

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-101901; File No. 4-698)

December 12, 2024

Joint Industry Plan; Order Approving Amendments to the National Market System Plan
Governing the Consolidated Audit Trail Designed to Implement Cost Savings Measures

I. Introduction

On March 27, 2024, and pursuant to Section 11A(a)(3) of the Securities Exchange Act of 1934 (the “Exchange Act”)¹ and Rule 608 of Regulation NMS thereunder,² BOX Exchange LLC, Cboe BYX Exchange, Inc., Cboe BZX Exchange, Inc., Cboe C2 Exchange, Inc., Cboe EDGA Exchange, Inc., Cboe EDGX Exchange, Inc., Cboe Exchange, Inc., The Financial Industry Regulatory Authority, Inc., Investors’ Exchange LLC, Long-Term Stock Exchange, Inc., MEMX LLC, Miami International Securities Exchange LLC, MIAX Emerald, LLC, MIAX PEARL, LLC, Nasdaq BX, Inc., Nasdaq GEMX, LLC, Nasdaq ISE, LLC, Nasdaq MRX, LLC, Nasdaq PHLX LLC, The Nasdaq Stock Market LLC, New York Stock Exchange LLC, NYSE American LLC, NYSE Arca, Inc., NYSE Chicago, Inc., and NYSE National, Inc. (“the Participants”) filed with the Securities and Exchange Commission (the “Commission” or the “SEC”) proposed amendments to the national market system plan governing the consolidated audit trail (the “CAT NMS Plan” or “Plan”).³ These proposed amendments (the “Proposal”)

¹ 15 U.S.C 78k-1(a)(3).

² 17 CFR 242.608.

³ In July 2012, the Commission adopted Rule 613 of Regulation NMS, which required the Participants to jointly develop and submit to the Commission a national market system plan to create, implement, and maintain a consolidated audit trail (the “CAT”). See Securities Exchange Act Release No. 67457 (July 18, 2012), 77 FR 45722 (Aug. 1, 2012) (“Rule 613 Adopting Release”); 17 CFR 242.613. On November 15, 2016, the Commission approved the CAT NMS Plan. See Securities Exchange Act Release No. 78318 (Nov. 15, 2016), 81 FR 84696 (Nov. 23, 2016) (“CAT NMS Plan Approval Order”). The CAT NMS Plan is Exhibit A to the CAT NMS Plan Approval Order. See

were designed to implement certain costs saving measures,⁴ including: (A) provisions that would change processing, query, and storage requirements for options market maker quotes in listed options; (B) provisions that would permit the Plan Processor⁵ to move raw unprocessed data and interim operational copies of CAT Data⁶ older than 15 days to what the Participants described as a more cost-effective storage tier; (C) provisions that would permit the Plan Processor to provide an interim CAT-Order-ID⁷ to regulatory users on an “as requested” basis, rather than on a daily

CAT NMS Plan Approval Order, at 84943–85034. The CAT NMS Plan functions as the limited liability company agreement of the jointly owned limited liability company formed under Delaware state law through which the Participants conduct the activities of the CAT (the “Company”). Each Participant is a member of the Company and jointly owns the Company on an equal basis. The Participants submitted to the Commission a proposed amendment to the CAT NMS Plan on August 29, 2019, which they designated as effective on filing. Under the amendment, the limited liability company agreement of a new limited liability company named Consolidated Audit Trail, LLC serves as the CAT NMS Plan, replacing in its entirety the CAT NMS Plan. See Securities Exchange Act Release No. 87149 (Sept. 27, 2019), 84 FR 52905 (Oct. 3, 2019).

⁴ See Letter from Brandon Becker, CAT NMS Plan Operating Committee Chair, to Vanessa Countryman, Secretary, Commission, dated March 27, 2024, available at <https://catnmsplan.com/sites/default/files/2024-03/03.27.24-Proposed-CAT-NMS-Plan-Amendment-Cost-Savings-Amendment.pdf>. MIAX Sapphire, LLC was not a Participant to the CAT NMS Plan when the Proposal was originally filed, but the Participants filed an immediately-effective amendment to the CAT NMS Plan on July 30, 2024 to add MIAX Sapphire, LLC as a Participant. See Securities Exchange Act Release No. 100631 (July 31, 2024), 89 FR 64011 (Aug. 6, 2024).

⁵ The “Plan Processor” is “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.” See CAT NMS Plan, supra note 3, at Section 1.1.

⁶ “CAT Data” is “data derived from Participant Data, Industry Member Data, SIP Data, and such other data as the Operating Committee may designate as ‘CAT Data’ from time to time.” See id.

⁷ The “CAT-Order-ID” is “a unique order identifier or series of unique order identifiers that allows the central repository to efficiently and accurately link all reportable events for an order, and all orders that result from the aggregation or disaggregation of such order.” See 17 CFR 242.613(j)(1); see also CAT NMS Plan, supra note 3, at Section 1.1 (“‘CAT-Order-ID’ has the same meaning provided in SEC Rule 613(j)(1).”).

basis; and (D) provisions that would codify and expand exemptive relief recently provided by the Commission related to certain recordkeeping and data retention requirements for industry testing data.⁸ The Proposal was published for comment in the Federal Register on April 16, 2024.⁹

On July 15, 2024, the Commission instituted proceedings pursuant to Rule 608(b)(2)(i) of Regulation NMS,¹⁰ to determine whether to disapprove the Proposal or to approve the Proposal with any changes or subject to any conditions the Commission deems necessary or appropriate after considering public comment (the “OIP”).¹¹

The Participants subsequently submitted an amendment to their Proposal on September 20, 2024 (the “Amendment”), which, among other things, withdrew the proposed provisions that would have permitted the Plan Processor to provide an interim CAT-Order-ID to regulatory users on an “as requested” basis, rather than on a daily basis.¹² The Amendment was published for comment in the Federal Register on October 7, 2024.¹³ On October 8, 2024, to provide sufficient time to consider the changes set forth in the Amendment and any comments received

⁸ See Securities Exchange Act Release No. 99023 (Nov. 27, 2023), 88 FR 84026 (Dec. 1, 2023) (“Industry Test Data Exemptive Relief Order”).

⁹ See Securities Exchange Act Release No. 99938 (Apr. 10, 2024), 89 FR 26983 (Apr. 16, 2024) (“Notice”). Comments received in response to the Notice can be found on the Commission’s website at <https://www.sec.gov/comments/4-698/4-698-d.htm>.

¹⁰ 17 CFR 242.608(b)(2)(i).

¹¹ See Securities Exchange Act Release No. 100530 (July 15, 2024), 89 FR 58838 (July 19, 2024).

¹² See Letter from Brandon Becker, CAT NMS Plan Operating Committee Chair, to Vanessa Countryman, Secretary, Commission, dated Sept. 20, 2024, available at <https://www.sec.gov/comments/4-698/4698-522995-1501362.pdf>.

¹³ See Securities Exchange Act Release No. 101225 (Oct 1, 2024), 89 FR 81120 (Oct. 7, 2024). Comments received in response to the Amendment can be found on the Commission’s website at <https://www.sec.gov/comments/4-698/4-698-d.htm>.

on the Amendment, the Commission extended the period within which it must conclude its proceedings to December 12, 2024.¹⁴

This order approves the Proposal, as modified by the Amendment (hereinafter, the “Proposal” unless otherwise noted).

II. Description of the Proposal, as Modified by the Amendment

The Commission is approving the proposed changes to the CAT NMS Plan.¹⁵

A. Processing, Query, and Storage Requirements for Options Market Maker Quotes in Listed Options

The Participants proposed to amend the processing, query, and storage requirements that apply to Options Market Maker¹⁶ quotes in Listed Options¹⁷ through the inclusion of a new Section 3.4 in Appendix D of the CAT NMS Plan. Section 6.3(d) of the CAT NMS Plan currently requires each Participant to record and electronically report to the Central Repository¹⁸

¹⁴ See Securities Exchange Act Release No. 101277 (Oct. 8, 2024), 89 FR 83068 (Oct. 15, 2024).

¹⁵ See Notice at note 9, OIP at note 11, and Amendment at note 13 for further description of the changes proposed by the Participants.

¹⁶ An “Options Market Maker” is a “broker-dealer registered with an exchange for the purpose of making markets in options contracts on the exchange.” See CAT NMS Plan, *supra* note 3, at Section 1.1. Each Participant has also promulgated rules for its members that generally govern what constitutes a “market maker quote” and/or “market maker quotation” for that Participant. See, e.g., The Nasdaq Stock Market LLC Rules, Options 2, Section 5, “Market Maker Quotations”; Cboe Exchange, Inc. Rule 5.52, “Market Maker Quotes”; NYSE Arca, Inc. Rule 6.37AP-O, “Market Maker Quotations.”

¹⁷ A “Listed Option” is “any option traded on a registered national securities exchange or automated facility of a national securities association.” See Rule 600(b)(35) of Regulation NMS; see also CAT NMS Plan, *supra* note 3, at Section 1.1. (defining a “Listed Option” as having “the meaning set forth in Rule 600(b)(35) of Regulation NMS.”). Subsequent to approval of the CAT NMS Plan, Rule 600(b)(35) was redesignated as Rule 600(b)(43) without any changes to its terms.

¹⁸ “Central Repository” means “the repository responsible for the receipt, consolidation, and retention of all information reported to the CAT pursuant to SEC Rule 613 and [the CAT NMS Plan.]” See CAT NMS Plan, *supra* note 3, at Section 1.1.

details for all Options Market Maker quotes.¹⁹ With respect to Options Market Maker quotes in Listed Options, Section 6.4(d)(iii) of the CAT NMS Plan states that Reportable Events²⁰ required pursuant to Section 6.3(d)(ii) and (iv) shall be reported to the Central Repository by an Options Exchange in lieu of the reporting of such information by the Options Market Maker.²¹ Section 6.4(d)(iii) of the CAT NMS Plan also requires Options Market Makers to report to an Options Exchange the time at which a quote in a Listed Option is sent to the Options Exchange (and, if applicable, any subsequent quote modifications and/or cancellation time when such modification or cancellation is originated by the Options Market Maker), pursuant to compliance rules established by the Options Exchanges.²² Quote sent time information must be reported to the Central Repository by the Options Exchange in lieu of reporting by the Options Market Maker.²³

The CAT NMS Plan requires all CAT Data reported to the Central Repository to be processed and assembled to create the complete lifecycle of each Reportable Event.²⁴ Appendix D, Section 3 of the CAT NMS Plan states that the Plan Processor must use a “daisy chain approach,” in which a series of unique order identifiers, assigned to all order events handled by CAT Reporters,²⁵ are linked together by the Central Repository and assigned a single CAT-

¹⁹ See Notice, supra note 9, at 26985.

²⁰ A “Reportable Event” includes, but is not limited to, “the original receipt or origination, modification, cancellation, routing, execution (in whole or in part) and allocation of an order, and receipt of a routed order.” See CAT NMS Plan, supra note 3, at Section 1.1.

²¹ See Notice, supra note 9, at 26985.

²² Id.

²³ Id.; see also CAT NMS Plan, supra note 3, at Section 6.4(d)(iii).

²⁴ See Notice, supra note 9, at 26985; see also CAT NMS Plan, supra note 3, at Section 6.5(b)(i) (requiring the Plan Processor to link CAT data).

²⁵ “CAT Reporter” means “each national securities exchange, national securities association and Industry Member that is required to record and report information to the Central

generated CAT-Order-ID that is associated with each individual order event and used to create the complete lifecycle of an order.²⁶ Timelines for data processing and data availability are described in Section 6.1 and Section 6.2 of Appendix D of the CAT NMS Plan.²⁷ The CAT NMS Plan further provides that regulators will have access to processed CAT Data through an online targeted query tool and through user-defined direct queries and bulk extract tools described in Section 8.1 and Section 8.2 of Appendix D of the CAT NMS Plan.²⁸

The Participants proposed to amend the CAT NMS Plan to provide that Options Market Maker quotes in Listed Options will not be subject to any requirement to link and create an order lifecycle, and will not undergo any linkage validation, linkage feedback, or lifecycle enrichment processing, but will undergo ingestion validation.²⁹ The Participants stated that, as described in Section 5.1 (Market Maker Quotes) of the Plan Participant Technical Specifications, there are two types of events used to report Options Market Maker quotes in Listed Options: Option Quote (“OQ”) events, which are used to report a new quote or a quote replacement, and Option Quote Cancel (“OQC”) events, which are used to report when a quote is canceled.³⁰ The Participants also stated that only OQ and/or OQC events would be subject to the amended processing, query,

Repository pursuant to SEC Rule 613(c).” See CAT NMS Plan, supra note 3, at Section 1.1.

²⁶ See also Notice, supra note 9, at 26985.

²⁷ Id.

²⁸ Id. See also CAT NMS Plan, supra note 3, at Section 6.5(c)(ii).

²⁹ See Amendment, supra note 13, at proposed Section 3.4.

³⁰ See id. at 81121; see also CAT Reporting Technical Specifications for Plan Participant v. 4.1.0-r22 (Sept. 10, 2024), at Section 5.1, available at https://catnmsplan.com/sites/default/files/2024-09/9.10.2024-CAT-Reporting_Technical_Specifications_for_Participants_4.1.0-r22.pdf.

and storage requirements.³¹ All other options events³² would continue to be subject to the requirement to link and create an order lifecycle, would continue to undergo linkage validation, linkage feedback, and linkage enrichment processing, and would continue to be available as usual to regulatory users through existing query tools.³³ The Proposal does not alter any of the reporting obligations set forth under the CAT NMS Plan³⁴ including, without limitation, obligations to accurately report OQ and OQC events, obligations related to the reporting of “all Material Terms of the Order” for Options Market Maker quotes or obligations related to the reporting of the time at which a quote in a Listed Option is sent to an Options Exchange.³⁵

While such reporting obligations would not be altered by proposed Section 3.4 of Appendix D, the Proposal alters the Plan Processor’s obligations regarding the processing, query, and storage of Options Market Maker quotes in Listed Options. Specifically, the Plan Processor

³¹ See Amendment, supra note 13, at 81121.

³² See Part III.B, Table 1, Note 1 infra for further description of other options events; see also Letter from Brandon Becker, CAT NMS Plan Operating Committee Chair, to Vanessa Countryman, Secretary, Commission, dated July 8, 2024, at 6-7, available at <https://www.sec.gov/comments/4-698/4698-489583-1406426.pdf> (“Participant Letter”). Additionally, when an Options Market Maker quote is on one side of an “Options Trade” or “OT” event, the Participants explained that the quote side of the OT event will not be linked to the Options Market Maker quote via the linkage process. Rather, a single event lifecycle will be created that contains only the quote side of the OT event. The Participants stated that regulators would be able to “readily identify” the Options Market Maker quote executed in an OT event via the quoteID field on the side of the OT event involving the Options Market Maker quote. In addition, the Participants explained that the side of the OT event that does not involve an Options Market Maker quote would be linked with the relevant order, would include the order lifecycle related to such order, and would be subject to all lifecycle enrichment processing. See Amendment, supra note 13, at 81121.

³³ See, e.g., Participant Letter, supra note 32, at 6-7; Amendment, supra note 13, at 81121.

³⁴ See, e.g., Notice, supra note 9, at 26984.

³⁵ See, e.g., CAT NMS Plan, supra note 3, at Section 6.4(d)(iii); id. at Section 6.3(ii)(G) and (iv)(E).

would be required by proposed Section 3.4 of Appendix D only to ingest and store Options Market Maker quotes in Listed Options.³⁶ Pursuant to proposed Section 3.4 of Appendix D, the Plan Processor would not be required to also link and create an order lifecycle for Options Market Maker quotes in Listed Options, and such data would not undergo any linkage validation, linkage feedback, or lifecycle enrichment processing, although it would undergo ingestion validation.³⁷ Proposed Section 3.4 of Appendix D would state that unlinked data for Options Market Maker quotes in Listed Options would be made available to regulators by T+1 at 12:00 p.m. Eastern Time.³⁸

The Participants clarified the impact of this change by explaining that the following data elements would no longer be available for Options Market Maker quotes in Listed Options under proposed Section 3.4 of Appendix D: Derived Next Event Timestamp/Derived Next Event Epoch Timestamp, CAT Lifecycle Sequence Number, CAT Lifecycle ID (i.e., CAT Order ID and Venue Order ID), and Derived Next Event Type Code.³⁹ In addition, certain processing enrichments, which the Participants characterized as “linkage metadata,” would no longer be

³⁶ See Notice, supra note 9, at 26984.

³⁷ Id. at 26984 n.15; Amendment, supra note 13 at proposed Appendix D, Section 3.4. See also Amendment, supra note 13, at 81121 (citing Appendix B-1 and Appendix B-3 of the CAT Reporting Technical Specifications for Plan Participants, Version 4.1.0-r.21 (Apr. 15, 2024), available at https://www.catnmsplan.com/sites/default/files/2024-04/04.15.2024-CAT_Reporting_Technical_Specifications_for_Participants_4.1.0-r21.pdf, which describe data ingestion error codes and linkage validation error codes). Aside from “linkage validation,” the CAT NMS Plan would continue to obligate the Plan Processor to perform the other kinds of data validation that are required by Section 7.2 of the CAT NMS Plan.

³⁸ See Amendment, supra note 13, at proposed Appendix D, Section 3.4. In addition, the Participants proposed to make conforming changes to certain provisions of Appendix D to include cross-references to proposed Section 3.4. See id. at 81121-22; see also id. at proposed Appendix D, Section 3, Section 6.1, and Section 8.1.1.

³⁹ See id. at 81124.

available under proposed Section 3.4 of Appendix D: Intra Venue Link Status Code, Unlinked Indicator, Lifecycle Assembly Date, and Associated Lifecycles.⁴⁰ Nevertheless, proposed Section 3.4 of Appendix D would require the Plan Processor to provide to regulatory users, upon request, the business and technical requirements needed to re-create the eliminated data elements and/or enrichments, as well as the code the Plan Processor currently uses to derive these eliminated data elements and/or enrichments from the unprocessed Options Market Maker quotes in Listed Options.⁴¹

The CAT NMS Plan currently requires that the Plan Processor provide access to CAT Data to the Participants and the Commission through various query tools, including an online targeted query tool that provides authorized users with the ability to retrieve CAT Data via an online query screen that includes the ability to choose from a variety of pre-defined selection criteria and user-defined direct queries and bulk extracts that provide authorized users with the ability to retrieve CAT Data via a query tool or language that allows users to query all available attributes and data sources.⁴² The online targeted query tool functionality provided by FINRA

⁴⁰ Id. The Participants also explained that the Top Indicator data element would not be affected, because it is not a processing enrichment available on Participant events like Options Market Maker quotes on Listed Options. Id.

⁴¹ Id. According to the Participants, the Plan Processor would not update this code and/or logic following approval of proposed Section 3.4; rather, it would “maintain a copy of each so that they may be provided to any regulators that might request them in the future,” such that regulators would “all receive the same version of the code and/or logic regardless of whether they make their request immediately upon the approval of the [Amendment] or at some point in the future.” See Participant Letter, supra note 32, at 6. However, the Participants stated that the “regulatory groups of each of the Participants have indicated that they do not require these data elements to perform their surveillance and regulatory functions and/or have the capability to derive these data elements themselves.” See Participant Letter, supra note 32, at 6.

⁴² See CAT NMS Plan, supra note 3, at Section 6.10(c); see id. at Appendix D, Section 8.1 and Section 8.2. See also id. at Section 6.5(c)(ii) (requiring the CAT to “allow the ability

CAT, the current Plan Processor, is provided by tools that are sometimes referred to as “DIVER” or “MIRS.” “BDSQL” is the user-defined direct query tool provided by FINRA CAT, and “Direct Read” is the bulk extract tool provided by FINRA CAT.

Under proposed Section 3.4 of Appendix D, Options Market Maker quotes in Listed Options would be accessible through BDSQL and Direct Read interfaces only and would not be accessible through DIVER.⁴³ In addition, the Participants stated that elimination of linkage and feedback processes would remove Options Market Maker quotes in Listed Options from certain DIVER and/or MIRS interfaces: Options Market Replay, OLA Viewer, and All-Related Lifecycle Event queries.⁴⁴ These DIVER and MIRS tools currently enable regulatory users with less expertise in sophisticated programming skills to access CAT Data. BDSQL and Direct Read – which will be the only query tools that still contain Options Market Maker quotes in Listed Options data under the Proposal – require programming skills in remote data processing and/or knowledge of structured query programming language. The Participants explained that the BDSQL and Direct Read interfaces “represent a significantly more cost-efficient method of providing access” to the relevant data,⁴⁵ insofar as the Plan Processor estimated that “the continued optimization of Options Market Maker Quotes to make them available via DIVER would cost approximately \$2.8 million per year.”⁴⁶ The Participants stated that each of their

to return results of queries that are complex in nature, including market reconstruction and the status of order books at varying time intervals).

⁴³ See Amendment, supra note 13, at proposed Appendix D, Section 3.4; see also Participant Letter, supra note 32, at 5.

⁴⁴ See Notice, supra note 9, at 26984.

⁴⁵ See Participant Letter, supra note 32, at 5.

⁴⁶ Id. According to the Participants, this estimate consisted of “approximately (i) \$2.2 million per year in compute costs for producing the DIVER-specific hash partition copy of Options Market Maker Quotes, and (ii) \$600,000 per year in storage costs for one

regulatory groups would be able to conduct their regulatory programs accessing Options Market Maker quotes in Listed Options using only BDSQL and Direct Read and that each regulatory group supported the proposed modification.⁴⁷

The Participants estimated that costs related to creating lifecycles for Options Market Maker quotes in Listed Options were \$30 million in 2023.⁴⁸ However, the Participants acknowledged, in their Proposal, that they had already begun to implement certain measures to reduce the costs associated with lifecycle linkages for Options Market Maker quotes in Listed Options, pursuant to exemptive relief issued by the Commission in November 2023.⁴⁹ The Participants stated that the November 2023 Exemptive Relief Order allows the Plan Processor to create lifecycle linkages for Options Market Maker quotes in Listed Options only once by T+2 at 8 a.m. Eastern Time (as opposed to requiring both an interim lifecycle by T+1 at 9 p.m. Eastern Time and a final lifecycle by T+5 at 8 a.m. Eastern Time).⁵⁰ The Participants stated that they expected the above-described “single pass” approach to generating lifecycles for options quotes to result in annual savings of approximately \$5.4 million upon implementation in April 2024,⁵¹ and the Commission understands that this “single pass” functionality has now been implemented.

year’s worth of DIVER-specific copies of Options Market Maker Quotes.” *Id.* The Participants explained that these costs were included in the larger processing and storage cost estimates described below. *See* Amendment, *supra* note 13, at 88123; *see also* notes 53-57 and associated text *infra*.

⁴⁷ *See* Notice, *supra* note 9, at 26985; *see also* Participant Letter, *supra* note 32, at 5.

⁴⁸ *See* Notice, *supra* note 9, at 26985.

⁴⁹ *See* Securities Exchange Act Release No. 98848 (Nov. 2, 2023), 88 FR 77128 (Nov. 8, 2023) (“November 2023 Exemptive Relief Order”).

⁵⁰ *See* Notice, *supra* note 9, at 26984 n.15 (citing November 2023 Exemptive Relief Order). The Participants stated that the Plan Processor would no longer be required to create any lifecycle linkages for Options Market Maker quotes in Listed Options under their Proposal. *See id.* at 26984.

⁵¹ *Id.* at 26984.

The Participants estimated that the Proposal would result in approximately \$20 million in additional annual cost savings in the first year, such that the cost impact of Options Market Maker quotes in Listed Options on the CAT would be reduced from approximately \$24.4 million (inclusive of anticipated savings resulting from the implementation of the options quotes “single pass” proposal described above) to approximately \$4.0 million annually.⁵²

According to the Participants, approximately \$12 million of these estimated \$20 million in cost savings would be attributable to “linkage processing and data processing reductions, assuming 22 processing days per month for a total of 264 processing days in a year and based on data volumes observed in the first half of 2024.”⁵³ Specifically, the Participants stated that “[l]inkage processing costs would be reduced from approximately \$27,000 per day to \$0 per day, resulting in estimated annual linkage processing savings of \$7,128,000 (\$27,000/day x 264 days). Data processing costs (i.e., costs attributable to data ingestion and preparation and publication of data versions to the relevant regulatory interfaces) would be reduced from approximately \$27,000 per day to \$9,000 per day, resulting in estimated annual data processing savings of \$4,752,000 (\$18,000/day x 264 days).”⁵⁴ The Participants explained that these estimated cost savings could increase if “data volumes continue to increase as they have historically”⁵⁵ The Participants further estimated that approximately \$8 million of the estimated \$20 million in cost savings would be attributable to “the reduction in the storage

⁵² See id. at 26984-85. The Participants stated that their cost savings estimates assumed an approximate 65% reduction in compute runtime associated with options exchange events and an approximate 80% reduction in storage footprint through the elimination of versioned options quote data (e.g., interim, final, DIVER-optimized, OLA copies). See id. at 26985 n.19.

⁵³ See Amendment, supra note 13, at 81123.

⁵⁴ Id.

⁵⁵ Id.

footprint for Options Market Maker Quotes in Listed Options through the elimination of versioned quote data (i.e., T+2 8 am ET, T+5 8 am ET, DIVER and OLA copies).⁵⁶ The Participants explained that this estimate assumed a “reduction of the current production storage footprint of approximately 37.5 petabytes (PB) per month based on the data volumes from the first half of 2024 to approximately 9 PB per month” across various storage tiers.⁵⁷

The Participants stated that one-time implementation costs, which would “generally consist of Plan Processor labor costs associated with coding and software development, as well as any related cloud fees associated with the development, testing and load testing of the proposed changes,” were expected to be “minimal relative to overall cost savings” and explained that such costs “may vary based on various factors, including the details of any requirements in any final amendment approved by the Commission and any changes in labor costs.”⁵⁸ The Participants stated that “[o]ngoing operational costs, other than cloud hosting costs” would not be affected by the proposed amendments.⁵⁹ They also stated that actual future savings could be more or less than their estimates due to changes in a number of variables on which their estimates were based, including “current CAT NMS Plan requirements; reporting by Participants, Industry Members, and market data providers; observed data rates and volumes; current storage and compute pricing discounts, compute reservations, and cost savings plans (i.e., including savings attributable to the daily On-Demand Capacity Reservations and Compute

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Id.

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Id.

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Id.

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Id.

Savings Plan); and associated cloud fees.”⁶⁰ The Participants stated that they believed that “the cost savings estimates and assumptions [were] reasonable and provide[d] an adequate basis for the Commission to evaluate the costs and benefits” of their Proposal.⁶¹

Although the Participants represented that Options Market Maker quotes in Listed Options are the single largest data source for the CAT, comprising approximately 98% of all options exchange events and approximately 75% of all transaction volume stored in the CAT,⁶² the Participants stated the changes set forth in the Proposal would have a limited impact on regulators.⁶³ The Participants stated that regulators would still have access to unlinked Options Market Maker quotes in Listed Options by T+1 at 12:00 p.m. Eastern Time under the Proposal and asserted that regulatory users would be able to derive the currently available data enrichments if needed.⁶⁴ The Participants further stated that “[l]inkage validation is not necessary for Options Market Maker Quotes because the *quoteID* is an effective replacement for tying quotes to trades.”⁶⁵ Since the vast majority of Options Market Maker quotes in Listed Options lifecycles consist of just two events – the quote and its subsequent cancellation – the Participants also explained that the number of Options Market Maker quotes in Listed Options that result in an execution and/or allocation in the first place would be extremely low.⁶⁶ Finally,

⁶⁰ See Participant Letter, supra note 32, at 2; see also Amendment, supra note 13, at 81122-23. “Industry Member” means “a member of a national securities exchange or a member of a national securities association.” See CAT NMS Plan, supra note 3, at Section 1.1.

⁶¹ See Amendment, supra note 13, at 81122-23.

⁶² See Notice, supra note 9, at 26984.

⁶³ Id. at 26984-85.

⁶⁴ Id. at 26984.

⁶⁵ See Participant Letter, supra note 32, at 4.

⁶⁶ See Notice, supra note 9, at 26985.

the Participants stated that their usage data “demonstrates” that Options Market Maker quotes in Listed Options lifecycles are “very rarely accessed by regulators.”⁶⁷

Two commenters were supportive of these aspects of the Proposal.⁶⁸ For example, SIFMA stated that the “enormity of this data set . . . has created costs and challenges far beyond those envisioned when CAT was approved.”⁶⁹ SIFMA explained that the “quote-to-trade ratio in listed options markets is so large that the operational costs of linking quotes to trades is an unreasonable burden” that had not been supported by a cost-benefit analysis.⁷⁰ Moreover, SIFMA stated that “the ratio keeps increasing, with [its] member data showing the most recent peak of 32,000 quotes per trade in the U.S. options market in December 2023,” a ratio that they stated was “nearly 4 times greater than the ratio described” in the CAT NMS Plan Approval

⁶⁷ Id. at 26984.

⁶⁸ See Letter from Howard Meyerson, Managing Director, Financial Information Forum, to Secretary, Commission, dated May 7, 2024, available at <https://www.sec.gov/comments/4-698/4698-467591-1256394.pdf> (“FIF Letter I”); Letter from Ellen Greene, Managing Director, Equities and Options Market Structure, and Joseph Corcoran, Managing Director, Associate General Counsel, The Securities Industry and Financial Markets Association, to Vanessa Countryman, Secretary, Commission, dated May 31, 2024, available at <https://www.sec.gov/comments/4-698/4698-479631-1372454.pdf> (“SIFMA Letter I”); Letter from Howard Meyerson, Managing Director, Financial Information Forum, to Secretary, Commission, dated October 25, 2024, available at <https://www.sec.gov/comments/4-698/4698-534415-1532782.pdf> (“FIF Letter II”); Letter from Ellen Greene, Managing Director, Equities and Options Market Structure, and Joseph Corcoran, Managing Director, Associate General Counsel, The Securities Industry and Financial Markets Association, to Vanessa Countryman, Secretary, Commission, dated October 28, 2024, available at <https://www.sec.gov/comments/4-698/4698-535155-1534962.pdf> (“SIFMA Letter II”). Nasdaq also commented in support of the proposed amendments, reiterating points made by the Participants in their filings and noting the support of SIFMA and FIF. See also Letter from Jeffrey S. Davis, Senior Vice President, Principal Deputy General Counsel, Nasdaq, Inc., to Vanessa A. Countryman, Secretary, Commission, dated July 1, 2024 (“Nasdaq Letter”), available at <https://www.sec.gov/comments/4-698/4698-487351-1391254.pdf>.

⁶⁹ SIFMA Letter I at 1-2; SIFMA Letter II at 1-2.

⁷⁰ SIFMA Letter I at 2-3.

Order.⁷¹ SIFMA further expressed concern that there were no forces to “constrain the increase in this ratio” and asserted that “certain SEC market structure initiatives might only accelerate the increase.”⁷² Given the “extremely small number of quotes” with a “corresponding trade,” SIFMA did not believe it was reasonable to spend so much on processing and storage costs for Options Market Maker quotes in Listed Options, especially if such data would continue to be reported to the CAT and if “the SEC or a Participant can use the quote data as part of its surveillance or investigation patterns, albeit with the need to perform some additional computations.”⁷³ FIF supported the Proposal, but suggested that the Commission go further and eliminate Options Market Maker quotes in Listed Options from the CAT altogether.⁷⁴ FIF also requested that the Commission and the Participants “conduct” and make public “a cost-benefit analysis of maintaining Options Market Maker Quotes in CAT vs. removing them from CAT.”⁷⁵

Rule 608(b)(2) states that the Commission shall approve a proposed amendment to an effective national market system plan, with such changes or subject to such conditions as the Commission may deem necessary or appropriate, if it finds that such amendment is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market

⁷¹ Id. at 2 (citing CAT NMS Plan Approval Order, supra note 3, at 84750).

⁷² Id. For example, SIFMA explained that the Commission’s recent “tick size proposal has the potential to significantly expand the amount of quoting activity in the equities and listed options markets.” Id. at 2 n.7.

⁷³ Id. at 2-3.

⁷⁴ FIF Letter I at 2; FIF Letter II at 2.

⁷⁵ FIF Letter I at 2.

system, or otherwise in furtherance of the purposes of the Exchange Act.⁷⁶ When evaluating the estimated cost savings of approximately \$20 million annually (and potentially more if data volumes continue to increase as they have historically) in light of the reduced functionalities for Options Market Maker quotes in Listed Options,⁷⁷ the Proposal satisfies the approval standard set forth in Rule 608.⁷⁸

In reaching this conclusion, the Commission emphasizes several important considerations. The Proposal would preserve some of the functionality that would have otherwise been available to regulators with respect to Options Market Maker quotes in Listed Options, and the Commission continues to believe that such data has substantial regulatory value.⁷⁹ Specifically, under proposed Section 3.4 of Appendix D, regulators would still have

⁷⁶ 17 CFR 242.608(b)(2). See also 15 U.S.C. 78k-1 (authorizing the Commission, by rule or order, to authorize or require the self-regulatory organizations to act jointly with respect to matters as to which they share authority under the Exchange Act in planning, developing, operating, or regulating a facility of the national market system).

⁷⁷ See Amendment, supra note 13, at 81122-23. See also notes 53-57 and associated text supra.

⁷⁸ The Commission recognizes that there are additional measures beyond the specific amendments proposed by the Participants here that could further reduce CAT costs or could identify areas for potential additional cost savings, such as FIF's suggestions that Options Market Maker quotes in Listed Options be eliminated from the CAT altogether and/or that the Commission and the Participants should conduct a separate "cost-benefit analysis of maintaining Options Market Maker Quotes in CAT vs. removing them from CAT." See notes 74-75 and associated text supra. But, in our view, it is appropriate to proceed with the Participants' Proposal at this time. Approval of proposed Section 3.4 of Appendix D advances FIF's stated goal to "manage and reduce CAT operating costs," FIF Letter I at 2, and does not foreclose the Commission's or the Participants' ability to consider additional cost savings opportunities in the future. Nor does the existence of such additional measures or potential analyses call into question the proposed amendments' satisfaction of the approval standard set forth by Rule 608(b)(2) or otherwise warrant a departure from the policy choices proposed by the Participants.

⁷⁹ Although the Participants have represented that usage data "demonstrates that such data is very rarely accessed by regulators," see Notice, supra note 9, at 26984, such usage data was obtained before the Participants represented to the Commission that CAT

direct access to unlinked Options Market Maker quotes in Listed Options by T+1 at 12:00 p.m. Eastern Time.⁸⁰ Regulators would also still be able to use two of the existing query tools – BDSQL and Direct Read – to access the relevant data, although access to this data through DIVER and certain MIRS interfaces would be eliminated.⁸¹

The Commission further understands that proposed Section 3.4 of Appendix D would also require the Plan Processor to provide regulators, on request, with the business and technical requirements needed to re-create data elements and/or enrichments that would otherwise be eliminated for Options Market Maker quotes in Listed Options, as well as the code currently used by the Plan Processor to derive those data elements and/or enrichments.⁸² It may be feasible for regulators to perform such ad hoc processing of Options Market Maker Quotes in Listed Options, if they have adequate staff possessing the necessary specialized skills for this work and access to the necessary technical tools. In part, this is because lifecycles for Options Market Maker quotes in Listed Options data are generally less complex compared to lifecycles that include other CAT events, in that Options Market Maker quotes in Listed Options lifecycles usually involve only a single broker-dealer, a single exchange, an exchange quote, and a single cancel or trade event.⁸³ At the same time, ad hoc processing would likely require technical assistance from the Plan Processor and would impose costs on the regulator. The magnitude of

implementation was complete and does not reflect current usage patterns. Such data is therefore not dispositive evidence of the lack of regulatory need. See CAT Q2 & Q3 2024 Quarterly Progress Report, available at https://catnmsplan.com/sites/default/files/2024-07/CAT_Q2-and-Q3-2024-QPR.pdf.

⁸⁰ See Amendment, supra note 13, at proposed Section 3.4.

⁸¹ Id.

⁸² See id.

⁸³ See, e.g., Part III.B infra.

this cost depends on the complexity of revising the code for regulators’ systems, the frequency of updates required to maintain the code, and the chosen amount and frequency of data processed. Finally, the CAT NMS Plan will continue to obligate Participants to “adopt policies and procedures, including standards, requiring CAT Data reported to the Central Repository [to] be timely, accurate, and complete, and to ensure the integrity of such CAT Data (e.g., that such CAT Data has not been altered and remains reliable),”⁸⁴ and each Participant’s rulebook obligates its members to record and report CAT data in a manner that ensures its timeliness, accuracy, integrity and completeness.⁸⁵

B. Storage for Raw Unprocessed Data, Interim Operational Data, and/or Submission and Feedback Files Older Than 15 Days

The CAT NMS Plan requires CAT Data to be “directly available and searchable electronically without manual intervention for at least six years”⁸⁶ and within certain query tool response times.⁸⁷ These requirements apply not only to the final corrected data version that is delivered to regulators by T+5 at 8 a.m. Eastern Time, but also to raw unprocessed data and

⁸⁴ See CAT NMS Plan, supra note 3, at Section 6.5(d)(ii).

⁸⁵ See, e.g., Nasdaq General Equity and Options Rule 7, Section 11(a) (“Industry Members are required to record and report data to the Central Repository as required by this General 7 in a manner that ensures the timeliness, accuracy, integrity and completeness of such data.”); Cboe Rule 7.30(a) (“Industry Members are required to record and report data to the Central Repository as required by this Section B in a manner that ensures the timeliness, accuracy, integrity and completeness of such data.”); NYSE Rule 6893(a) (“Industry Members are required to record and report data to the Central Repository as required by this Rule Series in a manner that ensures the timeliness, accuracy, integrity and completeness of such data.”).

⁸⁶ See CAT NMS Plan, supra note 3, at Section 6.5(b)(i) and Appendix D, Section 1.4.

⁸⁷ See, e.g., CAT NMS Plan, supra note 3, at Appendix D, Section 8.1 and 8.2. The Participants explained that the Commission had granted conditional exemptive relief from certain performance requirements related to the online targeted query tool. See Notice, supra note 9, at 26986; see also November 2023 Exemptive Relief Order, supra note 49.

various types of interim operational data, as well as to copies of all submission and feedback files provided to CAT Reporters as part of the correction process.⁸⁸ Specifically, with respect to raw unprocessed data and interim operational copies of data created between T+1 and T+5, Section 6.2 of Appendix D of the CAT NMS Plan provides that, prior to 12:00 p.m. Eastern Time on T+1, raw unprocessed data that has been ingested by the Plan Processor must be available to Participants' regulatory staff and the SEC, and between 12:00 p.m. Eastern Time on T+1 and T+5, access to all iterations of processed data must be available to Participants' regulatory staff and the SEC.⁸⁹

The Participants distinguish between Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files in the Amendment, which would define Raw Unprocessed Data as “data that has been ingested by the Plan Processor and made available to regulators prior to 12:00 p.m. Eastern Time on T+1.”⁹⁰ Interim Operational Data, on the other hand, would be defined as “all processed, validated and unlinked data made available to regulators by T+1 at 12:00 p.m. ET and all iterations of processed data made available to regulators between T+1 and T+5, but excludes the final version of corrected data that is made available at T+5 at 8:00 a.m. ET.”⁹¹ Currently, the Participants explained that such data is supplanted in all CAT query tools by the final version of corrected data that is made available to regulators at T+5 at 8:00 a.m.

⁸⁸ See Notice, supra note 9, at 26986.

⁸⁹ CAT NMS Plan, supra note 3, at Appendix D, Section 6.2.

⁹⁰ See Amendment, supra note 13, at proposed Section 6.3.

⁹¹ Id. The Commission understands, from Staff discussions with the Participants, that Options Market Maker quotes in Listed Options would not qualify as Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files, and this Order does not approve application of proposed Section 6.3 of Appendix D to Options Market Maker quotes in Listed Options. See, e.g., id. (stating that “Interim Operational Data” does not include “processed data relating to Options Market Maker quotes in Listed Options made available to regulators by T+1 at 12:00 p.m. ET”).

Eastern Time.⁹² The Participants stated, however, that such data remains available to regulators after T+5 “without manual intervention” via the use of CAT data management APIs.⁹³

To enable such access, Raw Unprocessed Data, Interim Operational Data, and submission and feedback files are stored in S3 Intelligent Tiers provided by the cloud service provider that currently hosts the CAT System, Amazon Web Services (“AWS”).⁹⁴ Data files that are either new or that have been recently read by a regulatory user are stored in the S3 Frequent Access tier.⁹⁵ Files that have not been read by a regulatory user for 30 days are moved to the S3 Infrequent Access tier.⁹⁶ Files that have not been read by a regulatory user for 90 days are moved to the S3 Archive Instant Access tier.⁹⁷ Once a regulatory user accesses an older file, it is moved back into the S3 Frequent Access tier.⁹⁸

The Participants stated that regulatory users generally access the latest, corrected version of CAT data⁹⁹ and therefore stated that Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files generally do not provide any regulatory value after the final

⁹² See Notice, supra note 9, at 26986.

⁹³ Id.

⁹⁴ See Participant Letter, supra note 32, at 3-4.

⁹⁵ See Amendment, supra note 13, at 81122 n.18.

⁹⁶ Id.

⁹⁷ Id.

⁹⁸ See Participant Letter, supra note 32, at 3.

⁹⁹ When a regulator queries CAT Data, the Participants explained that the CAT currently provides results to the user based on the latest, most current version of the data. Between T+1 and T+5, the CAT query tools will return the latest iteration of processed data available, and any interim data versions are ultimately supplanted in all CAT query tools by the final version of corrected data that is made available at T+5 at 8:00 a.m. ET. See Amendment, supra note 13, at 81123.

corrected data is delivered by T+5 at 8 a.m. Eastern Time.¹⁰⁰ The Participants asserted that cost savings could be achieved by archiving Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files older than 15 days to a more cost-effective storage tier that is optimized for infrequent access.

Specifically, the Participants proposed to add new Section 6.3 to Appendix D of the CAT NMS Plan that would state that Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files older than 15 days may be retained in an archive storage tier that would not be directly available and searchable electronically without manual intervention and that would not be subject to any query tool performance requirements until it is restored to an accessible storage tier.¹⁰¹ The Participants stated that Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files not older than 15 days, as well as all final, corrected data, would remain accessible “without manual intervention” within required query tool response times.¹⁰²

Proposed Section 6.3 of Appendix D would also state that the Plan Processor would restore archived data to an accessible storage tier upon request to the CAT Help Desk by an authorized regulatory user from the Participants or a senior officer from the Commission.¹⁰³ The

¹⁰⁰ See Notice, supra note 9, 26986; see also Amendment, supra note 13, at 81122. According to the Participants, after four years of operation, the Plan Processor has not seen any regulatory usage of this interim operational data. See Notice, supra note 9, 26986; see also Amendment, supra note 13, at 81123.

¹⁰¹ See Amendment, supra note 13, at proposed Section 6.3. The Participants anticipated that “archived data would be restored to the S3 Frequent Access tier,” but cautioned that “[s]torage tiers are subject to change based on future technology developments and product offerings.” See id. at 81122 n.18.

¹⁰² See Notice, supra note 9, at 26986.

¹⁰³ See Amendment, supra note 13, at proposed Section 6.3. In addition, the Participants proposed to add references to proposed Section 6.3 of Appendix D to Section 6.5(d)(i) and Section 1.4 of Appendix D of the CAT NMS Plan. See id. at 81122.

Participants explained that archived data would be restored generally within several hours or business days of a request to the CAT Help Desk that is maintained pursuant to Section 10.3 of Appendix D of the CAT NMS Plan, depending on the volume and size of the date range of the requested data restore. For example, they stated that a request to restore a single day of data may take less than 24 hours, whereas a request to restore a year's worth of data may take several days.¹⁰⁴ The Participants further represented that the Plan Processor would develop policies and procedures to ensure the confidentiality of any regulator requests to obtain data subject to proposed Section 6.3 of Appendix D.¹⁰⁵

Accordingly, the Participants stated that they believed that the anticipated savings associated with optimizing storage costs, which they estimated as approximately \$1 million in annual costs, outweighed the impact on regulatory access to this data.¹⁰⁶ The Participants reached their estimate by calculating the savings that would result from moving Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files from the S3 Frequent Access tier to the Glacier Deep Archive tier, "based on data volumes observed in the

¹⁰⁴ See Notice, supra note 9, at 26986. By contrast, the Participants stated that, when the Commission adopted the CAT NMS Plan, "[m]ost current data sources do not provide direct access to most regulators, and data requests can take as long as weeks or even months to process." See id. (citing CAT NMS Plan Approval Order, supra note 3, at 84833 and Rule 613 Adopting Release, supra note 3, at 45729).

¹⁰⁵ Id.

¹⁰⁶ Id. The Participants stated that their Proposal, as revised by the Amendment, would not delete the data subject to proposed Section 6.3 of Appendix D, but simply move it to a "more cost-effective" storage tier requiring some "manual intervention." Upon restoration to an accessible storage tier, the Participants stated that the relevant data would be "available and searchable electronically . . . in the same manner as it is today." See Amendment supra note 13, at 81123-24.

first half of 2024.”¹⁰⁷ The Participants stated that one-time implementation costs, which would “generally consist of Plan Processor labor costs associated with coding and software development, as well as any related cloud fees associated with the development, testing and load testing of the proposed changes,” were expected to be “minimal relative to overall cost savings” and explained that such costs “may vary based on various factors, including the details of any requirements in any final amendment approved by the Commission and any changes in labor costs.”¹⁰⁸ The Participants stated that “[o]ngoing operational costs, other than cloud hosting costs” would not be affected by the proposed amendments.¹⁰⁹ They also stated that actual future savings could be more or less than their estimates due to changes in a number of variables on which their estimates were based, including “current CAT NMS Plan requirements; reporting by Participants, Industry Members, and market data providers; observed data rates and volumes; current storage and compute pricing discounts, compute reservations, and cost savings plans (*i.e.*, including savings attributable to the daily On-Demand Capacity Reservations and Compute Savings Plan); and associated cloud fees.”¹¹⁰ The Participants stated that they believed that “the cost savings estimates and assumptions [were] reasonable and provide[d] an adequate basis for the Commission to evaluate the costs and benefits” of their Proposal.¹¹¹

¹⁰⁷ See Amendment, supra, note 13, at 81123. The Participants further explained that the “affected data currently represents approximately 52% of the daily storage footprint in CAT. Specifically, raw unprocessed data (*i.e.*, as-submitted data) represents approximately 16% of the daily storage footprint, and interim operational copies (*i.e.*, T+1 12 pm ET, T+1 9 pm T, and associated DIVER copies) represent approximately 36% of the daily storage footprint.” See id. at 81123 n.27.

¹⁰⁸ Id. at 81123.

¹⁰⁹ Id.

¹¹⁰ See Participant Letter, supra note 32, at 2; see also Amendment, supra note 13, at 81122-23.

¹¹¹ See Amendment, supra note 13, at 81122-23.

Both commenters supported this aspect of the Proposal.¹¹² SIFMA further urged the Commission to consider “whether its recordkeeping requirements are appropriate” and to “embark on a more comprehensive undertaking about what other data can be moved to more cost-effective storage solutions.”¹¹³ FIF suggested that, “[i]f the Operational Data does not provide any value to CAT Reporters¹¹⁴ or to regulators after T+5, there is no reason to store this data after T+5.”¹¹⁵ Conversely, if the Commission and the Participants issued a public report that “explains the regulatory value of maintaining this Operational Data,” FIF stated that it would “agree with the proposal . . . to move the Operational Data to a more cost-effective storage tier.”¹¹⁶ FIF further requested that the Commission and the Participants “publish an analysis as to whether this data could be stored in tiers within AWS S3, such as Glacier or Glacier Deep Archive, that could be more cost effective than the AWS S3 Intelligent Tier, as proposed in the Participant filing.”¹¹⁷ In addition, FIF stated that “enhanced transparency regarding the operation of the CAT system is necessary and appropriate” and expressed concern that “there could be other requirements that the Commission is imposing on the . . . Participants that either

¹¹² FIF Letter I at 3; SIFMA Letter I at 3. See also Nasdaq Letter (reiterating points made by the Participants in their filings and noting the support of SIFMA and FIF).

¹¹³ SIFMA Letter I at 3.

¹¹⁴ “CAT Reporter” means “each national securities exchange, national securities association and Industry Member that is required to record and report information to the Central Repository pursuant to SEC Rule 613(c).” See CAT NMS Plan, supra note 3, at Section 1.1.

¹¹⁵ FIF Letter I at 3; FIF Letter II at 2.

¹¹⁶ FIF Letter I at 3.

¹¹⁷ Id. Contrary to FIF’s suggestion, the Commission understands that the Participants do, in fact, propose to store Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files older than 15 days in tiers like Glacier Deep Archive. See, e.g., note 107 and associated text supra.

do not provide regulatory value or are beyond the scope of CAT.”¹¹⁸ FIF requested that the Commission “provide clarification” as to why Industry Members and their customers should be “required to incur costs for storage of data that has no regulatory value.”¹¹⁹

The Commission does not agree that Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files have no regulatory value after final data is published at 8 a.m. Eastern Time on T+5. Although the Participants have represented that Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files has not yet been accessed by regulatory users,¹²⁰ the Participants have only very recently represented to the Commission that CAT implementation is complete.¹²¹ Current use is therefore not necessarily a reliable or dispositive reflection of the regulatory need for Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files. The Commission does agree, however, that the expected regulatory use cases involving this subset of data would likely not be time-sensitive, such that the Participants’ proposal to move Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files to a more cost-effective storage tier after 15 days reflects a reasonable approach.¹²² Accordingly, and pursuant to Rule 608(b)(2) under the Exchange Act,

¹¹⁸ FIF Letter I at 3-4.

¹¹⁹ Id.

¹²⁰ See, e.g., Notice, supra note 9, at 26986.

¹²¹ See CAT Q2 & Q3 2024 Quarterly Progress Report, available at https://catnmsplan.com/sites/default/files/2024-07/CAT_Q2-and-Q3-2024-QPR.pdf.

¹²² 17 CFR 242.608(b)(2). The Commission recognizes that the amendments proposed by the Participants here are not the only measures that could potentially reduce the costs of storing CAT Data. As noted above, commenters made several additional suggestions, including that the Commission consider revisions to its recordkeeping requirements, that the Commission evaluate what other data might be moved to more cost-effective storage solutions, that the Commission eliminate storage of Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files after T+5, and that the Commission and the Participants issue a public report explaining the value of maintaining

the Commission finds that it is appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Exchange Act to approve the proposed amendments that relate to the storage of Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files.

C. Codification and Expansion of Exemptive Relief Permitting Deletion of Industry Test Data Older Than Three Months

According to the Participants, Industry Members and Participants submit data to the CAT pursuant to required and voluntary testing, feedback files related to such data, and output files that hold the detailed transactions, referred to herein as “Industry Test Data.”¹²³ Under Section 1.2 of Appendix D of the CAT NMS Plan, such Industry Test Data must be saved for three months.¹²⁴ Separate from this specific three-month retention requirement, Rule 17a-1 under the Exchange Act requires every national securities exchange and national securities association to keep and preserve at least one copy of all documents, including all correspondence, memoranda,

such data. See notes 113-119 and associated text supra. But, in our view, it is appropriate to proceed with the Participants’ Proposal at this time. Approval of proposed Section 6.3 of Appendix D achieves cost savings sought by SIFMA and FIF without foreclosing the Commission’s or the Participants’ ability to consider additional cost savings measures in the future. And the existence of these additional cost savings measures or potential analyses does not call into question the proposed amendments’ satisfaction of the approval standard set forth by Rule 608(b)(2) or otherwise warrant a departure from the policy choices proposed by the Participants.

¹²³ Separately, the Participants stated that CAT LLC, through the Plan Processor, also retains “[o]perational metrics associated with industry testing (including but not limited to testing results, firms who participated, and amount of data reported and linked)” for six years, in accordance with the CAT NMS Plan. See Notice, supra note 9, at 26988 n.30; see also CAT NMS Plan, supra note 3, at Appendix D, Section 1.2. The Participants explained that the Proposal would not affect such operational metrics. See Notice, supra note 9, at 26988 n.30.

¹²⁴ See Notice, supra note 9, at 26988.

papers, books, notices, accounts, and other such records as shall be made or received by it in the course of its business as such and in the conduct of its self-regulatory activity, and to keep all such documents for a period of not less than five years, the first two years in an easily accessible place, subject to the destruction and disposition provisions of Rule 17a-6 under the Exchange Act.¹²⁵ Section 9.1 of the CAT NMS Plan, the general recordkeeping provision for the CAT NMS Plan, also states, in relevant part, that the Company shall maintain complete and accurate books and records of the Company in accordance with Rule 17a-1 under the Exchange Act.¹²⁶

The Participants explained that, on June 2, 2023, CAT LLC requested exemptive relief from Rule 17a-1 under the Exchange Act and certain provisions of the CAT NMS Plan relating to the retention of Industry Test Data beyond three months.¹²⁷ On November 27, 2023, the Commission granted the requested relief.¹²⁸ The Participants stated that their previous request for exemptive relief and the Industry Test Data Exemptive Relief Order apply only to Industry

¹²⁵ See 17 CFR 240.17a-1(a)-(b) and 17 CFR 240.17a-6; 15 U.S.C. 78q. See also Notice, supra note 9, at 26988. The Participants explained that the CAT is a facility of each of the Participants to the CAT NMS Plan. See Notice, supra note 9, at 26988.

¹²⁶ See id. at 26988-89.

¹²⁷ See Notice, supra note 9, at 26988; see also Letter from Brandon Becker, CAT NMS Plan Operating Committee Chair, to Vanessa Countryman, Secretary, Commission, dated June 2, 2023, <https://catnmsplan.com/sites/default/files/2023-06/06.02.23-Exemptive-Request-Test-Data-Retention.pdf>. As explained in the exemptive request, CAT LLC does not believe that Industry Test Data constitutes documents covered by Rule 17a-1 under the Exchange Act and adheres to its view that the specific three-month period for Industry Test Data supersedes the more general, longer retention periods in the CAT NMS Plan, but submitted the exemptive request to obtain regulatory clarity in light of Staff comments that the longer retention periods set forth in Rule 17a-1 under the Exchange Act and the CAT NMS Plan may apply to Industry Test Data.

¹²⁸ See Industry Test Data Exemptive Relief Order, supra note 8.

Test Data related to the CAT order and transaction system, not to the customer account and information system (“CAIS”).¹²⁹

The Participants therefore proposed to amend Section 1.2 of Appendix D of the CAT NMS Plan to provide that test data (whether related to the CAT order and transaction system or to the CAIS) may be deleted by the Plan Processor after three months.¹³⁰ Proposed Section 1.2 of Appendix D would continue to state that operational metrics associated with industry testing (including, but not limited to, testing results, firms who participated, and amount of data reported and linked) must be stored for the same duration as the CAT production data.¹³¹

The Participants explained that eliminating Industry Test Data older than three months as permitted by the Industry Test Data Exemptive Relief Order is expected to achieve approximately \$1 million per year in savings.¹³² According to the Participants, the proposed amendments would not generate additional cost savings beyond those achievable pursuant to the Industry Test Data Exemptive Relief Order,¹³³ although the Participants generally noted that actual future savings could be more or less than their estimates due to changes in a number of variables on which their estimates were based, including “current CAT NMS Plan requirements; reporting by Participants, Industry Members, and market data providers; observed data rates and volumes; current storage and compute pricing discounts, compute reservations, and cost savings plans (i.e., including savings attributable to the daily On-Demand Capacity Reservations and

¹²⁹ See Notice, supra note 9, at 26988.

¹³⁰ Id. at 26989.

¹³¹ Id.

¹³² Id.

¹³³ Id.

Compute Savings Plan); and associated cloud fees.”¹³⁴ The Participants stated that one-time implementation costs, which would “generally consist of Plan Processor labor costs associated with coding and software development, as well as any related cloud fees associated with the development, testing and load testing of the proposed changes,” were expected to be “minimal relative to overall cost savings” and explained that such costs “may vary based on various factors, including the details of any requirements in any final amendment approved by the Commission and any changes in labor costs.”¹³⁵ The Participants stated that “[o]ngoing operational costs, other than cloud hosting costs” would not be affected by the proposed amendments.¹³⁶ The Participants stated that they believed that “the cost savings estimates and assumptions [were] reasonable and provide[d] an adequate basis for the Commission to evaluate the costs and benefits” of their Proposal.¹³⁷

Two commenters, SIFMA and FIF, supported this aspect of the Proposal.¹³⁸ FIF further stated that it supported “deletion of all test data after one week” and requested that the Commission and the Participants “publish a cost-benefit analysis of any mandate to retain test data beyond one week,” which analysis should “identify any use cases that would involve access to test data beyond one week, including the regulatory purpose.”¹³⁹

¹³⁴ See Participant Letter, supra note 32, at 2; see also Amendment, supra note 13, at 81122-23.

¹³⁵ See Amendment, supra note 13, at 81123.

¹³⁶ Id.

¹³⁷ Id. at 81122-23.

¹³⁸ SIFMA Letter I at 4; FIF Letter I at 5. See also Nasdaq Letter (reiterating points made by the Participants in their filings and noting the support of SIFMA and FIF).

¹³⁹ FIF Letter I at 5; FIF Letter II at 2.

The Commission understands from the Participants that the primary purpose of Industry Test Data is to facilitate CAT Reporter testing needs and not to facilitate regulatory use.¹⁴⁰ The Commission therefore agrees with the Participants and the commenters that, in light of the approximately \$1 million per year cost for retaining Industry Test Data beyond three months, the proposed approach to retention of Industry Test Data is reasonable. Accordingly, and pursuant to Rule 608(b)(2) under the Exchange Act, the Commission finds that it is appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Exchange Act to approve the provisions of the Proposal that relate to the retention of Industry Test Data.¹⁴¹

Although the Participants did not specifically also request exemptive relief from Rule 17a-1 under the Exchange Act with respect to Industry Test Data related to the CAIS,¹⁴² such

¹⁴⁰ See, e.g., Industry Test Data Exemptive Relief Order, supra note 8, at 84027. The Commission recognizes that there are additional measures beyond those proposed by the Participants here that could further reduce the costs associated with retaining Industry Test Data, such as FIF’s suggestions that Industry Test Data be deleted after one week and/or that the Commission and that the Participants conduct a related cost-benefit analysis. But, in our view, it is appropriate to proceed with the Participants’ Proposal at this time. Approval of proposed Section 1.2 of Appendix D advances FIF’s stated goal to “manage and reduce CAT operating costs,” FIF Letter I at 2, and does not foreclose the Commission’s or the Participants’ ability to consider additional cost savings measures in the future. And the existence of these additional cost savings measures or potential analyses does not call into question the proposed amendments’ satisfaction of the approval standard set forth by Rule 608(b)(2) or otherwise warrant a departure from the policy choices proposed by the Participants.

¹⁴¹ 17 CFR 242.608(b)(2).

¹⁴² 17 CFR 240.17a-1; see also 15 U.S.C. 78q (requiring, among other things, the Participants and their members to make and keep for prescribed periods such records, furnish such copies thereof, and make and disseminate such reports as the Commission, by rule, prescribes as necessary in the public interest, for the protection of investors, or otherwise in furtherance of the purposes of the Exchange Act). As the Participants explain, the Commission has already granted such exemptive relief for Industry Test Data

relief is necessary in order to effectuate the Proposal, as Rule 17a-1 would otherwise require Industry Test Data related to the CAIS to be retained for a longer time period. For the above-described reasons, and consistent with its action in the Industry Test Data Retention Exemptive Relief Order, the Commission finds that it is appropriate in the public interest and consistent with the protection of investors under Section 36 of the Exchange Act,¹⁴³ as well as consistent with the public interest, the protection of investors, the maintenance of fair and orderly markets and the removal of impediments to, and the perfection of, a national market system under Rule 608(e) under the Exchange Act,¹⁴⁴ to grant relief that exempts each Participant from the longer recordkeeping and data retention requirements for CAIS-related Industry Test Data that otherwise would apply as set forth in Rule 17a-1 under the Exchange Act.¹⁴⁵

D. Other Comments Received on the Proposal

Both commenters proposed that additional steps be taken to further manage and reduce CAT operating costs.¹⁴⁶ For instance, SIFMA expressed concern that the Commission, “the primary beneficiary of the CAT, . . . does not pay for it, and thus does not have a direct incentive to consider costs, or opportunities for cost savings, in connection with making decisions regarding its operation.”¹⁴⁷ SIFMA stated that the Commission’s “rejection” of provisions that would have permitted the Plan Processor to provide an interim CAT-Order-ID to regulatory

related to the order and transaction system. See note 129 and associated text supra; see also Industry Test Data Exemptive Relief Order, supra note 8.

¹⁴³ 15 U.S.C. 78mm(a)(1).

¹⁴⁴ 17 CFR 242.608(e).

¹⁴⁵ 17 CFR 240.17a-1.

¹⁴⁶ See, e.g., FIF Letter I at 2; SIFMA Letter I at 1.

¹⁴⁷ SIFMA Letter II at 2. See also note 173 and associated text for a discussion of how investors benefit from CAT-enabled regulatory activities.

users on an “as requested” basis, rather than on a daily basis – provisions that were initially included in the Proposal,¹⁴⁸ but withdrawn by the Participants¹⁴⁹ – suggested that “costs and cost savings are not necessarily a Commission priority in connection with decision-making regarding the operation of the CAT.”¹⁵⁰

SIFMA therefore suggested that the Commission and the Participants should “assess their own CAT usage patterns and needs to identify further cost saving measures.”¹⁵¹ SIFMA further stated that the CAT “should be operated to meet the reasonable and legitimate needs of regulators, and not as a monolith to address any regulatory use case regardless of the costs.”¹⁵²

SIFMA stated that the “Commission’s action in connection with Amendment No. 1 to the proposed Cost Savings Amendment” demonstrated the need for the Participants and the Commission to “provide Industry Members with a more meaningful opportunity to contribute

¹⁴⁸ See Notice, supra note 9, at proposed Appendix D, Section 6.1.

¹⁴⁹ See Amendment, supra note 13, at 81120, 81122.

¹⁵⁰ SIFMA Letter II at 2-3. SIFMA also noted that “the level of detail the Commission required the Participants to provide to justify other aspects of the proposed Cost Savings Amendments in Amendment No. 1, such as requiring the Participants to provide actual data on the proposed savings related to the processing, query, and storage requirements for options market maker quotes, goes well beyond what the Commission required the Participants to provide in their last set of CAT fee filings.” SIFMA Letter II at 3. SIFMA stated that “[t]hese inconsistent actions by the Commission,” including its “failure . . . to offer data to support the regulatory value of the interim CAT-Order-ID,” suggested “that while the Commission is concerned about preserving what it perceives as the regulatory utility of the CAT, it does not necessarily give equal weight or consideration to the ever-increasing costs associated with operating it.” Id. at 3. The Commission does not agree that it has acted in a manner inconsistent with its obligations. In each of the proceedings discussed by the commenter, the Commission has sought from the Participants the information necessary to make the required findings in accordance with the rules and regulations that govern the Commission action at issue.

¹⁵¹ SIFMA Letter I at 2; SIFMA Letter II at 4.

¹⁵² SIFMA Letter I at 2; SIFMA Letter II at 4.

their experience and expertise to the CAT’s budget setting and cost savings processes.”¹⁵³

Specifically, SIFMA recommended that the Participants establish a separate working group that includes Industry Members to focus on ways the CAT System can be made more efficient from a cost perspective while still achieving its goals, rather than relying on the existing Cost Management Working Group, which is comprised solely of Participant members.¹⁵⁴ “Without more direct involvement by Industry Members in the CAT budgeting process,” SIFMA stated that “there is an insufficient structural framework and incentives to bring CAT costs under control.”¹⁵⁵

FIF expressed similar concerns.¹⁵⁶ Noting that the Participants have recently estimated “total CAT operating expenses of \$248,846,076 for 2025,” FIF stated that this “14.8% increase over the estimated CAT operating expenses for 2024” was “not sustainable over the long-term.”¹⁵⁷ FIF stated that it was “imperative that the Commission take steps to manage CAT operating costs,” including approval of the Proposal and other recommendations made by FIF in their comment letters that were not included in the Proposal.¹⁵⁸ FIF further requested that the

¹⁵³ SIFMA Letter I at 1; SIFMA Letter II at 3-4.

¹⁵⁴ SIFMA Letter I at 1; SIFMA Letter II at 3-4.

¹⁵⁵ SIFMA Letter I at 1; SIFMA Letter II at 4.

¹⁵⁶ Some of these concerns were also set forth in a previous comment letter to the Commission that was jointly submitted by SIFMA and FIF. See FIF Letter I, at 5 n.19; see also Letter from Joseph Corcoran, Managing Director, Associate General Counsel, and Ellen Greene, Managing Director, Equities & Options Market Structure, SIFMA, and Howard Meyerson, Managing Director, FIF, to Secretary, Commission, dated July 31, 2023, available at <https://www.sec.gov/comments/4-698/4698-238359-498762.pdf>.

¹⁵⁷ See Letter from Howard Meyerson, Managing Director, FIF, to Secretary, Commission, dated Dec. 2, 2024, at 2, available at <https://www.sec.gov/comments/4-698/4698-544735-1559702.pdf> (“FIF Letter III”).

¹⁵⁸ Id. In addition to the measures described above, FIF urged the Commission to “reevaluate the currently-mandated CAT processing timeframes, which FIF members

Commission “publish a report setting forth the factors giving rise to the significant estimated cost increase for 2025 and whether these factors will continue to apply year-over-year for the foreseeable future.”¹⁵⁹ FIF stated that the Commission “should not impose CAT reporting requirements that are beyond the scope of Commission Rule 613 and the CAT NMS Plan” and that “[p]roposed changes to current CAT processing or reporting requirements that could involve further significant increases in CAT operating costs should be subject to an appropriate cost-benefit analysis that is included as part of a CAT NMS Plan amendment.”¹⁶⁰

Contrary to the assertions of SIFMA, both the Commission and the Participants have demonstrated their commitment to reducing CAT costs where appropriate – and even where there is some amount of regulatory loss – as evidenced by the very existence of the cost savings measures proposed by the Participants and approved herein by the Commission.¹⁶¹ The Participants have already formed a Cost Management Working Group comprised of senior members of the Participants that works to find and address cost management needs,¹⁶² and the findings of this group are discussed with the Industry Members that sit on the CAT’s Advisory Committee.¹⁶³ There are also meaningful and reasonable constraints set on the CAT budgeting

consider to be a major contributor to the high CAT operating costs.” Id.; see also FIF Letter I at 5.

¹⁵⁹ FIF Letter III at 2.

¹⁶⁰ FIF Letter I at 5.

¹⁶¹ See also Nasdaq Letter at 2-3 (“Similar to SIFMA and FIF, Nasdaq believes that reducing CAT costs requires more work and exploration of other methods. The Cost Savings Amendment is the beginning of what Nasdaq expects will be a range of strategies to lessen the increasing costs. . . . Participants are proposing these changes as a first step in their efforts to reduce CAT costs while exploring further cost-saving measures.”).

¹⁶² See Securities Exchange Act Release No. 98290 (Sept. 6, 2023), 88 Fed. Reg. 62628, 62655 (Sept. 12, 2023) (“CAT Funding Model Approval Order”).

¹⁶³ See CAT NMS Plan, supra note 3, at Section 4.13.

process, including a process that gives Industry Members a chance to review and publicly comment on the CAT's budget and that requires Commission review of CAT funding.¹⁶⁴ And the Commission agrees with FIF that any amendments to the requirements of Rule 613 and/or the CAT NMS Plan must be pursued either: (1) through a Commission-led rule-making process that includes public notice and comment and economic analysis; or (2) through the amendment process set forth under Rule 608, which would require the Participants to file with the Commission a proposed amendment to the CAT NMS Plan, subject that amendment to public notice and comment, and generally require approval by the Commission and a consideration of the impact of the amendment on efficiency, competition, and capital formation.¹⁶⁵

In determining whether any particular cost savings amendment meets the approval standard set forth in Rule 608(b)(2), the Commission evaluates and balances many factors, including the amount of costs savings as well as the potential downstream harms to investors and the U.S. financial markets that could result from less effective regulatory oversight by the SROs and the Commission. The Commission emphasizes that its approval of the specific cost savings amendments that the Participants have proposed for consideration in this proceeding does not foreclose future consideration of additional cost savings amendments and analyses, including the withdrawn interim CAT-Order-ID proposal and the other measures suggested by commenters.¹⁶⁶

¹⁶⁴ See, e.g., CAT Funding Model Approval Order, *supra* note 162, at 62652-57.

¹⁶⁵ See 17 CFR 242.608; see also 17 CFR 242.613(a)(5) (“No national market system plan filed pursuant to this section, or any amendment thereto, shall become effective unless approved by the Commission or otherwise permitted in accordance with the procedures set forth in § 242.608. In determining whether to approve the national market system plan, or any amendment thereto, and whether the national market system plan is in the public interest under § 242.608(b)(2), the Commission shall consider the impact of the national market system plan or amendment, as applicable, on efficiency, competition, and capital formation.”).

¹⁶⁶ See also notes 78, 122, and 140 *supra*.

III. Efficiency, Competition, and Capital Formation

A. Introduction

In determining whether to approve an amendment to the CAT NMS Plan and whether that amendment is in the public interest, Rule 613 requires the Commission to consider the impact of that amendment on efficiency, competition, and capital formation.¹⁶⁷ The Participants stated that their proposed amendments “will have a positive impact on competition, efficiency, and capital formation.”¹⁶⁸ The Commission has analyzed the potential impacts of the Proposal.

Based on its analysis, and after considering potential sources of imprecision in the Participants’ estimates, the Commission concludes that savings in operating costs will enhance the operational efficiency of CAT,¹⁶⁹ while the changes to CAT Data will lessen some regulatory efficiencies. These changes to regulatory efficiencies, however, are likely to be limited for regulatory activities using small samples of data but potentially more significant for certain time-sensitive regulatory activities using large amounts of data. Effects on market efficiency, competition, and capital formation, stemming from the impacts of the Proposal on regulatory and operational efficiencies, will likely be second-order and limited.

B. Baseline

In analyzing the impact of the Proposal on efficiency, competition and capital formation, the Commission considered the current CAT Data¹⁷⁰ as the baseline. Specifically, the baseline consists of the current properties, and the actual and potential regulatory usages of the CAT Data, in the absence of the Proposal. CAT Data was intended to make possible reconstruction of

¹⁶⁷ 17 CFR 242.613(a)(5).

¹⁶⁸ See Notice, *supra* note 9, at 26989.

¹⁶⁹ See *infra* note 188.

¹⁷⁰ See *supra* note 6 for a description of “CAT Data.”

market events,¹⁷¹ market analysis and research that inform policy decisions, regulatory activities such as market surveillance, examinations and investigations, and more efficient execution of numerous other regulatory functions.¹⁷² In the CAT NMS Plan Approval Order, the Commission explained how investors benefit from the CAT-enabled improvements to such regulatory activities.¹⁷³

The first provision of the Proposal focuses on Options Market Maker quotes in Listed Options. Along with their lifecycle linkages and associated derived fields, Options Market Maker quotes in Listed Options are currently accessible via an online targeted query tool, called DIVER. Alternatively, regulatory users with specialized knowledge of remote data processing and the structured query programming language (“SQL”) can use BDSQL to construct and run their own complex queries.¹⁷⁴

The Participants stated that, while the Options Market Maker quotes in Listed Options constitute the largest component of CAT Data,¹⁷⁵ only a small fraction of them end in an

¹⁷¹ In market reconstructions, regulators aim to provide an accurate and factual accounting of what transpired during a market event. These market events often encompass activities in many securities across multiple trading venues. See CAT NMS Plan Approval Order, supra note 3, at 84805.

¹⁷² See CAT NMS Plan Approval Order, supra note 3, at 84833-84840.

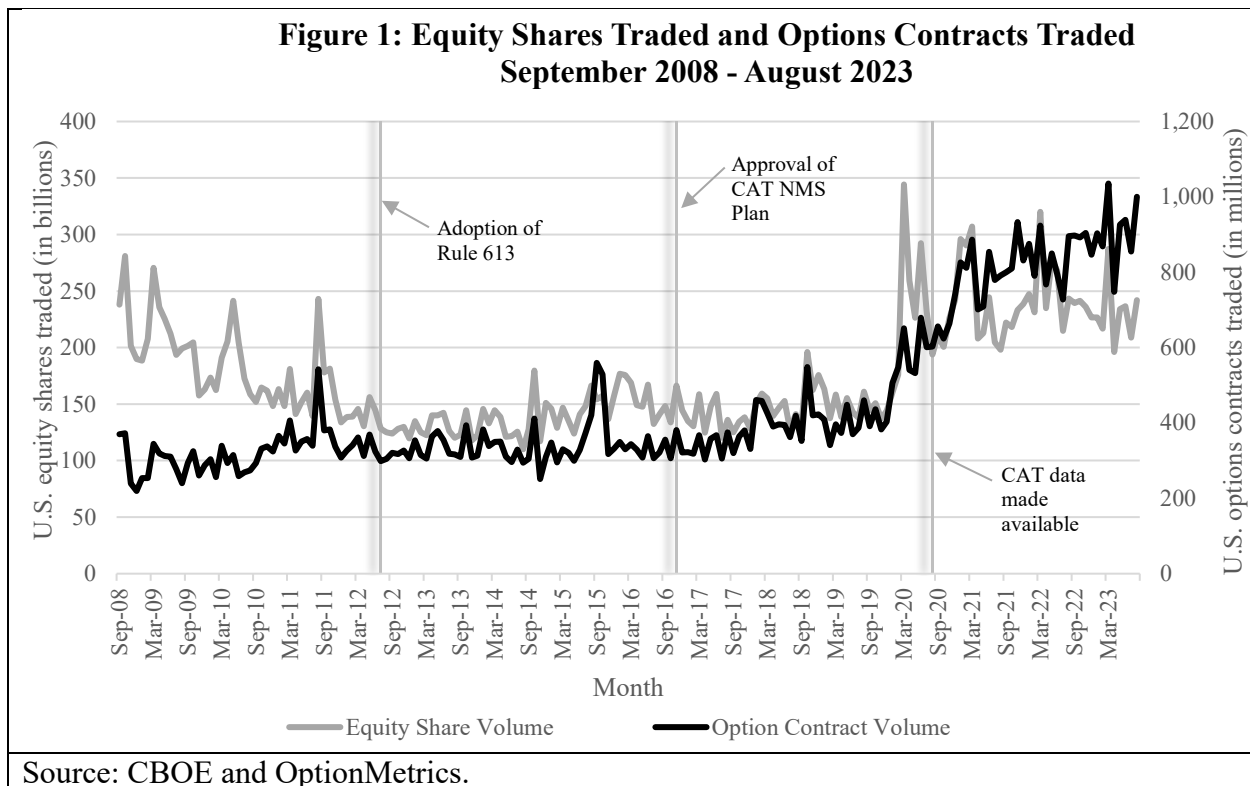
¹⁷³ A discussion of the expected benefits and regulatory usage of the CAT NMS Plan is available in the CAT NMS Plan Approval Order. See CAT NMS Plan Approval Order, supra note 3, at 84816-84840.

¹⁷⁴ Id. at Section 6.10(c)(i)(B) (requiring the user-defined direct queries tool to provide authorized users with the ability to retrieve CAT Data via a query tool or language that allows users to query all available attributes and data sources). See also supra note 45 and associated text.

¹⁷⁵ The Participants state that these quotes comprise approximately 98% of all options exchange events and approximately 75% of all transaction volume stored in the CAT. They, however, do not specify the time period over which these estimates were obtained. See Notice, supra note 9, at 26984.

execution or allocation.¹⁷⁶ In addition, the Proposal stated that “the vast majority of Options Market Maker Quote lifecycles consist of just two events—the quote and its subsequent cancellation,”¹⁷⁷ which suggests that these quotes have simple lifecycles.

Figure 1 shows the backdrop of the evolution of Options Market Maker quotes in Listed Options, which is that the options market has experienced noticeable overall growth. As Figure 1 shows, the volumes in both the equity and the options markets (equity shares traded and options contracts traded, respectively) have markedly increased since early 2020. While volume growth has somewhat stagnated in the equity market since 2021, volume has continued to grow in the options market. Between 2016 and 2022, the volume of equity shares traded increased by 61 percent and options contracts traded increased by 153 percent.



¹⁷⁶ See Notice, *supra* note 9, at 26984; see also Participant Letter, *supra* note 32, at 2.

¹⁷⁷ See Notice, *supra* note 9, at 26984.

Note: Figure 1 presents Equity Shares Traded in U.S. Equity Markets and Options Contracts Traded in U.S. Options Markets over the period September 2008 - August 2023.

Table 1 presents an analysis of CAT Data from the first quarter of 2024. It shows that, approximately 90 percent of all options-related events and 80 percent of all events in CAT are Options Market Maker quotes in Listed Options,¹⁷⁸ which include both OQ and OQC events.¹⁷⁹ OQ events account for approximately 72 percent of all options-related events and 63 percent of all events in CAT.

Table 1: The shares of options quote events and Options Market Maker quotes in Listed Options in CAT January 2024 - March 2024			
	Jan-24	Feb-24	Mar-24
<i>Panel A (numbers in billions)</i>			
All events in CAT (1) [= (2) + (9)]	8,164	7,811	7,892
All options-related events in CAT (2) [= (3) + (8)]	7,166	6,905	7,039
All options exchange events (3) [= (4) + (7)]	6,817	6,530	6,655
OMM ^a quotes in Listed Options (4) [= (5) + (6)]	6,528	6,225	6,340
Options quote (OQ) events (5)	5,287	4,884	4,896
Options quote cancel (OQC) events (6)	1,241	1,341	1,444
Other options exchange events (7)	289	305	315
Industry member options-related events (8)	349	376	384
All equities events in CAT (9)	998	906	853
<i>Panel B (%)</i>			
Options quote events as percent of all options exchange events [=100*(5)/(3)]	78	75	74
Options quote events as percent of all options-related events in CAT [=100*(5)/(2)]	74	71	70
Options quote events as percent of all events in CAT [=100*(5)/(1)]	65	63	62
Options Market Maker quotes in Listed Options as percent of all options exchange events [=100*(4)/(3)]	96	95	95
Options Market Maker quotes in Listed Options as percent of all options-related events in CAT [=100*(4)/(2)]	91	90	90

¹⁷⁸ These estimates are similar to those presented in the Notice. See supra note 175.

¹⁷⁹ Lifecycles that include both OQ and OQC events can have more than two events. For example, lifecycles with both OQ and OQC events can also have quote modifications and partial executions. See also supra note 30 and associated text.

Options Market Maker quotes in Listed Options as percent of all events in CAT $[=100*(4)/(1)]$	80	80	80
Source: CAT Data. Notes: (1) Other options exchange events include options order accepted, options order modified and options order canceled events, internal options route and options cancel route events, options trade events, and various other options exchange events. Industry member options-related events include industry member options events and industry member multi-leg events. (2) All equities events in CAT include all equities exchange events and industry member equities events. (3) All events in CAT include all options exchange events, all equities exchange events, and all industry member events. ^a OMM refers to Options Market Maker.			

Further analysis of options trades associated with Options Market Maker quotes in Listed Options, in the options market data from Q1-2024,¹⁸⁰ showed that the number of option trades associated with Options Market Maker quotes in Listed Options as percent of CAT OQ events is small, 0.001 percent or less.¹⁸¹ The analysis, however, also shows that a substantial portion of all options trades, approximately 20 percent, is associated with Options Market Maker quotes.

An analysis of lifecycles of Options Market Maker quotes in selected Listed Options shows that at least for some options on some days these lifecycles can be more complex than suggested by the Participants.¹⁸² For these selected Options, 63 percent of the Options Market Maker quotes had a lifecycle with two events, while almost 10 percent had lifecycles that included five or more events.

¹⁸⁰ In this analysis, both OQ events and option trade (OT) events are defined as one-sided events. Thus, each side of a trade is counted as a separate trade.

¹⁸¹ This supports the Participants' statements, see supra note 176.

¹⁸² Focusing on one day, March 7, 2024, this analysis studied the Listed Options on one widely traded ETF. The number of CAT events per CAT lifecycle reflects the number of CAT events that occurred on March 7, 2024, for CAT lifecycles that had an options quote event also on March 7, 2024. On March 7, 2024, options with the underlying ETF used in this analysis had one of the highest volumes of options exchange CAT events across all underlying symbols. See supra note 177 and associated text for the Participant's characterization of the lifecycles of the Options Market Maker quotes in Listed Options.

The second provision of the Proposal involves Raw Unprocessed Data, Interim Operational Data and/or submission and feedback files data. These data are currently available without “manual intervention” for at least six years within certain query tools.¹⁸³ These data are currently stored within the Central Repository via AWS S3-FA storage tier for the first 30 days, in the S3-Infrequent Access tier for the next 60 days, and in the S3-Archive Instant Access tier thereafter.¹⁸⁴ Access to such data prior to the availability of final data can improve the timeliness of regulatory activities for those regulators who do not already have such data.¹⁸⁵

The third provision of the Proposal relates to the retention of Industry Test Data.¹⁸⁶ Industry Members and Participants submit data to CAT pursuant to both required and voluntary testing; CAT retains the Industry Test Data in connection with such testing. Industry Test Data associated with CAIS is required to be retained for six years whereas CAT LLC was previously permitted to eliminate Industry Test Data related to the CAT order and transaction system after three months.¹⁸⁷ The Participants proposed that test data (whether related to the CAT order and transaction system or to the CAIS) may be deleted by the Plan Processor after three months.

¹⁸³ See supra notes 86-87 and associated text.

¹⁸⁴ See supra note 94 and associated text.

¹⁸⁵ See CAT NMS Plan Approval Order, supra note 3, at 84831 for a discussion of the improvements to timeliness of access to such data. In addition, based on Commission staff’s knowledge of CAT, these are the only data within CAT that identify error records and corrections.

¹⁸⁶ See supra section II.C, supra note 123 and associated text.

¹⁸⁷ In November 2023, the CAT LLC was granted exemptive relief from the requirement to retain Industry Test Data for six years and was permitted to eliminate such data after three months. The Participants stated that this exemptive relief applied only to Industry Test Data related to the CAT order and transaction system, not to CAIS. See supra section II.C, supra notes 127-128 and associated text.

C. Efficiency

The Commission analyzed three types of efficiency impacts from the Proposal: operational efficiency in terms of cost savings of operating the Central Repository;¹⁸⁸ regulatory efficiency in terms of the impact of changes in CAT Data on regulatory activities; and market efficiency in the form of second order impacts on the market.

As discussed further below, cost savings in operating the Central Repository represent an enhancement of the operational efficiency of CAT. The changes to CAT Data from the Proposal will lessen some regulatory efficiencies by delaying certain regulatory activities. While these inefficiencies could be relatively more significant for certain time-sensitive regulatory activities involving large amounts of data, in general, these inefficiencies are likely to be limited.¹⁸⁹ Effects on market efficiency, competition, and capital formation, which stem from the aforementioned impacts of the Proposal on regulatory and operational efficiencies, will likely be second-order and, hence, also limited.

1. Operational Efficiency

The Proposal will result in operational cost savings, net of implementation costs, of operating the Central Repository, which will reduce the CAT Fees borne by Participants, Industry Members, and investors (through pass-throughs). The Participants' estimates of cost

¹⁸⁸ Economically, operational efficiency refers to the effective use of resources to generate a given output. In the case of CAT, the output refers to the CAT Data, which are generated for regulatory purposes. Even though the outputs, CAT Data, under the proposal are not the same as that in the absence of the proposal, the analysis of operational efficiency is simplified by focusing on the use of resources as measured by the cost savings, net of implementation costs; the efficiency effects of changes in CAT Data are discussed separately (as impacts on regulatory efficiency).

¹⁸⁹ The Participants characterized the impact of the Proposal as a whole, on regulatory functions, regulatory users or CAT Data, as "limited" or "minimal." See Notice, supra note 9, at 26983-26986; see also Amendment, supra note 13, at 81121; Participant Letter, supra note 32, at 1.

savings could be imprecise, however. The actual cost savings could differ from the projected cost savings for several reasons including: (1) assumptions used to generate estimates, (2) uncertainty in the future direction of a number of factors, (3) implementation costs, which are not included in the estimates, (4) some of the cost savings representing costs transferred to regulators, and (5) potential interactions of the Proposal with a recent regulatory change. These issues could mean that the Participants' estimates are somewhat over-estimated or, alternatively, potentially considerably underestimated, depending upon the assumptions and methodologies used.

a. Estimated cost savings, methodologies and assumptions

The Proposal will result in meaningful cost savings even when considering some of the alternate methodologies and assumptions discussed below. The Participants estimate that the cost savings will be \$21 million in the first year, which is 11 percent of the total operating costs of CAT in 2023.¹⁹⁰ The Participants state that they believe their assumptions and estimates are reasonable.¹⁹¹ The Commission acknowledges the necessity of using simplifying assumptions to generate estimates and that such assumptions can affect the precision of the estimates. The Commission has considered the methodologies and assumptions and concludes that there are at least three issues that could affect the magnitude of the cost estimates - two relating to the volume of CAT Data affected and one relating to a processing cost assumption. However, the cost savings will be meaningful regardless of these issues.

¹⁹⁰ For 2023 total operating costs, see Consolidated Audit Trail, LLC, 2023 Financial and Operating Budget (Revised as of Nov. 7, 2023) available at <https://www.catnmsplan.com/sites/default/files/2023-11/11.07.23-CAT-2023-Financial-and-Operating-Budget.pdf>; see also Consolidated Audit Trail, LLC, 2023 Financial and Operating Budget, <https://www.catnmsplan.com/sites/default/files/2024-01/01.17.24-CAT-Q4-2023-Budget-vs-Actual.pdf> (last visited Oct. 23, 2024).

¹⁹¹ See Participant Letter, supra note 32, at 3.

The Participants' cost estimates¹⁹² are generated using current costs. Specifically, the Participants state that, among other things, cost savings estimates are based on “observed data rates and volumes; current discounts, reservations and cost savings plans; and associated cloud fees.”¹⁹³ The Commission agrees that using current costs to generate cost savings estimates is reasonable and recognizes that the cost savings in the future could change depending on factors discussed in the next section.¹⁹⁴

The Participants' storage cost saving estimates are annual cost savings for the first year. However, the CAT NMS Plan requires the storage of six years of data, so the maximum annual cost savings would not be achieved in the first year.¹⁹⁵ Indeed, the Proposal will result in additional potential annual cost savings each year until the Proposal affects the annual storage of six years of data. Based on the current assumptions, the cost savings could eventually reach \$48 million per year for the provision on Options Market Maker quotes in Listed Options.¹⁹⁶

¹⁹² See supra sections II.A, II.B, and II.C for additional discussions of these estimates.

¹⁹³ See Notice, supra note 9, at 26983, note 8. See also, Participant Letter, supra note 32, at 2; Amendment, supra note 13, at 81122.

¹⁹⁴ In addition, the cost savings estimates for the provision on Raw Unprocessed, Interim Operational Data and/or submission and feedback files do not include any Options Market Maker quotes on Listed Options data. This helps to ensure that this provision does not also count cost savings that would be attributed to the provision that would set forth the new processing, query, and storage requirements for Options Market Maker quotes in Listed Options (i.e., Participants do not double count cost savings).

¹⁹⁵ None of the Notice, Participant Letter, or Amendment states directly whether the costs are estimated for one year or six years of data. While the Participants state that they assume current CAT requirements, they also state that the estimates for the Options Market Maker quotes in Listed Options provision are “in the first year.” See Notice, supra note 9, at 26983-26985; see also Participant Letter, supra note 32, at 1-2 and 8.

¹⁹⁶ These estimates assume that the Participants' cost savings estimates are for one year of data, such that cost savings eventually reflect five additional years of data. The \$48 million estimate is six times the \$8 million estimate for the first year. This assumes constant message traffic and the Participants' 1:1:8 cost ratio across the S3 storage tiers. See supra note 56 and associated text; see also Notice, supra note 9, at 26983, note 8.

Likewise, the storage cost savings from the provision on Raw Unprocessed, Interim Operational Data and/or submission and feedback files could reach \$6 million per year to account for a baseline of storing six years of data in an S3 storage tier.¹⁹⁷ These additional annual cost savings would not be expected in full until six years after the implementation of the Proposal.

The Participants' estimates may also not account for the one-time cost savings for affected historical data. The primary historical CAT Data affected by the Proposal are the Raw Unprocessed, Interim Operational Data and/or submission and feedback files.¹⁹⁸ All Raw Unprocessed, Interim Operational Data and/or submission and feedback files older than 15 days will be moved to a cheaper storage tier, including historical data. However, the Participants describe the cost savings estimates as "annual,"¹⁹⁹ suggesting that they do not account for historical data. We estimate that including historical data could add up to \$4 million in one-time cost savings.²⁰⁰

The Participants, however, likely over-estimated the \$12 million estimate in annual processing cost savings from the provision on Options Market Maker quotes in Listed Options. To generate this estimate, the Participants apparently assumed that the per message linkage costs

¹⁹⁷ The \$6 million estimate is six times the \$1 million annual estimate. This assumes constant message traffic and the Participants' 1:1:8 cost ratio across the S3 storage tiers. See supra note 132 and associated text; see also Notice, supra note 9, at 26983, note 8.

¹⁹⁸ While the CAIS test data provision will also affect historical data, those data are much smaller and have a much shorter history.

¹⁹⁹ See e.g., Notice, supra note 9, at 26986.

²⁰⁰ If we assume the same annual storage footprint and add four additional years of data, we get an additional cost savings of \$4 million. However, the CAT NMS Plan was not fully implemented for the entire four years, and therefore the storage footprint of later years is larger than earlier years. A smaller storage footprint for this cost savings would result in a smaller cost savings estimate.

of options events were the same as those for equities events,²⁰¹ but this is unlikely.²⁰² As the CAT Funding Model Approval Order discusses, the linkage processing of equities orders is generally more complex than the linkage processing of options orders.²⁰³ Further, Options Market Maker quotes in Listed Options have mostly simple lifecycles.²⁰⁴ However, the volume of the Options Market Maker quotes in Listed Options data suggests that they will still account for a large proportion of overall linkage processing costs.²⁰⁵ Therefore, while the cost savings could be less than \$12 million, they will likely still be large.

The Participants did not estimate any cost savings from the provision on CAIS test data but reiterated the \$1 million cost savings from the prior related exemptive relief.²⁰⁶ We expect these test data to have a small storage footprint. While the cost savings will be positive, they are

²⁰¹ The \$12 million estimate allocates \$27,000/day to linkages involving Options Market Maker quotes in Listed Options. When comparing this figure to others from the Participants, it seems to be in line with the relative volume of Options Market Maker quotes in Listed Options in CAT Data, indicating that this figure comes from an implied assumption of similar per message linkage costs. See Amendment, supra note 13, at 81123; see also Notice, supra note 9, at 26983-26984 and 26988.

²⁰² The Commission understood that complexity of the order lifecycles is a cost driver within the linkage processing. See CAT Funding Model Approval Order, supra note 162, at 62677.

²⁰³ See CAT Funding Model Approval Order, supra note 162, at 62678. The “Linker” costs involve looking across four days of data to link order messages across a lifecycle. See id., at 62677. Certain order handling practices of Industry Members, such as the use of riskless principal transactions, involve relatively more complex linkages. See id.

²⁰⁴ This is consistent with the analysis presented above regarding complexities of lifecycles in the Options Market Maker quotes in Listed Options. See supra section III.B; see also supra note 177 and the associated text.

²⁰⁵ As the Participants stated, “there is not a linear relationship between volume and costs; rather, a combination of volume and processing complexity drive costs.” See Notice, supra note 9, at 26984, note 14.

²⁰⁶ See Notice, supra note 9, at 26989.

unlikely to increase the approximate magnitude of the cost savings from the prior exemptive relief.

b. Future magnitude of cost savings

The Participants recognize that the actual future cost savings could differ from the estimates because of uncertainty in several factors.²⁰⁷ These factors include the number of exchanges, Plan requirements, data rates and volumes, discounts, reservations and cost savings plans, and cloud fees.²⁰⁸ The Participants also state that future cost savings could be greater than the estimates as data volumes grow over time.²⁰⁹ The Participants produce cost savings estimates that apply only to the first year of implementation.²¹⁰ However, the cost savings estimated for the first year may not continue at the same level for at least two reasons: (1) changes in the costs of cloud computing, and (2) changes in the frequency of regulatory requests to have data restored.

Cost savings (and CAT operational costs) could decline as cloud computing evolves. The storage and computing services industries, technologically, are among the most rapidly evolving industries. In some estimates, the costs of host computer and storage services have steadily declined.²¹¹ Similar trends can be observed in the pricing of some of the cloud storage

²⁰⁷ See Notice, supra note 9, at 26983, note 8; see also Participant Letter, supra note 32, at 2-3.

²⁰⁸ See Notice, supra note 9, at 26983, note 8; see also Participant Letter, supra note 32, at 2.

²⁰⁹ See Participant Letter, supra note 32, at 2.

²¹⁰ The Participants state that all costs and savings projections are estimates only and reflect the current state and costs of CAT operations. See the Proposal, supra note 4, at 2; see also Participant Letter, supra note 32, at 2-3.

²¹¹ See, for example, the Federal Reserve Bank of St. Louis publication of monthly aggregate cost data on host computers and servers, at <https://fred.stlouisfed.org/series/WPU11510116> (last visited Dec 5, 2024); the cost estimate for *Machinery and Equipment: Host Computers, Multiusers (Mainframes, Unix*

products.²¹² The Participants' estimated cost savings of \$21 million are based on the current cloud computing and storage costs.²¹³ Therefore, declines in cloud computing costs could result in smaller than expected future cost savings.

On the other hand, if message traffic keeps increasing, then, despite the rapid technological advancements, the future cost savings could be higher than those estimated for the first year.²¹⁴ Indeed, one new options exchange has started operations since the publication of the Notice, likely resulting in a higher volume of Options Market Maker quotes in Listed Options.²¹⁵ In addition, one new equities exchange has been approved since the costs were

and PC Servers) in August 2024 is 26 percent of that in December 2004. In contrast, the same publication estimated that the cost for all commodities for August 2024 is 170 percent of that in December 2004. From December 2004 until March 2021, the price of host computers and servers was on a downward trend. Then, from March 2021 to July 2022, these prices rose. Prices have since stayed close to or below June 22 level. Note that different indices use different methodologies and industry/product classifications and these estimates can be different from estimates by other agencies.

²¹² On November 1, 2008, for example, AWS *Storage (standard)* was priced at \$0.12 per GB per month. In August of 2024, *S3 (standard)* was priced as "Over 500 TB / Month \$0.021 per GB" (a decline of 83 percent). New service tiers were also introduced, for example, in August of 2024, *S3 Infrequent Access* (long lived but infrequently accessed data that needs millisecond access) was priced as "All Storage / Month \$0.0125 per GB" (90 percent decline compared to the 2008 product), *S3 Archive Instant Access* as "All Storage / Month \$0.004 per GB," and *S3 Glacier Deep Archive* (long-term archiving, accessed once or twice in a year and can be restored within 12 hours) was priced as "All Storage / Month \$0.00099 per GB" (99 percent decline compared to the 2008 product). See AWS, *New Tiered Pricing for Amazon S3 Storage*, (Oct. 9, 2009) available at <https://aws.amazon.com/about-aws/whats-new/2008/10/09/new-tiered-pricing-for-amazon-s3-storage/>; see also AWS, *Amazon S3 Pricing*, available at <https://aws.amazon.com/s3/pricing/> (last visited Dec. 5, 2024).

²¹³ \$20 million of these savings are based on a 65 percent reduction in computer runtime for Options Exchange events, and an 80 percent reduction in storage footprint. See Participant Letter, *supra* note 32, at 3.

²¹⁴ This is also acknowledged by the Participants, who state that, "If data volumes continue to increase as they have historically, the associated costs avoided would similarly increase." See Amendment, *supra* note 13, at 81123.

²¹⁵ This exchange is MIAX Sapphire, LLC. See *supra* note 4.

estimated, potentially increasing the storage footprint of Raw Unprocessed Data, Interim Operational Data, and/or submission and feedback files.²¹⁶

Cost savings from the provision on Raw Unprocessed, Interim Operational Data and/or submission and feedback files will be reduced by any data requests by regulators to restore such data.²¹⁷ Participants state that retrieving data from Glacier Deep Archive storage is costly and the costs are a function of the size of the data being pulled in addition to the speed with which the request must be fulfilled.²¹⁸ This \$1 million savings is also based, in part, on an expectation of usage of Raw Unprocessed, Interim Operational Data and/or submission and feedback files older than 15 days that matches the previous four years.²¹⁹ According to the Participants, these data were not used during the development of the CAT NMS Plan over the last four years.²²⁰

c. Implementation Costs

The Amendment states that “the one-time implementation costs are expected to be minimal relative to overall cost savings.”²²¹ While the Participants do not estimate implementation costs, the Commission can compare anticipated implementation activity to that of recent Commission final rules that include estimates for such activity. According to the Participants, “[o]ne-time implementation costs will generally consist of Plan Processor labor

²¹⁶ This exchange is 24X National Exchange LLC. See Securities Exchange Act Release No. 34-101777 (Nov. 27, 2024), 89 FR 97092 (Dec. 6, 2024).

²¹⁷ See Notice, supra note 9, at 26986, where the Participants state, “Upon request by the SEC or one of the Participants to the CAT Help Desk, archived data would be restored by the Plan Processor to an accessible storage tier, at which point it would be available and searchable electronically by regulatory users in the same manner it is today.”

²¹⁸ See Notice, supra note 9, at 26986.

²¹⁹ See Notice, supra note 9, at 26986.

²²⁰ See infra note 253 253and associated text.

²²¹ See Amendment, supra note 13, at 81123.

costs associated with coding and software development, as well as any related cloud feed associated with the development, testing and load testing of the proposed changes.”²²² The Participants state that, “[o]ngoing operational costs, other than cloud hosting costs,” will not be affected by the proposed amendments.²²³ The Commission agrees that the implementation costs seem minimal relative to overall cost savings.

The Proposal will result in costs to the Plan Processor with respect to developing policies and procedures, revising and testing coding changes, and revising user manuals and training materials. Policies and procedures will dictate how the Plan Processor responds to requests to restore the operational data and ensure confidentiality in the request.²²⁴ Implementing the Proposal will also require changes to programming code to change the processing of affected CAT Data. Finally, user manuals and training will have to be revised to ensure they reflect the CAT Data and access for regulators after the Proposal.

Table 2: Implementation Costs for Comparable Compliance Actions

Implementation Activity	Lowest Estimate	Highest Estimate
Developing Policies and Procedures ^a	\$49,000	\$53,000
Revising and Testing Code ^b	\$20,000	\$114,000

^aSee *infra* note 225.
^bSee *infra* note 226.

Table 2 shows ranges of implementation costs for implementation activities in recent Commission final rules. The Commission expects the Proposal to fall near the lower end of these ranges, and possibly below them. The estimates for developing policies and procedures in

²²² Id.

²²³ See Amendment, supra note 13, at 81123.

²²⁴ See Notice, supra note 9, at 26986.

Table 2 apply to policies and procedures that codify business practices,²²⁵ which would be a bigger effort than the policies and procedures for fulfilling requests to restore data. Second, the Commission expects the coding changes necessary to implement the Proposal to involve fewer labor hours than the comparison rules for revising code in Table 2.²²⁶ Finally, while the recent Commission final rules surveyed did not separately itemize the costs of revising user manuals and training (and thus are not included in Table 2), the Commission expects that the costs will be lower than the costs of developing policies and procedures.

²²⁵ See e.g., Standards for Covered Clearing Agencies for U.S. Treasury Securities and Application of the Broker-Dealer Customer Protection Rule with Respect to U.S. Treasury Securities, Release No. 34-99149 (Dec. 13, 2023), 89 FR 2714 (Jan. 16, 2024) (“Treasury Clearing Adopting Release”) at note 981 for the high estimate, rounded down from \$53,425; Covered Clearing Agency Resilience and Recovery and Orderly Wind-Down Plans, Release No. Securities Exchange Act Release No. 34-101446 (Oct. 25, 2024), 89 FR 91000 (Nov. 18, 2024) (“Covered Clearing Adopting Release”) at 183 for the low estimate.

²²⁶ Estimates for coding changes from recent Commission final rules vary based on programming staff labor from 50 hours for code revisions to calculate metrics to 300 hours for code revisions to accept new information in the CAT Central Repository. See Short Position and Short Activity Reporting by Institutional Investment Managers, Release No. 34-98738 (Oct. 13, 2023), 88 FR 75100 (Nov. 1, 2023) (the “Short Position Reporting Adopting Release”) at 75144, note 475 for the high estimate. Among other changes, this release amended section 6.4(d)(ii) of the CAT NMS Plan (the “Bona Fide Market Maker Amendment”) requiring the 25 Plan Participants to update their compliance rules by July 2. See Short Position Reporting Adopting Release, section VI for a discussion of the Bona Fide Market Maker Amendment. Implementing the Bona Fide Market Maker Amendment will involve approximately 300 labor hours spread across programming, database administration, business and legal personnel. The Commission anticipates that coding changes to implement the Proposal involve a similar mix of labor as in the Bona Fide Market Maker Amendment but will need fewer hours. For the low estimate, rounded down from \$20,075, see Disclosure of Order Execution Information, Release No. 34-99679 (March 6, 2024), 89 FR 26428 (April 15, 2024) (“Order Disclosure Adopting Release”), at 26499 note 951. These costs reflect approximately 50 labor hours spread across programming and compliance personnel. While the amendments in the Commission’s recent Order Disclosure Adopting Release involve entities other than the Central Repository, the types of coding revisions may involve a similar effort. These numbers are rounded to the nearest thousand to reflect imprecision.

The Commission understands, from Staff discussions with the Participants, that moving data to Glacier Deep Archive is a service provided by the cloud provider and, thus, costs are unaffected by the Proposal. In addition, the proposed amendments will not involve any costs of building security for the Glacier Deep Archive because the Plan Processor has already built such security measures.

As for ongoing implementation costs, the Proposal could result in ongoing costs related to an increase in help desk demands to assist regulatory staff requesting assistances in linking Options Market Maker quotes in Listed Options lifecycles, and restoration of Raw Unprocessed, Interim Operational Data and/or submission and feedback files older than 15 days.

d. Cost Transfers to Regulators

Regulators may undertake activities to mitigate the impact of the proposed amendments on regulatory activities and, as a result, incur costs. For regulatory activity that necessitates lifecycle information for Options Market Maker quotes in Listed Options, regulators could reduce the impact of the Proposal by revising lifecycle-producing code from the Plan Processor to apply it to their systems, maintaining such code over time, and processing data with that code.²²⁷ The cost of applying and maintaining the code as well as processing data with the code is a cost transfer from the Company to regulators. The magnitude of this cost depends on the complexity of revising the code for regulators' systems, the frequency of updates required to maintain the code, and the chosen amount and frequency of data processed. In addition, regulators could incur staffing costs to mitigate the loss of data in DIVER and MIRS query tools²²⁸ and to request restorations of Raw Unprocessed, Interim Operational Data and/or

²²⁷ See infra section III.C.2.a.(i).

²²⁸ See infra section III.C.2.a.(ii) for a discussion of the impact of the provision that Options Market Maker quotes in Listed Options will no longer be available in DIVER.

submission and feedback files older than 15 days. The costs incurred by regulators would reduce the cost savings of the proposed amendments. However, cost savings would still be meaningful after taking these transfers into consideration.

e. Interaction with Tick Size Adopting Release

One commenter stated that the rules and amendments proposed in the Tick Size Proposing Release²²⁹ (the “Proposed Tick Size Rules”) had “the potential to significantly expand the amount of quoting activity in the...listed options markets,”²³⁰ implying that the costs of linking Options Market Maker quotes in Listed Options would increase following the implementation of the Proposed Tick Size Rules. The commenter did not provide an explanation as to why they expected the Proposed Tick Size Rules would increase Options Market Maker quotes in Listed Options, and while the Commission has considered this potential interaction, it finds the connection is unclear. Regardless, the cost savings in the Proposal will still be meaningful as to all Options Market Maker quotes in Listed Options.

2. Regulatory efficiency

Regulatory efficiency refers to the efficiency of regulatory activities conducted by SROs and/or the Commission necessary to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.²³¹ In analyzing how the Proposal will impact

²²⁹ See Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders, Release No. 34-96494 (Dec. 14, 2022), 87 FR 80266 (Dec. 29, 2022) (“Tick Size Proposing Release”).

²³⁰ See SIFMA Letter I, supra note 68, at 2, stating that “the [quote-to-trade ratio] is nearly 4 times greater than the ratio. described in the SEC’s approval order,” and citing to the tick size proposal in stating that “certain SEC market structure initiatives might only accelerate the increase.”

²³¹ See CAT NMS Plan Approval Order, supra note 3, at 84833-84840 for a discussion of the benefits from the types of regulatory activities that the CAT NMS Plan was intended to improve.

regulatory efficiency, the Commission assessed how the Proposal will impact regulatory activities.

The Commission identified regulatory inefficiencies resulting from the Proposal. Most of these regulatory inefficiencies are transitional.²³² The other regulatory inefficiencies will be permanent in nature and will occur each time certain regulatory use cases arise.²³³ The Commission concludes that the regulatory inefficiencies will have a limited overall impact.

a. Options Market Maker Quotes in Listed Options

The Participants state that the provision of the proposed amendments involving Options Market Maker quotes in Listed Options will have a “limited impact on the regulatory function of the CAT.” The Commission expects that this provision will delay potential regulatory activities involving lifecycle linkages for Options Market Maker quotes in Listed Options and reduce the accessibility of Options Market Maker quotes in Listed Options.²³⁴ The Commission expects the mitigation mechanisms – e.g., the provision of code from the Plan Processor and the use of the quoteID field – to partially alleviate the delays created by the Proposal.²³⁵ The removal of Options Market Maker quotes from DIVER will result in certain regulatory inefficiencies; most of these inefficiencies, however, will dissipate in the long run.²³⁶

(i) Cessation of processing of Options Market Maker quotes by the Plan Processor

²³² See infra section III.C.2.a.(ii).

²³³ For example, each time a regulator has to create lifecycles for a set of Options Market Maker quotes. See infra section III.C.2.a.(i).

²³⁴ The lifecycle linkages and derived fields will not be available as they will not be produced and while the unprocessed Options Market Maker quotes in Listed Options will remain in the CAT Data they will no longer be available in DIVER.

²³⁵ The field quoteID is the internal ID assigned to the order/quote by the exchange.

²³⁶ See infra notes 252251-253252, and associated text.

The loss of the linkage processing and derived fields specified in the Proposal could adversely affect investigations, examinations, or market analyses that rely on the lifecycle information in Options Market Maker data in CAT.²³⁷ When the Plan Processor ceases lifecycle processing on Options Market Maker quotes in Listed Options, CAT Data will no longer include a CAT-Lifecycle-ID. The absence of CAT-Lifecycle-IDs for Options Market Maker quotes will delay any regulatory activities involving order linkages for Options Market Maker quotes in Listed Options.²³⁸ Lack of lifecycle linkages would also preclude derived fields such as Derived Next Event Timestamp (and Type Code) from being used by regulators to make regulatory activities, such as order book reconstructions, easier and faster.

To mitigate the impact of this provision, regulators will have the option of requesting from the Plan Processor the code underlying the current linkage processing for Options Market Maker quotes in Listed Options for the purpose of creating the lifecycles and derived fields themselves.²³⁹ While such code could be helpful, it may also need to be modified by regulators to run on their own systems. Further, the Plan Processor will not update this code over time, and thus, regulators will need to maintain it themselves.²⁴⁰ Also, the processing and maintenance of

²³⁷ See, e.g., CAT NMS Plan Approval Order, supra note 3, at 84826-84827, 84831-84832, 84834 and 84839 for a discussion of the benefits of linking order data.

²³⁸ See CAT NMS Plan Approval Order, supra note 3, at 84834-84840 for examples of regulatory activities improved by having ready access to linkage information. Types of regulatory activities include analysis and reconstruction of market events, market analysis and research, and surveillance and investigations (SRO surveillance, SRO and Commission examinations, and SRO and Commission enforcement investigations). Regulatory activities involving Options Market Maker quotes in Listed Options can fall into any of these activities.

²³⁹ See supra note 82 and associated text. See also Notice, supra note 9, at 26984; Participant Letter, supra note 32, at 5-6.

²⁴⁰ See supra note 41. The Plan Processor technicians presumably have more expertise on particular changes to CAT Data affecting their linkage code than data users at SROs or the Commission.

lifecycle linkages of Options Market Maker quotes in Listed Options will shift from a single entity (the Plan Processor) to multiple regulators. Such decentralization could result in duplicative efforts across regulators.

The Commission recognizes that potential delays depend on how complex the linkage processes are. A simpler linkage process will reduce the inefficiencies associated with decentralization and stale code. The Participants stated that “the vast majority of options market maker quote lifecycles consist of just two events,”²⁴¹ and that “[e]xecutions that result from Options Market Maker quotes will identify the quoteId of the quote that resulted in an execution,”²⁴² which suggests that these quotes have simple lifecycle processing.

While the majority of lifecycles of Options Market Maker quotes in Listed Options, with or without trades, may contain only two events, a substantial number of lifecycles could be more complex.²⁴³ The Proposal further states that a large portion of lifecycles of Options Market Maker quotes in Listed Options do not involve any execution or allocation.²⁴⁴ However, regulatory activities that analyze lifecycles or reconstruct order books are not restricted to lifecycles that contain trades.

Similarly, while having a quoteID on all options events in the lifecycle of an Options Market Maker quote in Listed Options can simplify the process of linking events,²⁴⁵ quote ID does not fully substitute for CAT-Lifecycle-ID in all instances. An analysis of the effectiveness

²⁴¹ See Notice, supra note 9, at 26984.

²⁴² Id. In addition, the Participants stated that “[l]inkage validation is not necessary for Options Market Maker [q]uotes because quoteID is an effective replacement for tying quotes to trades.” See Participant Letter, supra note 32, at 4.

²⁴³ See section III.B, supra note 182 and associated text.

²⁴⁴ See Participant Letter, supra note 32, at 2.

²⁴⁵ See Participant Letter, supra note 32, at 4; see also Notice, supra note 9, at 26984.

of quoteID in linking trades to quotes, and linking lifecycles more generally, found that quoteID is approximately 95 percent as effective as CAT-Lifecycle-ID is.²⁴⁶

Resulting delays from the implementation of the Proposal will vary across the impacted regulatory activities. Certain analyses using high volumes of data (e.g., the January 2021 volatility²⁴⁷) are more likely to face a large number of disparate complexities in linkage processing, which could take more time to address. Also, in these cases, the aforementioned challenges in using quoteID and Plan Processor code could be significant if such regulatory activities are time-sensitive. The implementation of the Proposal likely will have a limited impact for regulatory activities that focus on small samples,²⁴⁸ where the Plan Processor's code and quoteID may be sufficient to avoid meaningful delays associated with linkage complexities.

(ii) Loss of Options Market Maker quotes in Listed Options in tools such as DIVER and MIRS

²⁴⁶ For the purpose of this Order, using a day's trading (the day of March 7, 2024), 2,706,647 options trade events linked to Options Market Maker quotes were analyzed. The analysis focused on whether the lifecycles (using CAT Lifecycle IDs) contained information sufficient for regulators to create the lifecycles themselves, absent the CAT Lifecycle ID. The analysis studied the linkages using a combination of Exchange ID, OSI Symbol ID, quoteID, Side, and Event Date and found that 142,578 (approximately 5 percent) trades did not contain information sufficient to link to the quote (if not using the CAT-Lifecycle-ID). For any remaining unlinked trades, other elements of the linkage processing currently used by the Plan Processor might offer additional means or methods for linking trades to quotes once the Proposal is implemented. Also, regulators may be able to obtain the information necessary to link trades to quotes by making information requests to the relevant Market Makers and/or exchanges. However, this would involve significant delays.

²⁴⁷ See Staff Report on Equity and Options Market Structure Conditions in Early 2021, (Oct. 14, 2021) available at <https://www.sec.gov/files/staff-report-equity-options-market-structure-conditions-early-2021.pdf>.

²⁴⁸ A small sample, for example, could involve trades on a particular day, in a specific option contract by a specific market maker.

The provision of the proposed amendments involving the Options Market Maker quotes in Listed Options will also eliminate Options Market Maker quotes in Listed Options from DIVER. The Participants state that, “[t]he regulatory groups of each of the Participants have indicated that they are able to conduct their regulatory programs accessing Options Market Maker Quotations via BDSQL and/or Direct Read, and each group supports the proposed modification.”²⁴⁹

The loss of Options Market Maker quotes in Listed Options from DIVER may delay regulatory activities, at least in the short-term. While use of DIVER does not require programming skills in remote data processing and/or knowledge of structured query programming language,²⁵⁰ regulatory users seeking to access Options Market Maker quotes in Listed Options will now have to do so through BDSQL and Direct Read, which do require such specialized skills and are therefore less user-friendly.²⁵¹ This may create some inefficiencies in the short term for regulatory activities involving Option Market Maker quotes.²⁵² Over a longer

²⁴⁹ See Participant Letter, supra note 32, at 5.

²⁵⁰ See supra note 174, and associated text.

²⁵¹ The Commission previously discussed the economic impact of how user-friendly CAT access tools would be. In discussing how the CAT NMS Plan would improve the accessibility of regulatory data by providing regulators with direct access to the consolidated CAT Data, the Commission stated that improving accessibility of regulatory data over the regulatory baseline requires ensuring that enough SRO and Commission staff members are able to use the [access] system supplied by the Central Repository when they need it. The Commission also discussed its belief that the ability to use the direct access system depends, among other things, on how user-friendly the system is. See Securities Exchange Act Release No. 34-77724 (April 27, 2016), 81 FR 30614 (May 17, 2016) at 30689.

²⁵² Some regulatory users might have to rely on regulatory users with programming skills to assist them in affected regulatory activities. This could increase the workload of regulatory users with programming skills and slow down other regulatory activities involving CAT. In addition, regulators would spend more time writing code to pull data from BDSQL than they expend to select from among the pre-defined criteria in DIVER.

term, however, some regulatory users may become more familiar with BDSQL and Direct Read. Further, regulators could also adjust by creating internal tools for to replicate the same targeted queries they would otherwise run on DIVER. Once the code has been written out, BDSQL would likely be less time-consuming compared to DIVER, which can offset the delays. However, this could result in another inefficiency should multiple SROs and the Commission create code to replicate the commonly-used functionality formerly centralized within DIVER.

b. Raw Unprocessed, Interim Operational Data and/or submission and feedback files

Based on the potential future use of Raw Unprocessed, Interim Operational Data and/or submission and feedback files older than 15 days, as well as the Participants' statements on past use, the Commission expects the Proposal not to have a consequential negative impact on regulatory efficiency. Some future regulatory activities of SROs could depend on the use of the Raw Unprocessed, Interim Operational Data and/or submission and feedback files older than 15 days, and therefore may be affected by a delay in access to data. It could, for example, be used by SROs to investigate patterns of errors in CAT Data submissions by their members.²⁵³ However, such regulatory activities are unlikely to be time-sensitive.

3. Market Efficiency

Market efficiency could be slightly negatively impacted by the Proposal with the impact coming from reductions in regulatory efficiency.²⁵⁴ Since the impact of the Proposal on

²⁵³ See supra note 120 and associated text. The Proposal could delay Designated Examining Authorities (“DEAs”) examinations of CAT reporting errors by their members if these examinations require restoring data.

²⁵⁴ See supra sections III.C.2.a. and III.C.2.b. for the impact of the Amendment on regulatory efficiency. The impact on CAT data in terms of reduced accessibility and timeliness could lead to a modest reduction in the deterrence effects of CAT. See CAT NMS Plan Approval Order, supra note 3, at 84836, note 2266. The reduced timeliness could also allow violative behaviors to persist for slightly longer.

regulatory efficiency is limited, the impact on market efficiency will be minimal. There could also be minor improvements in market efficiency due to a reduction in CAT fees.²⁵⁵

D. Competition

The Participants believe that the Proposal will have a positive impact on competition.²⁵⁶ The Commission expects that the Proposal is likely to result in slightly reduced CAT fees, which could dampen existing competitive advantages for some market participants relative to the baseline,²⁵⁷ but this is unlikely to have a meaningful effect on competition.²⁵⁸ To the extent that the Proposal results in a modest reduction in the deterrence effects of CAT and a potential increase in persistence of violative behaviors,²⁵⁹ there could be a resulting small adverse effect on competition in the market for trading services.²⁶⁰ None of these effects on competition, however, is likely to be meaningfully large.

²⁵⁵ The CAT Funding Approval Order concludes that the expected magnitude of CAT Fees “are expected to be relatively small” based on a comparison of illustrative fees to other per share transaction costs. See CAT Funding Model Approval Order, supra note 162, at 62682. Therefore, a reduction in CAT fees would also be small when distributed on a per share basis.

²⁵⁶ See Notice, supra note 9, at 26989.

²⁵⁷ The CAT Funding Model establishes the framework under which CAT costs will be allocated among Participants and Industry Members, resulting in competitive advantages for some Participants and Industry Members over others. Such competitive advantages are dampened by a reduction in CAT costs as a result of the Proposal. See CAT Funding Model Approval Order, supra note 162, at 62684-62685.

²⁵⁸ See supra section III.C.3. for a discussion of why the reduction in fees will likely be small.

²⁵⁹ See supra note 254254.

²⁶⁰ A reduction in the deterrence effects of CAT and a potential increase in the persistence of violative behaviors could impact the market for trading services. See supra note 254 for a discussion of the effect of the Proposal on deterrence; see also CAT NMS Plan Approval Order, supra note 3, at 84885.

E. Capital Formation

The Participants state that the Proposal will have a positive impact on capital formation.²⁶¹ While they do not explain the mechanism, they state that the savings under the proposed amendments will “inure to the benefit of all participants in the markets for NMS Securities and OTC Equity Securities, including Participants, Industry Members, and most importantly, the investors.”²⁶² The Commission does not expect that the cost savings will result in any meaningful positive impact on capital formation.²⁶³ In addition, any adverse impact on capital formation resulting from the regulatory inefficiencies created by the proposed amendments will also be small.²⁶⁴

IV. Conclusion

For the reasons discussed, the Commission, pursuant to Section 11A of the Exchange Act,²⁶⁵ and Rule 608(b)(2)²⁶⁶ thereunder, is approving the proposed changes to the CAT NMS Plan, as those changes are set forth in the Proposal. Section 11A of the Exchange Act authorizes the Commission, by rule or order, to authorize or require the self-regulatory organizations to act jointly with respect to matters as to which they share authority under the Exchange Act in planning, developing, operating, or regulating a facility of the national market system.²⁶⁷ Rule

²⁶¹ See Notice, supra note 9, at 26989.

²⁶² Id.

²⁶³ See supra note 255 for why CAT fees, which are passed on to market participants, are unlikely to be meaningfully lowered on a per share basis under the Proposal.

²⁶⁴ Violative behavior could persist longer as a result of a decrease in timeliness of regulatory actions. However, the effect on regulatory actions is likely to be small. Therefore, the effect on capital formation is likely to be small.

²⁶⁵ 15 U.S.C. 78k-1.

²⁶⁶ 17 CFR 242.608(b)(2).

²⁶⁷ See 15 U.S.C. 78k-1(a)(3)(B).

608 of Regulation NMS authorizes two or more SROs, acting jointly, to file with the Commission proposed amendments to an effective NMS plan,²⁶⁸ and further provides that the Commission shall approve an amendment to an effective NMS plan if it finds that the amendment is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Exchange Act.²⁶⁹

For the reasons set forth above, the Commission finds that the proposed changes to the CAT NMS Plan, as set forth in the Proposal, meet the required standard.

IT IS THEREFORE ORDERED, pursuant to Section 11A of the Exchange Act,²⁷⁰ and Rule 608(b)(2)²⁷¹ thereunder, that such changes be, and hereby are, approved.

By the Commission.

Sherry R. Haywood,

Assistant Secretary.

²⁶⁸ See 17 CFR 242.608.

²⁶⁹ See 17 CFR 242.608(b)(2).

²⁷⁰ 15 U.S.C. 78k-1.

²⁷¹ 17 CFR 242.608(b)(2).