and subsequently discover the required data does not meet the data limit.

The restriction has the potential to impact how thousands of tips and complaints are processed annually. As the Commission noted in the Order, it received around 15,000 submissions to its Tips, Complaints and Referrals (“TCR”) system in the two years leading up to the CAT’s approval - approximately one-third were related to insider trading, manipulation, market events, or other trading and pricing issues; types of events the Commission envisioned the CAT would benefit.¹²⁸ Over the previous two years (FY 2019 and FY 2020) the total number of TCRs grew to 40,500.¹²⁹ Additionally, FINRA receives around 3,000 investor complaints per year.¹³⁰ Both FINRA and the Commission’s complaint forms specifically request the security symbol and dates involved in the event – information that can be easily translated into OTQT searches and used in timely evaluations by regulatory staff.¹³¹

The Commission should consider preserving core situational searches - ad hoc queries to investigate trading by a single trader in all symbols, trading in a single symbol-day, or trading by multiple traders in a single symbol - to remain available to regulatory staff outside of a SAW.

This is an area where the identification of the security risks the Commission is considering when assessing the proposed security measure would aid the discussion of what non-record-based limits would be appropriate.

2. Regulation SCI

Regulation SCI requires that entities essential to the operations of US national market system – SROs, alternative trading systems, plan processors and clearing agencies:

*...establish, maintain and enforce written policies and procedures reasonably designed to ensure that their systems have levels of capacity, integrity, resiliency, availability, and security adequate to maintain their operational capability and promote the maintenance of fair and orderly markets, and operate in a manner that complies with the Exchange Act.*¹³²

Regulation SCI takes a principles-based approach to data security and integrity of the data and systems that underlie the national market system. The Commission should evaluate why it is effective for CAT to go beyond the Commission’s own rules and procedures when addressing data

¹²⁸ Order at 84807 and 84833-34.

¹²⁹ Securities and Exchange Commission, “Division of Enforcement 2020 Annual Report,” November 2, 2020, available at <https://www.sec.gov/files/enforcement-annual-report-2020.pdf>.

¹³⁰ FINRA, “Media Center Statistics,” available at <https://www.finra.org/media-center/statistics>.

¹³¹ FINRA, “FINRA Investor Complaint Form,” available at <https://www.finra.org/investors/have-problem/file-complaint/complaint-center>; and Securities and Exchange Commission, “Tips, Complaints, and Referrals,” available at https://acadia.sec.gov/TcrExternalWeb/faces/pages/intake.jspx?_afLoop=57174915075977&_afWindowMode=0&_adf.ctrl-state=nmusdlkew_29.

¹³² Staff Guidance on Current SCI Industry Standards, Securities and Exchange Commission, November 19, 2014, <https://www.sec.gov/rules/final/2014/staff-guidance-current-sci-industry-standards.pdf>.

security for a Regulation SCI system, and explain if and how Regulation SCI can be modified to address the underlying risks addressed in the Proposal. In particular, and as highlighted above, the Commission should clearly articulate the specific security concerns the proposed measures are intended to address,¹³³ and explain why they cannot be addressed with the existing CAT security framework or through the application of Regulation SCI to the same systems. As currently written, the Proposal does not explain why additional security measures that differ from Regulation SCI are necessary. Additionally, if the Proposal's changes are reasonable and necessary, the Commission hasn't explained why they are not necessary with respect to all other Regulation SCI systems.

A much less costly and more effective way to address security concerns – compared to writing new security rules – would simply entail the Commission conducting examinations of SRO systems, procedures, and compliance under the existing NMS Plan and other applicable rules. Creating a new layer of review and oversight that introduces a private vendor (the Plan Processor and/or security assessor) into the regulatory process is unnecessary. The Commission should clearly explain why regulatory oversight by its staff is insufficient and requires the oversight changes described in the Proposal.

3. Reducing the Sensitivity of Data Collected

Outside of removing PII from CAT, much of the Commission's Proposal focuses on limiting regulator access to the Central Repository under the justification of reducing the likelihood of attack. However, much of the noted attractiveness of the Central Repository comes from the decision of what data to collect in the Central Repository and its near immediate availability.

More could be done by the Commission to reduce the value of the CAT to intruders but retain its value for securities regulatory enforcement and market analysis. The Commission has previously managed data and cybersecurity through assessments of alternatives that would allow Regulators to fulfill their mission through reducing the sensitivity of the data collected. In Form N-PORT rulemaking the Commission determined that the appropriate course of action was to delay funds reporting monthly positions data 60 days after quarter end to reduce its cyber risk profile.¹³⁴

Two of the four costs the Commission considered from a data breach - leaking highly-confidential information about trading strategies or positions and exposing proprietary information about the existence of a significant business relationship – are made more valuable by having current information. As the Commission did with N-PORT data the Commission should consider reducing the sensitivity of the data collected by implementing a delay to when the data is delivered to the CAT, unless a specific investigation or market emergency necessitates delivery.

The Commission should explore these and other alternatives to the amendments described in the Proposal, meaningfully analyze the potential costs and benefits to the CAT relative to the amendments and make the details of such analysis available for public comment.

¹³³ See Part III, above.

¹³⁴ See Securities and Exchange Release No. IC-33384 (February 27, 2019), 84 FR 7980 (March 6, 2019).

VII. Conclusion

The Consolidated Audit Trail is one of the most sophisticated security market plans ever conceived. The collective development effort by the Commission, Participants, and public spans a decade and is unprecedented in longevity and scale. As my report shows, data security has been a central tenet of the plan throughout the process. The CAT Adopting Release, Notice, and Order all detail how the various security concerns were addressed, ultimately to the satisfaction of the Commission.

The Proposal fails to explain why additional data security is needed. Many of the proposed measures are unrelated to data security or otherwise will not enhance it as the Commission suggests. Instead, the proposed measures would severely limit the ability of regulators to use CAT data for market analyses in support of regulatory decision and for the reconstruction of broad-based market events, which are two of the three regulatory pillars of the current CAT NMS Plan. The result is a programmatic shift in the purpose of the CAT NMS Plan that is not centered on security concerns as the Commission claims.

As my report describes in detail, the Commission has not performed its statutorily required analysis of the potential impact of the Proposal on market efficiency, competition, and capital formation. Neither does the Proposal meet the Commission's internally established standards on what the public should expect from its economic analyses. The Commission fails to explain the failure with the existing CAT NMS Plan, and there is no discussion of what led the Commission to change its view on the efficacy of the security measures in the existing CAT NMS Plan. Thus, the Proposal does not adhere to the standards set forth by the Commission's Guidance and governing statutes regarding what the public should expect as part of the notice and comment rulemaking process.