SECURITIES AND EXCHANGE COMMISSION

17 CFR Part 242

[Release No. 34–96493; File No. S7–29–22]

RIN 3235–AN22

Disclosure of Order Execution Information

AGENCY: Securities and Exchange Commission.

ACTION: Proposed rule.

SUMMARY: The Securities and Exchange Commission (''Commission'' or ''SEC'') is proposing to amend existing requirements under the Securities Exchange Act of 1934 (''Exchange Act'') to update the disclosure required for order executions in national market system (''NMS'') stocks. First, the Commission is proposing to expand the scope of reporting entities subject to the rule that requires market centers to make available to the public monthly execution quality reports to encompass broker-dealers with a larger number of customers. Next, the Commission is proposing to modify the definition of ''covered order'' to include certain orders submitted outside of regular trading hours and certain orders submitted with stop prices. In addition, the Commission is proposing modifications to the information required to be reported under the rule, including changing how orders are categorized by order size as well as how they are categorized by order type. As part of the changes to these categories, the Commission is proposing to capture execution quality information for fractional share orders, odd-lot orders, and larger-sized orders. Additionally, the Commission is proposing to modify reporting requirements for non-marketable limit orders (''NMLOs'') in order to capture more relevant execution quality information for these orders by requiring statistics to be reported from the time such orders become executable. The Commission is also proposing to eliminate time-to-execution categories in favor of average time to execution, median time to execution, and 99th percentile time to execution, each as measured in increments of a millisecond or finer and calculated on a share-weighted basis. In order to better reflect the speed of the marketplace, the Commission is proposing that the time of order receipt and time of order execution be measured in increments of a millisecond or finer, and that realized spread be calculated at both 15 seconds and one minute. Finally, the Commission is proposing to enhance the accessibility of the required reports by requiring all reporting entities to make a summary report available.

DATES: Comments should be received on or before March 31, 2023.

ADDRESSES: Comments may be submitted by any of the following methods:

Electronic Comments

- Use the Commission's internet comment form (*http://www.sec.gov/rules/submitcomments.htm*); or
- Send an email to *rule-comments@sec.gov.* Please include File Number S7–29–22 on the subject line.

Paper Comments

- Send paper comments to Secretary, Securities and Exchange Commission, 100 F Street NE, Washington, DC 20549–1090.

All submissions should refer to File Number S7–29–22. This file number should be included on the subject line if email is used. To help the Commission process and review your comments more efficiently, please use only one method of submission. The Commission will post all comments on the Commission's website (*http://www.sec.gov/rules/proposed.shtml*). Comments are also available for website viewing and printing in the Commission's Public Reference Room, 100 F Street NE, Washington, DC 20549, on official business days between the hours of 10 a.m. and 3 p.m. Operating conditions may limit access to the Commission's Public Reference Room. All comments received will be posted without change. Persons submitting comments are cautioned that we do not redact or edit personal identifying information from comment submissions. You should submit only information that you wish to make available publicly.

Studies, memoranda, or other substantive items may be added by the Commission or staff to the comment file during this rulemaking. A notification of the inclusion in the comment file of any materials will be made available on the Commission's website. To ensure direct electronic receipt of such notifications, sign up through the ''Stay Connected'' option at *www.sec.gov* to receive notifications by email.

FOR FURTHER INFORMATION CONTACT: Kathleen Gross, Senior Special Counsel, Lauren Yates, Senior Special Counsel, Christopher Chow, Special Counsel, or David Michehl, Special Counsel, at (202) 551–5500, Division of Trading and Markets, Commission, 100 F Street NE, Washington, DC 20549.

SUPPLEMENTARY INFORMATION: The Commission is proposing amendments to 17 CFR 242.600 of Regulation National Market System (''Regulation NMS'') under the Exchange Act (''Rule 600'') to add new defined terms to and modify certain existing defined terms in Rule 600 that are used in 17 CFR 242.605 of Regulation NMS under the Exchange Act (''Rule 605'' or ''Rule'') as proposed to be amended; as well as amendments to Rule 605.

Table of Contents

I. Introduction
II. Current Reporting of Execution Quality Statistics
A. Adoption of Rule 11Ac1–5
B. Scope and Content of Rule 605
1. Scope
2. Required Information
3. Procedures for Making Reports Available to the Public
C. Other Relevant Rules
D. Overview of Need for Modernization
E. EMSAC Recommendations, Petition for Rulemaking, and Other Comments
III. Proposed Modifications to Reporting Entities
A. Larger Broker-Dealers
B. Qualified Auction Mechanisms
C. ATSs and Single-Dealer Platforms
IV. Proposed Modifications to Scope of Orders Covered and Required Information
A. Covered Order
1. Orders Submitted Pre-Opening/Post-Closing
2. Stop Orders
3. Non-Exempt Short Sale Orders
B. Required Information
1. Categorization by Order Size
2. Categorization by Order Type
3. Timestamp Conventions
4. Changes to Information Required for All Types of Orders
5. Additional Required Information for Market, Marketable Limit, Marketable IOC, and Beyond-the-Midpoint Limit Orders
6. Additional Required Information for Executable NMLOs, Executable Stop Orders, and Beyond-the-Midpoint Limit Orders
V. Proposed Summary Execution Quality Reports
VI. Paperwork Reduction Act
A. Summary of Collection of Information
B. Proposed Use of Information
C. Respondents
D. Total PRA Burdens
E. Request for Comment
VII. Economic Analysis
A. Introduction
B. Market Failure
C. Baseline
1. Regulatory Baseline
2. Current Rule 605 Disclosure Requirements
3. Markets for Brokerage and Trading Services for NMS Stocks Under Current Rule 605 Disclosure Requirements
D. Economic Effects
1. Benefits
2. Costs

3. Economic Effects on Efficiency, Competition, and Capital Formation
E. Reasonable Alternatives
1. Reasonable Alternative Modifications to Reporting Entities
2. Reasonable Alternative Modifications to Scope of Covered Orders
3. Reasonable Alternative Modifications to Required Information
4. Reasonable Alternative Modifications to Accessibility
5. Other Reasonable Alternatives
F. Request for Comment
VIII. Consideration of Impact on the Economy
IX. Initial Regulatory Flexibility Analysis
Statutory Authority and Text of Proposed Rule

I. Introduction

The Commission is proposing to update the requirements to disclose order execution information under Rule 605. Currently, market centers that execute investor orders are required to make monthly disclosures of basic information concerning their quality of executions. The required disclosures have provided significant insight into execution quality at different market centers; however, both the scope and the content of Rule 605 reports have not kept pace with technological and market developments. The proposal would require broker-dealers with a larger number of customers (''larger broker-dealers'') [1] to prepare execution quality reports, would capture execution quality information for more order types and sizes, and would require time-based metrics to be recorded at a more granular level that reflects current market speed. By providing more relevant and accessible metrics, the proposal would better promote competition among market centers and broker-dealers on the basis of execution quality and ultimately improve the efficiency of securities transactions, consistent with the national market system objectives.[2]

The national market system objectives of section 11A of the Exchange Act include the economically efficient executions of securities transactions; fair competition among brokers and dealers, among exchange markets, and between exchange markets and markets other than exchange markets; the availability of information on securities quotations and transactions; and the practicability of brokers executing investor orders in the best market.[3] These objectives guide the Commission as it seeks to ensure market structure rules keep pace with continually changing economic conditions and technological advancements. However, these objectives, in particular the goal of promoting opportunities for the most willing seller to meet the most willing buyer (*i.e.,* order interaction) and the goal of promoting competition among markets, can be difficult to reconcile.[4] The Rule, along with 17 CFR 242.606 (''Rule 606'') of Regulation NMS, was adopted in 2000 and together these rules required the public disclosure of execution quality and order routing practices.[5] In adopting these rules, the Commission recognized the importance of vigorous competition among buyers and sellers in an individual security.[6] However, the Commission also recognized the importance of competition among market centers, which entails some fragmentation of order flow.[7] Such competition has benefits to investors including the development of innovative trading services, lower fees, and faster executions.[8] The Commission characterized the rules as a ''minimum step necessary to address fragmentation'' [9] and stated that by making visible the execution quality of the securities markets, the rules are intended to spur more vigorous competition among market participants to provide the best possible prices for investor orders.[10]

Although the Rule has provided visibility into execution quality at different market centers, the content of the disclosures required by the Rule has not been substantively updated since the Rule was adopted in 2000.[11] Changed equity market conditions and technological advancements have eroded the utility of the Rule. The speed and nature of trading have changed dramatically as a result of technological improvements and the markets' response to the changing regulatory landscape.[12] Trading has moved from being concentrated on a given security's listing exchange [13] to being spread across a highly fragmented market where national securities exchanges, alternative trading systems (''ATSs''), single-dealer platforms (''SDPs''), off-exchange market makers, and others compete for order flow. Orders may be matched, routed, or cancelled in microseconds and market information is transmitted nearly instantaneously. At the same time, individual investor [14] participation in the equity markets has increased.[15] Further, the average share prices of certain stocks have continued to increase over time.[16]

The Commission continues to believe that facilitating the ability of the public to compare and evaluate execution quality among different market centers is an effective means of reconciling the need to promote both vigorous price competition and fair competition among market centers. Providing increased visibility into the execution quality of larger broker-dealers would similarly encourage competition among market participants. It is the Commission's task continually to monitor market conditions and competitive forces and to evaluate whether the structure of the national market system as it evolves is achieving its Exchange Act objectives.[17] Section 11A of the Exchange Act [18] grants the Commission authority to promulgate rules necessary or appropriate to assure the fairness and usefulness of information on securities

[1] Throughout the release, the term ''larger broker-dealer'' refers to a broker-dealer that meets or exceeds the ''customer account threshold,'' as defined in proposed Rule 605(a)(7). *See also infra* section III.A (discussing proposed Rule 605(a)(7)).

[2] 15 U.S.C. 78k–1.

[3] *See* 15 U.S.C. 78k–1(a)(1)(C).

[4] *See* Securities Exchange Act Release No. 61358 (Jan. 14, 2010), 75 FR 3594, 3597 (Jan. 21, 2010) (''Concept Release on Equity Market Structure'').

[5] *See* Securities Exchange Act Release No. 43590 (Nov. 17, 2000), 65 FR 75414, 75416 (Dec. 1, 2000) (Disclosure of Order Execution and Routing Practices) (''Adopting Release'').

[6] *See id.* at 75415.

[7] *See id.* at 75416.

[8] *See id.*

[9] *Id.*

[10] *See id.* at 75414.

[11] In 2018, the Commission amended Rule 600, 605, and 606 of Regulation NMS (''the 2018 Rule 606 Amendments''). The 2018 Rule 606 Amendments modified Rule 605 to require that the public order execution quality reports be kept publicly available for a period of three years. *See* Securities Exchange Act Release No. 84528 (Nov. 2, 2018), 83 FR 58338 (Nov. 19, 2018) (''2018 Rule 606 Amendments Release'').

[12] For example, since the adoption of the Rule in 2000, the Commission has periodically revised certain of its NMS rules, including the adoption of Regulation NMS in 2005. *See, e.g.,* Securities Exchange Act Release Nos. 51808 (June 9, 2005), 70 FR 37496 (June 29, 2005) (''Regulation NMS Adopting Release''); and 90610 (Dec. 9, 2020), 86 FR 18596 (Apr. 9, 2021) (''MDI Adopting Release'').

[13] For example, in January 2005, the New York Stock Exchange Inc. (''NYSE'') executed approximately 79.1% of the consolidated share volume in its listed stocks, compared to 25.1% in October 2009. *See* Concept Release on Equity Market Structure, 75 FR 3594 (Jan. 21, 2010) at 3595.

[14] As used in this release, the term ''individual investor'' will refer to natural persons that trade relatively infrequently for their own or closely related accounts.

[15] *See, e.g.,* Caitlin McCabe, ''New Army of Individual Investors Flexes Its Muscle,'' The Wall Street Journal (Dec. 30, 2020), *available at https://www.wsj.com/articles/new-army-of-individual-investors-flexes-its-muscle-11609329600.*

[16] *See* MDI Adopting Release, 86 FR at 18606–07 (citing Securities Exchange Act Release No. 88216 (Feb. 14, 2020), 85 FR 16726, 16739 (Mar. 24, 2020) (''MDI Proposing Release'') (stating that ''between 2004 and 2019, the average price of a stock in the Dow Jones Industrial Average nearly quadrupled'')).

[17] *See* Securities Exchange Act Release No. 42450 (Feb. 23, 2000), 65 FR 10577, 10585 (Feb. 28, 2000) (''Fragmentation Release'').

[18] 15 U.S.C. 78k–1.

transactions [19] and to assure that broker-dealers transmit and direct orders for the purchase or sale of qualified securities in a manner consistent with the establishment and operation of a national market system.[20] Through the proposed updates to Rule 605, the Commission seeks to promote increased transparency of order execution quality, increase the information available to investors, and help to promote competition among market centers and broker-dealers, while ameliorating the potentially adverse effects of fragmentation on efficiency, price transparency, best execution of investor orders, and order interaction.[21]

II. Current Reporting of Execution Quality Statistics

A. Adoption of Rule 11Ac1–5

When the Commission adopted Rule 11Ac1–5, which was later re-designated as Rule 605, in 2000, there was little publicly available information to enable investors to compare and evaluate execution quality among different market centers.[22] The Commission proposed and adopted Rule 11Ac1–5 together with Rule 11Ac1–6, which was later re-designated as Rule 606, requiring broker-dealers to disclose the identity of market centers to which they route orders on behalf of customers. When adopting these rules, the Commission stated that, taken together, they should significantly improve the opportunity for investors to evaluate what happens to their orders after they submit them to a broker-dealer for execution.[23] The Commission reasoned that competitive forces could then be brought to bear on broker-dealers both with respect to the explicit trading costs associated with brokerage commissions and the implicit trading costs associated with execution quality.[24] Rule 11Ac1–5 was intended to remedy an absence of public information about how broker-dealers responded to trade-offs between price and other factors, such as speed or reliability, and establish a baseline level of disclosure in order to facilitate cross-market comparisons of execution quality.[25]

B. Scope and Content of Rule 605

1. Scope

Currently, Rule 605 requires market centers to make available, on a monthly basis, standardized information concerning execution quality for covered orders in NMS stocks that they received for execution. Market centers must provide specified measures of execution quality, including effective spread, average amount of price improvement, number of shares executed, and speed of execution.[26]

(a) Market Centers

Regulation NMS defines the term ''market center'' to mean any exchange market maker,[27] OTC market maker,[28] ATS,[29] national securities exchange,[30] or national securities association.[31] This definition was intended to cover entities that hold themselves out as willing to accept and execute orders in NMS securities.[32] Further, a market center must report on orders that it ''received for execution from any person,'' which was intended to assign the disclosure obligation to an entity that controls whether and when an order will be executed.[33]

In many instances, broker-dealers accept orders from customers for execution and then route these customer orders to various execution venues, but do not execute customer orders directly. These broker-dealers generally do not fall within the definition of ''market center'' and therefore fall outside of the scope of Rule 605's reporting requirements.[34]

(b) Covered Orders

The covered order definition is limited by several conditions and exclusions in order to include those orders that provide a basis for meaningful and comparable statistical measures of execution quality. A ''covered order'' is defined to include any market order or any limit order (including immediate-or-cancel orders) received by a market center during regular trading hours at a time when the national best bid and national best offer is being disseminated, and, if executed, is executed during regular trading hours.[35] This definition serves two purposes: (1) because the nature and execution quality for regular and after-hours trading differs, it avoids blending statistics for orders executed after-hours with those executed during the regular

[19] 15 U.S.C. 78k–1(c)(1)(B).

[20] 15 U.S.C. 78k–1(c)(1)(E).

[21] *See* Concept Release on Equity Market Structure, 75 FR 3594 (Jan. 20, 2010) at 3597.

[22] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75416. For clarity, when this release discusses the adoption of Rule 605, it is referring to the Adopting Release, *supra* note 5.

[23] *See id.* at 75414.

[24] *See id.* at 75419. Although it is difficult to isolate the effects of the Rule given the evolution of the equity markets over time, one academic study examining the introduction of Rule 605 found that the routing of marketable order flow by broker-dealers became more sensitive to changes in execution quality across market centers after Rule 605 reports became available. *See* Ekkehart Boehmer, Robert Jennings & Li Wei, *Public Disclosure and Private Decisions: Equity Market Execution Quality and Order Routing,* 20 Rev. Fin. Stud. 315 (2007) (''Boehmer et al.''). Another study attributed a significant decline in effective and quoted spreads following the implementation of Rule 605 to an increase in competition between market centers, who improved the execution quality that they offered in order to attract more order flow. *See* Xin Zhao & Kee H. Chung, *Information Disclosure and Market Quality: The Effect of SEC Rule 605 on Trading Costs,* 42 J. Fin. Quantitative Analysis, 657 (Sept. 2007) (''Zhao & Chung'').

[25] *See Adopting Release, 65 FR* 75414 (Dec. 1, 2000) at 75418, 75419. Data obtained from Rule 605 reports are used by the third parties including academics and the financial press to study a variety of topics related to execution quality, including liquidity measurement, exchange competition, zero commission trading, and broker-dealer execution quality. *See infra* notes 545–547 and accompanying text.

[26] *See* 17 CFR 242.605.

[27] ''Exchange market maker'' means any member of a national securities exchange that is registered as a specialist or market maker pursuant to the rules of such exchange. *See* 17 CFR 242.600(b)(32).

[28] ''OTC market maker'' means any dealer that holds itself out as being willing to buy from and sell to its customers, or others, in the United States, an NMS stock for its own account on a regular or continuous basis otherwise than on a national securities exchange in amounts of less than a block size. *See* 17 CFR 242.600(b)(64).

[29] ''Alternative trading system'' or ''ATS'' means any organization, association, person, group of persons, or system: (1) That constitutes, maintains, or provides a market place or facilities for bringing together purchasers and sellers of securities or for otherwise performing with respect to securities the functions commonly performed by a stock exchange within the meaning of 17 CFR 240.3b–16; and (2) That does not: (i) Set rules governing the conduct of subscribers other than the conduct of such subscribers' trading on such organization, association, person, group of persons, or system; or (ii) Discipline subscribers other than by exclusion from trading. *See* 17 CFR 242.300(a). *See also* 17 CFR 242.600(b)(4) (stating that ''alternative trading system'' has the meaning provided in 17 CFR 242.300(a)).

[30] ''National securities exchange'' means any exchange registered pursuant to section 6 of the Exchange Act. *See* 17 CFR 242.600(b)(53).

[31] *See* 17 CFR 242.600(b)(46). ''National securities association'' means any association of brokers and dealers registered pursuant to section 15A of the Exchange Act. *See* 17 CFR 242.600(b)(52).

[32] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421.

[33] *See id.*

[34] *See, e.g.,* 17 CFR 242.605(a) (monthly electronic reports by market centers). In some instances, broker-dealers accept orders from customers for execution and execute a small portion of their order flow internally (*e.g.,* fractional share orders), and therefore would fall within the definition of ''market center'' in Rule 600(b)(46) with respect to the portion of their order flow for which they hold themselves out as being willing to buy or sell for their own account on a regular or continuous basis. However, if, for example, they only act as a market center for orders smaller than 100 shares, then these market centers would not be required to prepare Rule 605 reports currently because the portion of their order flow for which they act as a market center would include only orders that fall below the smallest order size category (*i.e.,* 100 to 499 shares). *See* 17 CFR 242.600(b)(defining ''categorized by order size''); 17 CFR 242.605)(a)(1) (stating that a market center's monthly report ''shall be categorized by security, order type, and order size'').

[35] *See* 17 CFR 242.600(b)(22).

trading day; and (2) because many of the statistical measures included in the rule rely on the availability of the national best bid and offer (''NBBO'') at the time of order receipt, it excludes orders for which execution quality metrics could not be calculated.

Covered orders do not include any orders for which the customer requests special handling, which include, but are not limited to, market on open and market on close orders, stop orders, all or none orders, and ''not held'' orders.[36] The Commission reasoned that special handling instructions could skew general execution quality measures.[37]

2. Required Information

Rule 605 reports contain a number of execution quality metrics for covered orders, including statistics for all NMLOs with limit prices within ten cents of the NBBO at the time of order receipt as well as separate statistics for market orders and marketable limit orders. Under the Rule, the information is categorized by (1) individual security,[38] (2) one of five order types,[39] and (3) one of four order sizes.[40] These categories provide users flexibility in determining how to summarize and analyze the information.[41]

Within each of the three categories, the reports are required to include statistics about the total number of orders submitted as well as the total number of shares submitted, shares cancelled prior to execution, shares executed at the receiving market center, shares executed at another venue, shares executed within different time-to-execution buckets, and average realized spread.[42] For market and marketable limit orders, the reports also must include average effective spread; number of shares executed better than the quote, at the quote, or outside the quote; average time to execution when executed better than the quote, at the quote, or outside the quote; as well as average dollar amount per share that orders were executed better than the quote or outside the quote.[43] In addition, time of order execution and time of order receipt are required to be measured to the nearest second.[44]

The categorization by order type does not currently include away-from-the-quote NMLOs, *i.e.,* those orders with a limit price more than ten cents away from the NBBO. In proposing to exclude these orders in 2000, the Commission indicated that the execution quality statistics for these types of orders may be less meaningful because execution of these types of orders may be more dependent on the extent to which the orders' limit prices were outside the consolidated best bid and offer (''BBO'') and price movement in the market than on their handling by the market center.[45]

3. Procedures for Making Reports Available to the Public

The Rule 605 NMS Plan establishes procedures for market centers to make data available to the public in a uniform, readily accessible, and usable electronic form.[46] The Plan also requires market centers to post their monthly reports on an internet website that is free of charge and readily accessible to the public.[47] Generally, reports are posted on market centers' own websites; however, they may be posted on a third-party vendor site if a market center uses a vendor to prepare its reports.[48] In addition, formatting for Rule 605 data is governed by the Plan. Among other things, the Plan sets forth the file type and structure of the reports and the order and format of fields, yielding reports that are structured and machine-readable.[49]

C. Other Relevant Rules

Rule 606 reports address order handling information and Rule 606's reporting requirements differ for held orders versus not held orders. With respect to held orders, Rule 606(a)(1) requires broker-dealers to produce quarterly public reports regarding their routing of non-directed orders [50] in NMS stocks that are submitted on a held basis. These reports must identify certain regularly-used venues to which the broker-dealer routed non-directed orders for execution and provide data on the percentage of orders routed to each venue.[51] These reports also must provide information, for each venue identified, about the payment relationship between the broker-dealer and the venue, including any payments made by a venue to a broker-dealer for the right to trade with its customer order flow (*i.e.,* payment for order flow or ''PFOF'') or rebates,[52] and a description of the material aspects of the broker-dealer's relationship with the venue and the terms of arrangements that may influence a broker-dealer's order routing

[36] *See id.* Generally, a ''not held'' order provides the broker-dealer with price and time discretion in handling the order, whereas a broker-dealer must attempt to execute a ''held'' order immediately. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58340. As a general matter, if a customer submits an order for an NMS stock to its broker-dealer, whether it be for a fractional share, whole shares, or whole shares with a fractional share component, and the customer reasonably expects its broker-dealer to attempt to execute such order immediately, then the broker-dealer generally should categorize the order as a held order.

[37] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421.

[38] *See* 17 CFR 242.605(a)(1).

[39] *See id.* ''Categorized by order type'' refers to categorization by whether an order is a market order, a marketable limit order, an inside-the-quote limit order, an at-the-quote limit order, or a near-the-quote limit order. *See* 17 CFR 242.600(b)(14).

[40] *See* 17 CFR 242.605(a)(1). The current size categories are: 100 to 499 shares; 500 to 1999 shares; 2000 to 4999 shares, and 5000 or greater shares. *See* 17 CFR 242.600(b)(11). On June 22, 2001, the Commission granted exemptive relief to any order with a size of 10,000 shares or greater, reasoning that the exclusion of very large orders would help assure greater comparability of statistics in the largest size category of 5,000 or greater shares. *See* Letter from Annette L. Nazareth, Director, Division of Market Regulation to Darla C. Stuckey, Assistant Secretary, NYSE, dated June 22, 2001 (''Large Order Exemptive Letter'').

[41] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75417. For instance, a user could analyze execution quality for a group of securities and by size and order type.

[42] *See* 17 CFR 242.605(a)(1)(i).

[43] *See* 17 CFR 242.605(a)(1)(ii).

[44] *See* 17 CFR 242.600(b)(91), (92).

[45] *See* Securities Exchange Act Release No. 43084 (July 28, 2000), 65 FR 48406, 48414 (Aug. 8, 2000) (File No. S7–16–00) (Disclosure of Order Execution and Routing Practices) (''Proposing Release'') (stating that the Commission preliminarily believed that the rule's statistical measures (*e.g.,* fill rates and speed of execution) for this type of order may be less meaningful because they would be more dependent on the extent to which the orders' limit prices were outside the consolidated BBO (and movements in market prices) than on their handling by a market center).

[46] *See* 17 CFR 242.605(a)(2) and Securities and Exchange Commission File No. 4–518 (National Market System Plan Establishing Procedures Under Rule 605 of Regulation NMS) (''Rule 605 NMS Plan'' or ''Plan''). *See also* Securities Exchange Act Release No. 44177 (Apr. 12, 2001), 66 FR 19814 (Apr. 17, 2001) (order approving the Plan).

[47] Currently, the parties to the Plan are the 16 registered national securities exchanges trading NMS stocks and 1 national securities association (the ''Participants''). Although not all market centers are Participants, the Participants are required to enforce compliance with the terms of the Plan by their members and person associated with their members. *See* 17 CFR 242.608(c). Market centers that are not Participants must make arrangements with a Participant to act as their ''Designated Participant.'' *See* Plan at IV. Each market center must notify its Designated Participant of the website where its reports may be downloaded, and each Designated Participant must maintain a comprehensive list of links for all market centers for which it functions as a Designated Participant. *See* Plan at IV, VIII(c).

[48] *See* Plan at n.3.

[49] *See id.* at 2 (''Section V . . . provides that market center files must be in standard, pipe-delimited ASCII format'').

[50] A ''non-directed order'' means any order from a customer other than a directed order. *See* 17 CFR 242.600(b)(56). A ''directed order'' means an order from a customer that the customer specifically instructed the broker or dealer to route to a particular venue for execution. *See* 17 CFR 242.600(b)(27).

[51] *See* 17 CFR 242.606(a)(1)(ii) (stating that each section in the required report shall include the identity of the ten venues to which the largest number of total non-directed orders for the section were routed for execution and of any venue to which five percent or more of non-directed orders were routed).

[52] *See* 17 CFR 242.606(a)(1)(iii).

decision.[53] In addition, Rule 606(b)(1) requires broker-dealers to provide to their customers, upon request, reports that include high-level customer-specific order routing information, such as the identity of the venues to which the customer orders were routed for execution in the prior six months and the time of the transactions, if any, that resulted from such orders.[54] For orders submitted on a held basis, the reports required by Rule 606 do not contain any execution quality information. However, a customer of a reporting broker-dealer may access the execution quality reports produced pursuant to Rule 605 by each venue identified as a routing destination in the broker-dealer's Rule 606 reports, to the extent that venue is a market center.[55]

In contrast, Rule 606 requires broker-dealers to produce reports that provide detail regarding execution quality in connection with not held orders, which are typically used by institutional investors.[56] Specifically, Rule 606(b)(3) requires broker-dealers to produce reports pertaining to order routing upon the request of a customer that places, directly or indirectly, one or more orders in NMS stocks that are submitted on a not held basis.[57] These customer-specific reports generally must include detailed information, by venue, including metrics pertaining to the broker-dealer's routing of the customer's orders and the execution of such orders.[58] In particular, the venue-by-venue order execution information must include aggregated metrics such as fill rate, percentage of shares executed at the midpoint, and percentages of total shares executed that were priced on the side of the spread more favorable to the order and on the side of the spread less favorable to the order.[59]

Current Rule 606 reflects significant changes that were made in the 2018 Rule 606 Amendments.[60] When adopting the 2018 Rule 606 Amendments, the Commission identified intensified competition for customer orders, the rise in the number of trading centers, and the introduction of new fee models for execution services as the main concerns with held orders for NMS stocks that it sought to address with the proposal.[61] The Commission stated that the more prevalent use of financial inducements to attract order flow from broker-dealers that handle retail investor orders created new, and in many cases significant, potential conflicts of interests for these broker-dealers.[62] Further, the Commission stated that enhanced public disclosures for held orders should focus on providing more detailed information regarding these financial inducements, as opposed to the different information geared towards not held orders from customers that is set forth in Rule 606(b)(3).[63] Therefore, the Commission adopted enhanced public disclosures pursuant to Rule 606(a)(1) that focused on increased transparency for the financial inducements that broker-dealers face when determining where to route held order flow.[64] The Commission stated that this enhancement would allow customers to better assess the nature and quality of broker-dealers' order handling services, including the potential for broker-dealer conflicts of interest, and would also benefit customers to the extent that broker-dealers were spurred to compete further by providing enhanced order routing services and better execution quality.[65]

At the time of the 2018 Rule 606 Amendments, the Commission considered suggestions from the Equity Market Structure Advisory Committee (''EMSAC'') and other commenters that the Commission include more or different execution quality statistics in the required disclosures.[66] But the Commission stated that the limited modifications to Rule 606(a) that it was adopting were reasonably designed to further the goal of enhancing transparency regarding broker-dealers' order routing practices and customers' ability to assess the quality of those practices, and that the suggested execution quality statistics were not necessary to achieve that goal.[67] However, the Commission noted that its determination not to adopt the additional specific disclosures was not an indication that the Commission had formed a decision on the validity or usefulness of the suggested execution quality statistics.[68]

Separately, each broker-dealer has a legal duty to seek to obtain best execution of customer orders.[69] The

[53] *See* 17 CFR 242.606(a)(1)(iv).

[54] *See* 17 CFR 242.606(b)(1).

[55] *See supra* note 23 and accompanying text.

[56] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58345 (stating that by using the not held order distinction, Rule 606(b)(3) as adopted will likely result in more Rule 606(b)(3) disclosures for order flow that is typically characteristic of institutional customers—not retail customers—and will likely cover all or nearly all of the institutional order flow). In contrast, held orders are typically used by individual investors. *See, e.g., id.* at 58372 (stating that retail investors' orders are typically submitted on a held basis and are typically smaller in size).

[57] *See* 17 CFR 240.606(b)(3).

[58] *See* 17 CFR 240.606(b)(3).

[59] *See* 17 CFR 240.606(b)(3)(ii).

[60] *See generally* 2018 Rule 606 Amendments Release.

[61] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58372.

[62] *See id.*

[63] *See id.* The Commission also considered but did not adopt an aspect of the proposal that would have required broker-dealers to make publicly available a report that would have aggregated Rule 606(b)(3) order handling information pertaining to not held orders. *See id.* at 58369–70. The Commission stated that its decision stemmed from fundamental differences between held order flow and not held order flow, because held orders are typically non-directed orders with no specific order-handling instructions for the broker-dealer. *See id.* at 58371 (stating that held order flow is handled similarly by broker-dealers—held orders are generally small orders that are internalized or sent to OTC market makers if marketable or fully executed on a single trading center if not marketable). The Commission further stated that, by contrast, not held order flow is diverse and customers may provide specific order handling instructions to their broker-dealers, limit the order handling discretion of their broker-dealers, or have specific needs that impact the broker-dealers' handling of these orders. *See id.* Therefore, the Commission concluded that the disparate behavior of customers when using not held orders limited the potential ability for customers and broker-dealers to use aggregated Rule 606(b)(3) order handling information to better understand broker-dealers' routing behavior or compare broker-dealers' order routing performance. *See id.*

[64] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58373.

[65] *See id.* In comparison, with respect to the addition of customer-specific order-handling disclosures in Rule 606(b)(3), the Commission stated that these disclosures are particularly suited to customers that submit not held NMS stock orders because the disclosures set forth detailed order handling information that is useful in evaluating how broker-dealers exercise the discretion attendant to not held orders and, in the process, carry out their best execution obligations and manage the potential for information leakage and conflicts of interest. *See id.* at 58344. As part of the 2018 Rule 606 Amendments, the Commission added Rule 606(b)(3) to require broker-dealers to make detailed, customer-specific order handling disclosures available to institutional customers, in particular, who previously were not entitled to disclosures under the rule for their order flow, or were entitled to disclosures that had become inadequate in a highly automated and more complex market. *See id.*

[66] *See id.* at 58379. *See also* EMSAC III at 2–3 (suggesting that the Commission modify the enhancements to Rule 606 to include, among other things, execution quality statistics by routing destination).

[67] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58379.

[68] *See id.*

[69] *See, e.g.,* Regulation NMS Adopting Release, 70 FR at 37537; *Newton* v. *Merrill, Lynch, Pierce, Fenner & Smith, Inc.,* 135 F.3d 266, 269–70, 274 (3d Cir.), *cert. denied,* 525 U.S. 811 (1998); *Certain Market Making Activities on Nasdaq,* Securities Exchange Act Release No. 40900, 53 SEC 1150, 1162 (1999) (settled case) (citing *Sinclair* v. *SEC,* 444 F.2d 399 (2d Cir. 1971); *Arleen Hughes,* 27 SEC 629, 636 (1948), *aff'd sub nom. Hughes* v. *SEC,* 174 F.2d 969 (D.C. Cir. 1949)). In addition, the Commission is separately proposing a rule concerning broker-dealers' duty of best execution. *See* Securities Exchange Act Release No. 96496 (Dec. 14, 2022) (File No. S7–32–22) (Regulation Best Execution). The Commission encourages commenters to review that proposal to determine whether it might affect their comments on this proposing release.

duty of best execution requires broker-dealers to execute customers' trades at the most favorable terms reasonably available under the circumstances.[70] When adopting Rule 605 and Rule 606, the Commission stated that these rules do not address and therefore do not change the existing legal standards that govern a broker-dealer's duty of best execution.[71] The Commission recognized that the information contained in the Rule 605 reports (and Rule 606 reports) will not, by itself, be sufficient to support conclusions regarding a broker-dealer's compliance with its legal responsibility to obtain the best execution of customer orders.[72] As the Commission stated, any such conclusions would require a more in-depth analysis of the broker-dealer's order routing practices than will be available from the disclosures required by the rules.[73]

D. Overview of Need for Modernization

The U.S. equity markets have evolved significantly since the Commission adopted the Rule in 2000. For instance, the equities markets have become increasingly fragmented, as both the market shares of individual national securities exchanges became less concentrated and an increased percentage of order flow moved off-exchange. In 2000, there were 9 registered national securities exchanges and one registered national securities association.[74] A large proportion of the order flow in listed equity securities was routed to a few, mostly manual, trading centers,[75] and the primary listing exchanges retained a high percentage of the order flow for exchange-listed equities.[76]

In contrast, trading in the U.S. equity markets today is highly automated and spread among different types of trading centers, allowing even more choices about where orders may be routed. The types of trading centers that currently trade NMS stocks are: (1) national securities exchanges operating SRO trading facilities;[77] (2) ATSs that trade NMS stocks (''NMS Stock ATSs'');[78] (3) exchange market makers; (4) wholesalers;[79] and (5) any other broker-dealer that executes orders internally by trading as principal or crossing orders as agent.[80] In the first quarter of 2022, NMS stocks were traded on 16 national securities exchanges, and off-exchange at 32 NMS Stock ATSs and at over 230 other FINRA members.[81] National securities exchanges executed approximately 60% of NMS share volume.[82] The majority of off-exchange volume was executed by wholesalers, who executed almost one quarter of total volume (23.9%) and about 60% of off-exchange volume.[83] Some OTC market makers, such as wholesalers, operate SDPs through which they execute institutional orders in NMS stocks against their own inventory.[84]

Broker-dealers that primarily service the accounts of individual investors (referred to in this release as ''retail brokers'') often route the marketable orders of individual investors in NMS stocks to wholesalers.[85] The primary business model of wholesalers is to trade internally as principal with individual investor orders. They do not publicly display or otherwise reveal the prices at which they are willing to trade internally as a means to attract individual investor orders from broker-dealers. Moreover, it is generally more profitable for liquidity providers such as wholesalers to execute against orders with lower adverse selection risk because of the reduced risk that prices will move against the liquidity provider.[86] Wholesalers may provide different execution quality to different broker-dealers, depending on factors including the level of adverse selection risk of their order flow.[87]

Some retail brokers may face conflicts of interest when making order routing decisions, including whether to route to a particular wholesaler.[88] For example, broker-dealers could face conflicts of interest when making routing decisions due to their own affiliation with market centers (*e.g.,* if the broker-dealer operates its own ATS), from the presence of liquidity fees and rebates on some market centers, or from payments that some retail brokers receive from wholesalers to attract the order flow of

[70] *See* Regulation NMS Adopting Release, 70 FR 37496 (Jun. 29, 2005) at 37538 (referring to the best reasonably available price and citing *Newton,* 135 F.3d at 266, 269–70, 274). *Newton* also specified certain other factors relevant to best execution—order size, trading characteristics of the security, speed of execution, clearing costs, and the cost and difficulty of executing an order in a particular market. *See Newton,* 135 F.3d at 270 n.2.

[71] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75420.

[72] *See id.*

[73] *See id.* For example, the execution quality statistics included in Rule 605 do not encompass every factor that may be relevant in determining whether a broker-dealer has obtained best execution, and the statistics in a market center's reports typically will reflect orders received from a number of different routing broker-dealers. *See id. See also infra* notes 564–565 and accompanying text for discussion of an investment adviser's fiduciary duty, including the duty to seek best execution of a client's transactions where the investment adviser has the responsibility to select broker-dealers to execute client trades.

[74] *See* Securities and Exchange Commission, Annual Report for fiscal year 2000, at 38 *available at https://www.sec.gov/pdf/annrep00/ar00full.pdf.*

[75] *See* Securities Exchange Act Release No. 78309 (July 13, 2016), 81 FR 49432, 49436 (July 27, 2016) (''Rule 606 Proposing Release''); Fragmentation Release, 65 FR 10577 (Feb. 28, 2000) at 10579–80.

[76] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75415 (stating that in September 2000, for example, NYSE accounted for 83.3% of the share volume in NYSE equities and that the American Stock Exchange, LLC (''Amex'') accounted for 69.9% of share volume in Amex equities). *See also* Concept Release on Equity Market Structure, 75 FR 3594 (Jan. 21, 2010) at 3595 (stating that in January 2005, NYSE executed approximately 79.1% of the consolidated share volume in its listed stocks, as compared to 25.1% in October 2009). In addition, NYSE-listed stocks were traded primarily on the floor of the NYSE in a manual fashion until October 2006, at which time NYSE began to offer fully automated access to its displayed quotations. *See* Concept Release on Equity Market Structure, 75 FR 3594 (Jan. 21, 2010) at 3594–95. However, stocks traded on the NASDAQ Stock Market LLC (''NASDAQ''), which in 2000 was owned and operated by a national securities association, were already trading in a highly automated fashion at many different trading centers. *See id.* at 3595; Fragmentation Release, 65 FR 10577 (Feb. 28, 2000) at 10580.

[77] *See* 17 CFR 242.600(b)(89) (defining ''SRO trading facility'' as, among other things, a facility operated by a national securities exchange that executes orders in a security).

[78] An ''NMS Stock ATS'' as used in this release is an ATS that has filed an effective Form ATS–N with the Commission.

[79] The term ''wholesaler'' is not defined in Regulation NMS, but is commonly used to refer to an OTC market maker that seeks to attract orders from broker-dealers that service the accounts of a large number of individual investors.

[80] *See* 15 U.S.C. 78c(a)(4)(A) (defining ''broker'' generally as any person engaged in the business of effecting transactions in securities for the account of others); 15 U.S.C. 78c(a)(5)(A) (defining ''dealer'' generally as any person engaged in the business of buying and selling securities for such person's own account through a broker or otherwise). The term ''broker-dealer'' is used in this release to encompass all brokers, all dealers, and firms that are both brokers and dealers. *See also* 17 CFR 242.600(b)(95) (defining ''trading center'').

[81] *See infra* note 766 and accompanying text; Table 7.

[82] *See infra* note 767 and accompanying text; Table 7.

[83] *See infra* Table 7.

[84] *See infra* note 768 and accompanying text.

[85] There are six wholesalers that internalize the majority of individual investors' marketable orders. *See infra* note 766 and accompanying text.

[86] *See infra* note 608 and accompanying text.

[87] Analysis of Consolidated Audit Trail (''CAT'') data from the first five months of 2022 found that wholesalers provide different execution quality to different retail brokers, and in particular that broker-dealers with higher adverse selection risk systematically receive higher effective spreads and lower price improvement than broker-dealers with lower adverse selection risk. *See infra* notes 609–613 and accompanying text; Table 3. For further discussion of differences in execution quality across broker-dealers, *see infra* section VII.C.1.a).

[88] *See infra* section VII.C.3.a)(2). *See also* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58372 (stating that financial inducements to attract order flow from broker-dealers that handle retail investor orders have become more prevalent and for some broker-dealers such inducements may be a significant source of revenue); *supra* note 62 and accompanying text (stating that these financial inducements have created new, and in many cases significant, potential conflicts of interest for these broker-dealers).

their individual investor customers (PFOF).[89]

The Commission is concerned that variations in execution quality across broker-dealers may be difficult to assess using current Rule 605 and Rule 606 reports. In particular, broker-dealers that route customer orders externally, rather than executing customer orders internally, are not required to prepare Rule 605 reports because they do not meet the definition of market center. Customers of a broker-dealer can use Rule 606 reports to identify market centers to which the broker-dealer routes, and then access those market centers' Rule 605 reports to review the execution quality that the market center provides to all orders that the market center received for execution. However, to the extent that the market center may provide different execution quality to orders based on different order routing arrangements with different broker-dealers, current Rule 605 and 606 do not require reports that provide investors with a way to assess these differences.

In addition, developments in trading, including the increased speed of trading, further necessitate proposing updates to the Rule. Average stock prices have continued to increase over time,[90] and odd-lots [91] and fractional shares [92] continue to trade with increasing frequency. Similarly, odd-lot quotes in higher-priced stocks continue to offer prices that are frequently better than the round lot NBBO for these stocks,[93] and this better-priced odd-lot liquidity is distributed across multiple price levels.[94] In addition, odd-lot rates have increased among lower priced stocks.[95] Because current Rule 605 size categories exclude orders smaller than 100 shares, a significant proportion of market activity is currently excluded.[96] An analysis of Rule 605 data shows that Rule 605 coverage has likely declined in the decades since the initial adoption of Rule 605.[97] Further, because order size categories are tied to the number of shares, the categories may group orders of very different notional values, which may complicate comparisons of aggregate execution quality. Finally, the speed of the market has increased exponentially since 2000,[98] rendering the Rule's current one-second timestamp conventions less meaningful.

E. EMSAC Recommendations, Petition for Rulemaking, and Other Comments

The EMSAC [99] as well as commenters responding to the Commission's Concept Release on Equity Market Structure [100] and to the 2018 Rule 606 Amendments,[101] have recommended

[89] *See infra* notes 759–762 and accompanying text.

[90] *See supra* note 16.

[91] *See* MDI Adopting Release, 85 FR 18612 (Apr. 2, 2020) at 18616 (describing analyses included in the MDI Adopting Release confirming observations made in the MDI Proposing Release that a significant proportion of quotation and trading activity occurs in odd-lots, particularly for frequently traded, high-priced stocks). Analysis using the NYSE Trade and Quote database (obtained via Wharton Research Data Services (WRDS) (''TAQ data'' or ''NYSE TAQ data'') found that odd-lots increased from around 15% of trades in January 2014 to more than 55% of trades in March 2022. An analysis of data from the SEC's MIDAS analytics tool available at *https://www.sec.gov/marketstructure/datavis.html#.YoPskqjMKUk* shows that, in Q1 2022, odd-lots made up 81.2% of on-exchange trades (40% of volume) for stocks in the highest price decile and 25% of on-exchange trades (2.72% of volume) for stocks in the lowest price decile. *See* dataset ''Summary Metrics by Decile and Quartile'' *available at https://www.sec.gov/marketstructure/downloads.html.*

[92] Analysis using CAT data for executed orders in March 2022 found that an estimated 46.63 million originating orders with a fractional share component were eventually executed on- or off-exchange. This represents approximately 2% of all executed orders and 14% of executed orders from individual accounts. Generally, accounts classified as ''individual'' in CAT are attributed to natural persons. *See also infra* note 647 and accompanying text.

[93] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18729. In addition, a recent academic working paper shows that odd-lots offer better prices than the NBBO 18% of the time for bids and 16% of the time for offers. This percentage increases monotonically in the stock price, for example, for bid prices, increasing from 5% for the group of lowest-price stocks in their sample, to 42% for the group of highest-priced stocks. *See* Robert P. Bartlett, Justin McCrary, and Maureen O'Hara, The Market Inside the Market: Odd-Lot Quotes (Feb. 1, 2022), *available at* SSRN: *https://ssrn.com/abstract=4027099* (''Bartlett, et al.''). *See also* Elliot Banks, BMLL Technologies, Inside the SIP and the Microstructure of Odd-Lot Quotes (observing an upward trend in odd-lot trading inside the NBBO from January 2019 to January 2022).

[94] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18613 n.202 (describing analysis included in the MDI Adopting Release that examined quotation data for the week of May 22–29, 2020 for stocks priced from $250.01 to $1000.00 and found that there is odd-lot interest priced better than the new round lot NBBO 28.49% of the time, and, in 48.49% of those cases, there are better priced odd-lots at multiple price levels).

[95] For example, odd-lot rates for corporate stock price deciles 1–3 (the lowest priced corporate stocks comprising 30% of all corporate stocks) have been higher on average in 2021 and June 2022 (34%, 39%) as compared to 2019 and 2020 (26%, 29%). Similarly, exchange-traded products (''ETPs'') also exhibit higher average odd-lot rates in price quartiles 1 and 2 (the lowest priced ETPs comprising 50% of all ETPs) on average in 2021 and June 2022 (26%, 29%) compared to 2019 and 2020 (20%, 23%). *See* SEC market structure analytics data, *available at https://www.sec.gov/marketstructure/midas.html.*

[96] *See supra* notes 91–92. *See also infra* notes 619–622 and accompanying text (estimating, based on analysis of Tick Size Pilot data, coverage of current Rule 605 reporting requirements).

[97] Analysis comparing one market center's volume (NYSE) to TAQ data shows that an estimated 50% of shares executed during regular market hours were included in Rule 605 reports as of February 2021, and shows that this number has been on a slightly downward trend since around mid-2012. *See infra* section VII.C.2.b) and *infra* Figure 3.

[98] Analysis of data from the SEC's MIDAS analytics tool shows that the percent of on-exchange NMLOs that are fully executed within one millisecond (as a percentage of all fully executed on-exchange NMLOs) has increased from 2.1% in Q1 2012 to 10.3% in Q1 2022 for small cap stocks, and from 5.9% in Q1 2012 to 15.7% in Q1 2022 for large cap stocks. Further, in Q1 2022 more than half (51.6%) of NMLOs executed in less than one second in large market cap stocks. *See* dataset ''Conditional Cancel and Trade Distribution,'' *available at https://www.sec.gov/marketstructure/downloads.html. See also infra* note 692 and accompanying text.

[99] *See* Transcript from EMSAC Meeting (Aug. 2, 2016), *available at https://www.sec.gov/spotlight/emsac/emsac-080216-transcript.txt* (''EMSAC I''); Transcript from EMSAC Meeting (Nov. 29, 2016), *available at https://www.sec.gov/spotlight/equity-market-structure/emsac-transcript-112916.txt* (''EMSAC II''); EMSAC Recommendations Regarding Modifying Rule 605 and Rule 606 (''EMSAC III''), Nov. 29, 2016, *available at https://www.sec.gov/spotlight/emsac/emsac-recommendations-rules-605-606.pdf.*

[100] *See, e.g.,* Letter from Christopher Nagy, CEO, and Dave Lauer, President, KOR Group LLC (Apr. 4, 2014) (''KOR Group I''); Letter from Citigroup Global Markets Inc. and its affiliates re Concept Release on Equity Market Structure (Release No. 34–61358; File No. S7–02–10) (Aug. 7, 2014) (''Citigroup Letter''); Letter from Consumer Federation of America re File Number S7–02–10, Comments on Concept Release on Equity Market Structure (Sept. 9, 2014) (''Consumer Federation I''); Letter from BlackRock, Inc. re Equity Market Structure Recommendations; Concept Release on Equity Market Structure, File No. S7–02–10; Regulation Systems Compliance and Integrity, File No. S7–01–13; and Equity Market Structure Review (Sept. 12, 2014) (''BlackRock Letter''); Letter from Financial Information Forum re Rule 605/606 Enhancements from a Retail Perspective (Oct. 22, 2014) (''FIF I''); Letter from Securities Industry and Financial Markets Association re Recommendations for Equity Market Structure Reforms (Oct. 24, 2014) (''SIFMA Letter''); Healthy Markets Proposal re SEC Rule 605/606 Reform (referenced in Aug. 2, 2016 statement of Christopher Nagy before the EMSAC) (''Healthy Markets II'') at 2; Letter from Healthy Markets re Notice of Meeting of Equity Market Structure Advisory Committee Meeting (File No. 265–29); List of Rules to be Reviewed Pursuant to the Regulatory Flexibility Act (File No. S7–21–16); Concept Release on Equity Market Structure (File No. S7–02–10) (Apr. 3, 2017) (''Healthy Markets III''); Letter from Healthy Markets re Potential Reforms Regarding the Provision of Market Data, Concept Release on Equity Market Structure (Rel. No. 34–61358; File No. S7–02–10), and Market Data and Market Access Roundtable (Rel. No. 4–729) (Jan. 3, 2020) (''Healthy Markets IV''). Comments on the Commission's 2010 Concept Release on Equity Market Structure are available at *https://www.sec.gov/comments/s7-02-10/s70210.shtml.* As with various other comments referenced herein, including, without limitation, comments received in connection with the Concept Release, the comments were not provided with reference to the proposals discussed in this release.

[101] *See, e.g.,* Letter from James J. Angel, Ph.D., CFA, Georgetown University re Disclosure of Order Handling Information, File S7–14–16 (Aug. 26, 2016) (''Angel Letter''); Letter from Consumer Federation of America re File Number S7–14–16, Disclosure of Order Handling Information (Sept. 26, 2016) (''Consumer Federation II''); Letter from Fidelity Investments re Disclosure of Order Handling Information; File No. S7–14–16 (Sept. 26, 2016) (''Fidelity Letter''); Letter from Financial Information Forum re Release No. 34–78309; File

that the Commission amend Rule 605 to modernize the Rule and increase the usefulness of available execution quality disclosures. In addition, one broker-dealer petitioned the Commission to make ''modest rule amendments'' to Rule 605 and further stated that ''[i]mproving these metrics is essential for a market participant to quantitatively and qualitatively assess whether any particular broker-dealer obtained the most favorable terms under the circumstances for customer orders.'' [102]

The EMSAC and commenters generally support expanding the Rule's scope beyond market centers.[103] In particular, in November 2016, the EMSAC recommended that the Commission ''[e]xpand the scope of Rule 605 by requiring every broker-dealer to report with an exemption for broker[-]dealers with de minimis order flow, aligning the scope of Rule 605 reporting with Rule 606.'' [104] The EMSAC's recommendation acknowledged that there would be compliance and implementation costs associated with this expansion, but stated that the use of third-party vendors may mitigate some of these concerns.[105] Further, the EMSAC's recommendation stated that having all broker-dealers provide Rule 605 data would create an opportunity for market participants, academics, and the press to evaluate these statistics in a consistent manner.[106]

When the EMSAC met to consider this recommendation, panelists provided some explanation of the gaps in current execution quality disclosures. One panelist stated that the current reporting regime ''miss[es] important information about the overall execution quality of a covered order'' because Rule 605 reports only pertain to order routing handled by market centers.[107] This panelist explained that orders are handled by smart order routers that may not be located within a market center, and the Rule 605 data does not capture price slippage or delays that may occur as these orders are received by multiple non-executing market centers or broker-dealers.[108] Another panelist described the difficulties that he encountered when trying to compare the execution quality of brokers using data available under the existing rules.[109] According to the panelist, he ''had to make very rough inferences about the brokers' executions because of the gaps in the disclosure requirements.'' [110] Moreover, this panelist stated that one fundamental problem with making these inferences was that a market maker's average execution quality across all of its orders received from brokers may be better or worse than its execution quality with respect to a particular broker's order flow.[111]

One EMSAC committee member acknowledged that retail brokerage firms did not favor the recommendation to expand Rule 605 reporting to broker-dealers, and stated that these firms would argue that aggregate statistics are more important for retail investors, who they claim are not going to look at the Rule 605 reports.[112] This committee member stated that the counter-argument to this position is that if everyone is preparing Rule 605 reports, it would be possible to do various types of aggregation using that data.[113] When the EMSAC met later to approve the recommendation, one committee member stated that the goal is to make data publicly available so that ''experts can help people make better decisions'' and that different groups would turn the data into usable reports, so it is not necessary to scale back the disclosures for the consumer.[114]

When the Commission solicited comment on the 2018 Rule 606 Amendments, several commenters recommended that the Commission expand the required reporting of execution quality statistics to better cover retail investors.[115] One commenter stated that the type of standardized execution statistics that several firms voluntarily publish on a quarterly basis measure the quality of trade executions on retail investor orders in exchange-listed stocks and help investors evaluate their particular retail brokerage firm.[116] Another commenter stated that there is a ''fundamental flaw'' in the logic of Rule 605 and Rule 606 because ''[t]he structure of the rules implicitly assumes

No. S7–14–16; Disclosure of Order Handling Information (Sept. 26, 2016) (''FIF II''); Letter from Financial Services Roundtable re Disclosure of Order Handling Information Proposal [File No. S7–14–16] (Sept. 26, 2016) (''Financial Services Roundtable Letter''); Letter from Healthy Markets Association re Disclosure of Order Handling Information (S7–14–16) (Sept. 26, 2016) (''Healthy Markets I''); Letter from IHS Markit re Disclosure of Order Handling Information; Proposed Rule, Release No. 34–78309; File No. S7–14–16 (Sept. 26, 2016) (''IHS Markit Letter''). Comments receiving in connection with the 2018 Rule 606 Amendments are available at *https://www.sec.gov/comments/s7-14-16/s71416.htm.*

[102] Letter from Virtu Financial re Petition for Rulemaking to Amend SEC Rule 605 (Sept. 20, 2021) (''Virtu Petition'') at 2, *available at https://www.sec.gov/rules/petitions/2021/petn4-775.pdf.*

[103] *See* EMSAC III at 2; IHS Markit Letter at 2; Healthy Markets II at 2.

[104] EMSAC III at 2 (adopting recommendations of the Customer Issues Subcommittee).

[105] *See id.*

[106] *See id.*

[107] *See* EMSAC I at 0103:23–0104:7 (Frank Hatheway, NASDAQ).

[108] *See id.* at 0104:7–12 (Frank Hatheway, NASDAQ).

[109] *See id.* at 0094:6–0100:12 (Bill Alpert, Barron's).

[110] *Id.* at 0096:12–15 (Bill Alpert, Barron's). *See also id.* at 0097:3–8 (Bill Alpert, Barron's) (stating that ''the only effective, objective way to use the available disclosures was to score each broker with a weighted sum of their order flow fractions from the routing reports and then weight those with the effective over quoted measures of the market makers that they were sending their orders to''); 0096:25–0097:3 (stating that some brokers voluntarily disclose execution quality information, but they use different information and so the information is not comparable).

[111] *See* EMSAC I at 0097:14–22 (Bill Alpert, Barron's). *See also id.* at 0096:18–22 (Bill Alpert, Barron's) (stating that ''almost every broker'' claimed that the execution quality that it received at a particular market maker was above average). This panelist also argued, based on the introduction of voluntary disclosures regarding price improvement for odd-lot orders by a few brokers and market makers, that disclosure improves behavior. *See id.* at 0098:6–0099:9 (Bill Alpert, Barron's) (stating the price improvement on odd-lot orders improved within a year after voluntary disclosures started). *See also id.* at 0132:6–11 (Brad Katsuyama, IEX) (stating that improving disclosures leads to improved performance).

[112] *See id.* at 0136:24–0137:7 (Manisha Kimmel, Thomson Reuters). *But see id.* at 0102:22–0103:2) (Frank Hatheway, NASDAQ) (''While individual retail investors generally don't review 605 statistics themselves, . . . the existence of the reports appears to provide precisely the form of discipline that the Commission envisioned when it adopted Rule 605 and 606.'').

[113] *See* EMSAC I at 0137:7–10 (Manisha Kimmel, Thomson Reuters). *See also* Statement of Christopher Nagy, Healthy Markets Association, at 6 (suggesting that the Commission mandate reporting of some execution quality statistics for retail orders); Healthy Markets I at 5–6 (recommending that the Commission modify Rule 606 to include select execution quality statistics from Rule 605 for each identified routing destination).

[114] EMSAC II at 0065:1–16 (Brad Katsuyama, IEX). *But see id.* at 0064:18–24 (Jamil Nazarali, Citadel) (stating that his firm's retail broker clients expressed concerns with the recommendation that Rule 606 include the execution quality of the market makers that they route to, because there is a lot of important criteria that goes into routing and the reports could be misleading).

[115] *See* Angel Letter at 3 (recommending that brokers should be required to provide execution quality statistics by providing information on individual trade confirmations and displaying summary statistics on their websites); Fidelity Letter at 7–8 (recommending that the Commission require brokers to make publicly available certain execution quality statistics); Healthy Markets I at 7, 11 (recommending that execution quality metrics should be provided to retail customers); IHS Markit Letter at 2 (recommending that all brokers that receive client orders and subsequently route orders on behalf of the client should provide information on the execution quality received at each venue). *See also* Consumer Federation II at 10; Financial Services Roundtable Letter at 4–5.

[116] *See* Fidelity Letter at 7–8. For additional discussion about this voluntary effort to provide aggregated execution quality statistics, *see infra* notes 450–451 and accompanying text. *See also* Consumer Federation II at 10 (stating that voluntary disclosures by several market participants show that such disclosures are possible, and undercut arguments that doing so is too costly or burdensome).

that execution quality is solely a function of the market center and that the brokerage firm has no impact on execution quality.'' [117] According to this commenter, execution quality is a product of both the broker's skill and the quality of the market center's execution, and therefore requiring brokers to show where they route orders does not provide retail investors with useful information about the actual execution quality that their orders receive.[118] Another commenter stated that even though most retail investors may not use the disclosures directly, disclosures provide indirect benefits by promoting competition and by facilitating use by third-party analysts and academic researchers that provide an in-depth review of the disclosures.[119]

One market participant, in a letter recommending that the Commission require broker-dealers to publish monthly cost of execution statistics, stated that Rule 605 and Rule 606 statistics published by market centers and broker-dealers do not provide a means for customers to judge how their brokers have performed with respect to keeping commissions low without adversely affecting execution quality.[120] This commenter further remarked that matching a broker's routing statistics up with a receiving market center's execution quality statistics is ''essentially impossible.'' [121]

Commenters have also suggested various ways to expand or modify the definition of covered order, including broadening its scope to capture additional order types.[122] In particular, the petitioner for rulemaking recommended including short sales, stop orders, and pre-market orders in Rule 605 reports.[123] The petitioner stated that these order types are ''critical to a complete assessment of execution quality,'' and stated that many retail brokers include these orders when measuring the execution quality provided by market centers.[124] A commenter to the 2018 Rule 606 Amendments also recommended including orders submitted prior to the market open in Rule 605 reports and stated that the marketable or non-marketable characteristics of such orders cannot be determined under the current framework.[125]

The EMSAC and commenters have also suggested bringing smaller and larger order sizes within scope.[126] The petitioner stated that bucketing orders solely by numbers of shares is skewing comparisons.[127] Another commenter, responding to the Commission's Concept Release on Equity Market Structure, recommended the following order size buckets: one share to 99 shares; 100 shares up to 9,999 shares, divided into 100 share increments; 10,000 shares to 24,999 shares; greater than 25,000 shares.[128] One commenter that offered recommendations to modify Rule 605 suggested including a $500,000 notional cap on all share size buckets.[129] Another market participant expressed support for that cap or a different one.[130] The market participant suggested that a cap of $200,000, consistent with the definition of ''block size'' in 17 CFR 242.600(b)(12)(ii), would make sense, but noted that benchmark has not changed with inflation.[131] The market participant also stated that the use of notional buckets in the ''categorized by order size'' definition would account for fractional share and odd-lot orders.[132]

Commenters have also raised concerns about the current provisions in the Rule for timestamps, especially given the speed of today's marketplace.[133] Others have also suggested modifications to improve the accessibility and standardizations of reports, including centralizing report creation and requiring summary statistics.[134] In several contexts in which the Commission has received general feedback on equity market structure, commenters have suggested that the Commission require a simplified execution quality report, particularly for retail investors.[135] One commenter on the Concept Release on Equity Market Structure stated that if the Commission's goal was for execution quality statistics to make the markets more transparent for retail investors, the commenter did not believe that was occurring, and the average retail investor might benefit more from a simplified version of the report.[136] One EMSAC committee member stated that some retail firms have argued that aggregate statistics are more important for the retail investor, and that retail investors are not going to look at Rule 605 reports.[137] This EMSAC committee member further stated that an issue with aggregation is what to include in the aggregate statistics, and depending on a firm's business model, the firm may want to

[117] Angel Letter at 3.

[118] *See id.* However, this commenter also stated that the Rule 605 data on execution quality is too raw for most investors to interpret. *See id.* at 2. *See also* Consumer Federation II at 10 (stating that the only way to assess whether customers are being best served by their broker-dealer's routing decisions is by requiring execution quality statistics); Financial Services Roundtable Letter at 4–5 (stating that currently Rule 605 reports require investors to draw an inference that they will achieve the same performance as the average order sent to that venue, and additional data would help an investor compare the execution quality that various broker-dealers obtain at a particular execution venue).

[119] *See* Consumer Federation II at 10. *See also* IHS Markit Letter at 29–30 (stating that large retail routing brokers use private, internal versions of Rule 605 reports to calculate execution quality metrics for different market centers, leading to significant improvement in execution quality statistics for covered orders, and that voluntary reporting of execution quality metrics has also improved execution quality).

[120] *See* Letter from Thomas Peterffy, Chairman, Interactive Brokers Group (Aug. 1, 2014), at 3 (''Interactive Brokers Letter''), *available at https://www.interactivebrokers.com/download/execution_stats_comment_letter.pdf* (''Payment for order flow has often been justified by its advocates based on the claim that the receipt of such payments allows brokers to keep commissions low and does not affect execution quality (or if it does, such costs are passed back to customers in the form of lower commissions). . . . [T]he current Rule 605 and 606 statistics published by market centers and brokers . . . do not provide a basis for regulators to judge these claims, or for customers to judge their broker's performance.'').

[121] Interactive Brokers Letter at 3.

[122] *See* Letter from Financial Information Forum re Request for Comment—FIF Rule 605 Modernization Recommendations (Jan. 30, 2019) (''FIF III''), *available at https://www.sec.gov/comments/s7-02-10/s70210-5002077-182848.pdf;* EMSAC III; IHS Markit Letter; Healthy Markets II; FIF Letter I; KOR Group I.

[123] *See* Virtu Petition at 5.

[124] *Id.*

[125] *See* FIF II at 11–12.

[126] *See* EMSAC III at 2; FIF III at 4; Healthy Markets II at 3; IHS Markit Letter at 9–10, 34.

[127] *See* Virtu Petition at 5.

[128] *See* Healthy Markets II at 4.

[129] *See* FIF III at 4.

[130] *See* ''Would 605 Work Better in Dollars?'', Phil Mackintosh, Chief Economist and Senior Vice President, Nasdaq (Sept. 16, 2021), *available at: https://www.nasdaq.com/articles/would-605-work-better-in-dollars-2021-09-16.*

[131] *See id.* The market participant stated that ''a lower [than $500,000] notional cap makes sense too, given the small sizes of retail orders, especially when we consider the limits of the typical depth of book to fill covered orders.'' *Id.*

[132] *See id.*

[133] *See* KOR Group I at 2, FIF I at 2.

[134] *See* EMSAC I at 0099:25–0100:3, 0106:14–25; EMSAC III at 2; Healthy Markets II at 3; BlackRock Letter at 3; Citi Letter at 8; Consumer Federation II at 6.

[135] *See, e.g.,* Citigroup Letter at 8 (suggesting in connection with the Concept Release on Equity Market Structure that a simplified execution quality report geared towards retail investors should contain a simple chart or graph showing how often a customer's trades are executed at the NBBO or better, how fast the trade is done, and whether the customer received enhanced liquidity); SIFMA Letter at 12 (stating in providing recommendations for equity market structure reforms that regulators should direct broker-dealers to provide public reports of order routing and execution quality metrics that are geared towards retail investors, and these reports should include relevant information in a uniform format that is easy to understand).

[136] *See* Citigroup Letter at 8.

[137] *See* EMSAC I at 0137:4–7 (Manisha Kimmel, Thomson Reuters). *See also id.* at 0137:7–10 (''The counter argument to that is, if everybody is doing the 605 [reports], then you could have all sorts of aggregation based on that . . .'').

put in different things.[138] Separately, the EMSAC, as well as a commenter to the 2018 Rule 606 Amendments, recommended that the Commission incorporate Rule 605 and 606 data into the Commission's data visualization tool.[139]

III. Proposed Modifications to Reporting Entities

A. Larger Broker-Dealers

Rule 605 of Regulation NMS requires market centers, such as national securities exchanges, OTC market makers, and ATSs, to produce publicly available, monthly execution quality reports. However, broker-dealers are not included within the scope of Rule 605's reporting requirements unless they are market centers. Although Rule 606 requires broker-dealers to identify the venues, including market centers, to which they route customer orders for execution, customers of those broker-dealers do not have access to comprehensive information about execution quality. For example, to the extent that a market center's execution quality differs for orders received from one broker-dealer versus another broker-dealer, that difference would not be apparent from currently available execution quality statistics.

The Commission is proposing to expand the scope of entities that must prepare Rule 605 reports to include larger broker-dealers, which have a customer-facing line of business. As proposed, Rule 605 would include broker-dealers as reporting entities, in addition to market centers, but exclude from that expanded requirement broker-dealers that do not introduce or carry at least 100,000 customer[140] accounts. This expansion of the scope of Rule 605 would improve the usefulness of execution quality statistics, promote fair competition, and enhance transparency by providing investors with information that they could use to compare the execution quality provided by customer-facing broker-dealers. Further, limiting these reporting obligations to broker-dealers that have a larger number of customers would focus the associated implementation costs on those broker-dealers for which the availability of more specific execution quality statistics would provide a greater benefit.

Rule 605 and Rule 606 operate together to allow investors to evaluate what happens to their orders after investors submit their orders to a broker-dealer for execution.[141] In the current regulatory environment, customers that submit held orders (in many cases, individual investors) have a limited ability to assess the execution quality that their broker-dealers are providing. A customer of a broker-dealer can use a broker-dealer's Rule 606 reports to identify certain regularly-used venues to which the broker-dealer routes orders for execution. However, with respect to held orders, these Rule 606 reports are not required to include any detailed execution quality information.[142] Moreover, Rule 605 reports prepared by market centers commingle orders from all broker-dealers that send covered order flow to the reporting market center. Yet a market center may provide different execution quality to customers of different broker-dealers, and in some cases this difference may be substantial.[143] Therefore, a customer of that broker-dealer must make an inference about the execution quality achieved by that particular broker-dealer at a market center based on a Rule 605 report that covers all orders received by the market center, even though that inference may not be accurate.[144]

Due to this gap in the reporting requirements, variations in execution quality provided by a market center to a particular broker-dealer submitting the order are not observable by market participants and other interested parties using publicly available execution quality reports.[145] When requiring each market center to report on all orders that it received for execution, the Commission intended to assign the disclosure obligation to the entity that would control whether and when the order would be executed.[146] The Commission required market centers to include in their Rule 605 reports those orders that they routed to another venue for execution, thereby recognizing that market centers' decisions about whether and how to route orders can affect execution quality.[147] Likewise, broker-dealers that route customer orders make decisions that affect the execution quality that their customers' orders receive.

In addition, while the Commission adopted Rule 605 in 2000 as a ''minimum step necessary to address fragmentation,''[148] the equities markets have grown even more fragmented since that time.[149] Broker-dealers have many choices about where to route customer orders for execution. But broker-dealers may face conflicts of interest when discussing arrangements regarding the outsourcing of customer order flow, including those that involve PFOF, and making routing decisions.[150] With respect to orders submitted on a held basis, broker-dealers must include information about their payment relationships with execution venues in quarterly reports prepared pursuant to Rule 606(a)(1).[151] Without information

[138] *See id.* at 0137:11–16 (Manisha Kimmel, Thomson Reuters).

[139] *See* EMSAC III at 2; FIF II at 13. *See also* EMSAC I at 0139:20–0140:11 (Gary Stone) (stating that individual investors need the Commission to provide the data, because they cannot rely on vendors that will charge for that service); EMSAC I at 0105:20–0106:7 (Frank Hatheway, NASDAQ) (stating that before replacing these existing offerings by data vendors of data visualization tools for Rule 605 and 606 data, the Commission may want to consider alternatives for making the data widely available and accessible); EMSAC I at 0140:12–15 (Bill Alpert, Barron's) (stating that it would be salutary to have competition between vendors, the Commission, and the press to develop easier to use tools and better presentations).

[140] ''Customer'' means any person that is not a broker or dealer. *See* 17 CFR 242.600(b)(23).

[141] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75414.

[142] *See supra* notes 50–55 and accompanying text.

[143] *See supra* notes 108–110 and accompanying text (discussing an EMSAC panelist's observations after trying to infer execution quality based on available data that one ''fundamental problem'' with making these inferences was that a market maker's execution quality may vary according to each broker's order flow). *See also supra* note 87 and accompanying text.

[144] *See supra* notes 107–111, 115–118, and 120–121 and accompanying text.

[145] The Commission preliminarily believes that many institutional customers regularly conduct, directly or through a third-party vendor, transaction cost analysis of their orders to assess execution quality against various benchmarks, but this information is not publicly available. The Commission believes that some institutional investors may currently use aggregated statistics or summaries of Rule 605 reports prepared by third parties, who make these reports available for a fee. *See infra* section VII.C.1.(c)(2).

[146] *See supra* note 33 and accompanying text (citing Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421).

[147] When adopting Rule 605, the Commission stated that from the perspective of the customer who submitted the order, the fact that a market center chooses to route the order away ''does not reduce the customer's interest in a fast execution that reflects the consolidated BBO'' that is ''as close to the time of order submission as possible,'' and that, consequently, in evaluating the quality of order routing and execution, it is important for customers to know how the market center handles ''all orders that it receives, not just those it chooses to execute.'' Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75423.

[148] *See supra* note 9 and accompanying text.

[149] *See supra* notes 74–84 and accompanying text.

[150] *See supra* notes 88–89 and accompanying text.

[151] *See supra* notes 50–52 and accompanying text. As discussed above (*supra* section II.D), Rule 606 requires broker-dealers to identify and report data according to execution venue, rather than by market center. Not all execution venues reflected on Rule 606 reports will necessarily fall within Regulation NMS's definition of ''market center.'' *See, e.g.,* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58365 (stating that the Commission's reference to ''venues'' for purposes of Rule 606(b)(3) is meant to refer to external liquidity providers to which the broker-dealer may send actionable indications of interest (''IOIs''), and that this category of market participants likely would

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about the execution quality that broker-dealers in the business of routing customer orders obtain for those orders, market participants and other interested parties lack key information that would facilitate their ability to evaluate how these payment relationships may affect execution quality. Recognizing these and other concerns, the EMSAC and other commenters in multiple contexts have suggested that the Commission expand the scope of Rule 605 to require reporting by broker-dealers.[152]

Consequently, the Commission is now proposing to require larger broker-dealers to prepare and publish execution quality reports pursuant to Rule 605, through the proposed revisions to Rule 605 and the addition of proposed Rule 605(a)(7). This expansion of the scope of reporting entities would increase transparency into the differences in execution quality achieved by broker-dealers when they route customer orders to execution venues, and thereby would make the execution quality statistics more useful to market participants and other interested parties.[153] This change would increase competition among broker-dealers that accept customer orders for execution by providing information that market participants can use to evaluate and compare broker-dealers' execution quality. This could lead to faster executions, better price improvement, and a shift in order flow to those broker-dealers offering the best execution quality for their customers. This would further the national market system objectives set forth in section 11A(a)(1) of the Exchange Act, including the efficient execution of securities transactions, fair competition among market participants, the public availability of information on securities transactions, and the best execution of investor orders.[154]

Specifically, the Commission is proposing to amend Rule 605 to apply the reporting requirements contained therein to brokers and dealers, in addition to market centers. Where current Rule 605 refers to ''market centers,'' the Commission is proposing to insert references to ''brokers'' and ''dealers.'' [155] The proposed expansion of Rule 605's reporting requirements to cover broker-dealers would also affect Rule 600 of Regulation NMS. Specifically, the definition of ''covered order'' in Rule 600(b)(22) refers to ''any market order or any limit order (including immediate-or-cancel orders) received by a market center.'' [156] The Commission is proposing to amend this provision to refer to orders ''received by a market center, broker, or dealer.'' [157] Further, as noted above, the Plan establishes procedures for market centers to follow in making available to the public the monthly reports required by the Rule.[158] Because of the proposed amendments to the Rule, the existing Plan would no longer comply with proposed Rule 605(a)(3) and thus would need to be updated in order to incorporate references to broker-dealers subject to the Rule.[159] As is currently the case for market centers that are not Participants, the Participants would be required to enforce compliance with the terms of the Plan by their members and person associated with their members.[160]

The Commission is mindful that Rule 605's execution quality reports contain a large volume of statistical data, and as a result it may be difficult for individual investors to review and digest the reports. The Commission considered the volume of execution quality statistics that would be produced when adopting Rule 605, and stated that the large volume of statistics reflects a deliberate decision by the Commission to avoid the dangers of overly general statistics that could hide significant differences in execution quality.[161] By requiring brokers-dealers to report stock-by-stock order execution information in a uniform manner, the proposal would make it possible for market participants and other interested parties to make their own determinations about how to group stocks or orders when comparing execution quality across broker-dealers.[162] Further, to the extent that certain market participants may not have the means to directly analyze the detailed statistics,[163] the Commission expects that independent analysts, consultants, broker-dealers, the financial press, and market centers will respond to the needs of investors by analyzing the disclosures and producing more digestible information using the data, as the Commission anticipated when approving the predecessor to Rule 605 and has observed since that time.[164] As discussed further below, the Commission also is proposing to require all market centers and broker-dealers that would be subject to Rule 605's reporting requirements to produce summary reports with aggregated execution quality information.[165] Requiring broker-dealers to produce more detailed execution quality data would help ameliorate potential concerns about overly general statistics, or about the specific categorization of orders and selection of metrics in the summary reports, by allowing market participants and other interested parties to conduct their own analysis based on

include market centers as defined in Rule 600(b)(38), but may not be limited to such market centers).

[152] *See generally supra* section II.E.

[153] Among the commenters that raised concerns about the lack of available information regarding the execution broker-dealers provide to their customers' orders, one commenter stated that there is a ''fundamental flaw'' in the logic of Rule 605 and Rule 606 because these rules assume that execution quality is solely the function of the market center, but instead execution quality is a product of a combination of the broker's skill and the quality of the market center's execution. *See supra* notes 117–118 and accompanying text. The proposal would address this concern by requiring larger broker-dealers to produce execution quality reports, rather than leaving market participants and other interested parties to rely solely on the execution quality reports produced by the market centers to which a particular broker-dealer routes orders.

[154] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75414 n.1, 75417 (citing 15 U.S.C. 78k–1).

[155] *See* proposed Rules 605 (introductory paragraph), 605(a) (caption), 605(a)(1), 605(a)(1)(i)(D), 605(a)(3), 605(a)(4), 605(a)(5), and 605(a)(6).

[156] 17 CFR 242.600(b)(22). The Commission is proposing to renumber the definition of ''covered order'' as proposed Rule 600(b)(30).

[157] *See* proposed Rule 600(b)(30).

[158] *See supra* section II.B.3.

[159] The Plan details procedures for market centers to follow and, among other things, specifies the order and format of fields in a manner that aligns with current Rule 605(a)(1). *See* Plan generally and section VI(a) of the Plan. Under current Rule 605(a)(2), every national securities exchange trading NMS stocks and each national securities association is required to act jointly in establishing procedures for market centers to follow in making the reports required by Rule 605(a)(1) available to the public in a uniform, readily accessible, and usable electronic form. *See* 17 CFR 242.605(a)(2). The proposal would add brokers and dealers to the scope of entities to be covered by the Plan's procedures and renumber Rule 605(a)(2) as Rule 605(a)(3). *See* proposed Rule 605(a)(3). The Plan would also need to be updated to accommodate any new data elements in the order and format of fields.

[160] *See* 17 CFR 242.608(c). *See also supra* note 47 (describing Participants and Designated Participants under the Plan).

[161] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419. *See also id.* (stating that after this basic information is disclosed by all market centers in a uniform manner, market participants and other interested parties will be able to determine the most appropriate classes of stocks and orders to use in comparing execution quality across market centers).

[162] *See, e.g., supra* note 113 and accompanying text.

[163] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419, text accompanying n.27 (stating that most individual investors likely would not obtain and digest the reports themselves). *See also supra* note 112 and accompanying text (EMSAC committee member stating that retail investors will not look at the Rule 605 reports); note 118 (commenter stating that Rule 605 data is too raw for most investors to interpret); note 119 and accompanying text (commenter stating that most retail investors may not use the disclosures directly).

[164] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419. *See also supra* notes 106, 114, 116 and accompanying text; *infra* notes 544–546 and accompanying text.

[165] *See infra* section V.

alternative categorizations of the underlying data.

Proposed Rule 605(a)(7) states that a broker or dealer that is not a market center shall not be subject to the requirements of Rule 605 unless that broker or dealer introduces or carries 100,000 or more customer accounts through which transactions are effected for the purchase or sale of NMS stocks (the ''customer account threshold'').[166] The Commission is mindful of the additional costs that broad expansion of the rule to broker-dealers would entail. The relative benefit of having a broker-dealer prepare Rule 605 reports increases when the broker-dealer has more customers. The Commission is proposing a minimum reporting threshold of 100,000 customers to balance the benefits of having broker-dealers produce execution quality statistics with the costs of implementation and continued reporting.[167]

Analysis indicates that approximately 85 broker-dealers (or approximately 6.7% of customer-carrying broker-dealers) introduce or carry more than 100,000 customer accounts and these broker-dealers together handle over 98% of customer accounts.[168] Utilizing a 100,000 customer account threshold would allow the Rule 605 reporting requirements to capture those broker-dealers that introduce or carry the vast majority of customer accounts, while subjecting only a relatively small percentage of broker-dealers that accept customer orders for execution to the reporting obligation and excluding those broker-dealers that introduce or carry a smaller number of customer accounts. Although utilizing a lower customer account threshold, such as 10,000 customer accounts, would result in capturing substantially more transactions, the lower customer account threshold would result in capturing only marginally more customer accounts. This implies that the additional customer coverage would result from a small number of accounts that trade in large volumes. Therefore, the additional coverage may not be as beneficial because many of the additional customer accounts that would be included with a lower threshold likely belong to institutional traders that have access to alternative execution quality information and also are likely to use not held orders, which are not included in Rule 605 reports.[169]

The Commission considered using the volume of broker-dealers' customer transactions, rather than the number of their customer accounts, for purposes of establishing a reporting threshold. Although establishing a reporting threshold using the number of customer transactions would likely capture a larger number of customer orders than the proposed customer account threshold, this approach would likely exclude broker-dealers that have a larger number of relatively inactive customer accounts and include broker-dealers that have a small number of customer accounts associated with large amounts of trading volume. In each respect, the reporting threshold would be less likely to capture individual investor orders and more likely to capture institutional investor orders, and therefore the threshold would be less likely to target the types of orders that may be most useful for consumers of Rule 605 reports. In addition, utilizing a threshold based on the number of customer transactions may result in a less stable set of broker-dealers that are subject to Rule 605's reporting requirements, because transaction volume is more likely than customer account numbers to vary significantly from month to month based on market conditions. Further, the number of their customer accounts is likely less costly for broker-dealers to calculate and track as compared to the volume of transactions associated with their customer accounts.[170]

The Commission also considered EMSAC's recommendation to expand the scope of Rule 605 to cover all broker-dealers, which contemplated excluding only broker-dealers with de minimis order flow.[171] The Commission is preliminarily concerned that subjecting a significantly larger number of broker-dealers to Rule 605's reporting requirements would substantially increase the costs of the proposal and that the increase in cost that would accompany the use of a de minimis threshold would not be justified by the corresponding benefit.[172] This concern about requiring smaller broker-dealers to prepare Rule 605 reports is present with any *de minimis* threshold, whether based on order flow as the EMSAC suggested or on some other measure such as number of customer accounts.

The proposed customer account threshold would require brokers-dealers to include in their calculations the public customer accounts that they introduce, as well as the customer accounts that they carry.[173] Rule 605 reports that reflect orders received from customer accounts that a broker-dealer introduces or carries would provide useful information to market participants because both introducing and carrying broker-dealers make decisions about where to route those orders and it would be helpful for customers to be able to evaluate the execution quality received as a result of those decisions.[174] An introducing broker-dealer may choose to utilize an omnibus clearing arrangement and not disclose certain information about its underlying customer accounts to the clearing firm.[175] In such circumstances,

[166] In addition, as discussed further below, proposed Rule 605(a)(7) states that any broker or dealer that meets or exceeds this customer account threshold and is also a market center shall produce separate reports pertaining to each function.

[167] *See infra* section VII.D.2 for a discussion of the costs of the proposed amendments to Rule 605. As discussed further below, broker-dealers that were previously not required to publish Rule 605 reports would incur initial costs to develop the policies and procedures to post Rule 605 reports for the first time, and all broker-dealers would face ongoing costs to continue to prepare them each month. Other potential costs include a potential for less transparency or lower execution quality, and the costs to update best execution methodology. *See also infra* section VII.E.1.(a) for a discussion about the potential costs of imposing Rule 605's reporting requirements on broker-dealers with a smaller number of customer accounts.

[168] *See infra* Table 13 for cost-benefit analysis of different customer account thresholds defining ''larger broker-dealer'' and *infra* note 1008 and accompanying text for methodology. For example, approximately 45 broker-dealers introduce or carry more than 500,000 customer accounts and these broker-dealers together handle over 96% of customer accounts. Further, approximately 235 broker-dealers introduce or carry more than 10,000 customer accounts and these broker-dealers together handle over 99% of customer accounts. *See infra* Table 13.

[169] *See infra* note 1011 and accompanying text; Table 13. *See also infra* section VII.E.1.(a) for further discussion of alternative customer account thresholds.

[170] *See infra* section VII.E.1.(c) for further discussion about using a threshold based on the number of customer transactions.

[171] *See supra* notes 104–106 and accompanying text.

[172] *See infra* note 1011 and accompanying text and Table 13 (showing that, for example, adjusting the customer account threshold from 100,000 customer accounts to 10,000 customer accounts would increase the estimated costs from approximately $5 million to approximately $13.9 million).

[173] *See* proposed Rule 605(a)(7).

[174] An introducing broker-dealer is a broker-dealer that has a contractual arrangement with another firm, known as the carrying or clearing firm, under which the clearing/carrying firm agrees to perform certain services for the introducing firm. Usually, the introducing firm transmits its customer accounts and customer orders to the clearing/carrying firm, which executes the orders and carries the account. *See* Securities Exchange Act Release No. 31511 (Nov. 24, 1992), 57 FR 56973, 56978 (Dec. 2, 1992) (Net Capital Rule).

[175] Some broker-dealers utilize an ''omnibus clearing arrangement,'' where the clearing firm maintains one account for all of customer transactions of the introducing firm, rather than a ''fully disclosed introducing relationship.'' In an omnibus arrangement, the clearing firm does not know the identity of the customers of the introducing firm, whereas in a fully-disclosed arrangement, the clearing/carrying firm knows the names, addresses, securities positions, and other

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because the clearing broker may not have access to information about how many customer accounts a particular omnibus account represents, the proposal specifies that when an omnibus clearing arrangement is used the underlying customer accounts would be required to be counted as accounts carried by the introducing broker-dealer rather than by the clearing broker. Therefore, for purposes of Rule 605, a broker or dealer that utilizes an omnibus clearing arrangement for any of its underlying customer accounts would be considered to carry such underlying customer accounts when calculating the number of customer accounts that it introduces or carries.[176]

Requiring both introducing broker-dealers and carrying broker-dealers to prepare Rule 605 reports might result, in some instances, in the same underlying order being reflected on multiple broker-dealers' Rule 605 reports. However, Rule 605 does not require reports that reflect execution quality on an order-by-order basis and the separate reports would provide different views of execution quality specific to the group of orders handled by each broker-dealer. Moreover, the current structure of Rule 605 already contemplates that certain orders may be reflected on more than one report, in the case of orders that are received by one market center and then routed to another market center for execution.[177]

Proposed Rule 605(a)(7) states that any broker or dealer that meets or exceeds the customer account threshold and is also a market center shall produce separate reports pertaining to each function. Therefore, a broker-dealer that meets or exceeds the customer account threshold and is also a market center would be required to produce one report that includes all of the covered orders in NMS stocks that it received for execution when acting as a market center and a separate report that includes all of the covered orders in NMS stocks that it received for execution when acting as a broker-dealer. Requiring a firm to produce separate reports pertaining to its market center function and its broker-dealer function would allow market participants and other interested parties to view the firm's execution quality from the perspective of how it operates in each of these separate roles.

This aspect of the proposal would not change how a firm should determine when it is acting as a market center, as that term is defined in Rule 600(b)(46).[178] In particular, some firms that are larger broker-dealers also act as OTC market makers, which are a type of market center. Currently, to the extent that a dealer holds itself out as being willing to buy from and sell to its customers, or others, in the United States, an NMS stock for its own account on a regular or continuous basis otherwise than on a national securities exchange in amounts of less than a block size, that dealer is defined as an OTC market maker.[179] For example, if a broker-dealer executes certain types of orders internally (*e.g.,* fractional share orders, small-sized orders, or orders in particular symbols), that broker-dealer may be acting as an OTC market maker, and thus a market center, for those specific types of orders. Moreover, Rule 605 requires that any report pertaining to a market center include all covered orders that it received for execution from any person, whether executed at the market center or at any other venue.[180] As is the case under Rule 605 currently for market centers that route orders away, under the proposal, the fact that a larger broker-dealer has routed certain covered orders away for execution would not alone be the basis on which to determine that it did not act as a market center with respect to those orders.[181]

For a larger broker-dealer that is also a market center, the report pertaining to its broker-dealer function would cover all orders that the broker-dealer received for execution as part of its customer-facing line of business, whether executed internally or routed away. An order would need to be reflected on both the report regarding the firm's market center function and the report regarding its broker-dealer function, if the broker-dealer received the order from a customer and also acts as a market center for that type of order. Each report would provide a different view of the firm's execution quality based on a different aspect of its business, and because reports reflect orders grouped by symbol, order type, and size, would reflect different execution quality metrics to the extent that the group of orders covered by the different reports did not overlap completely.[182]

As proposed, pursuant to Rule 605(a)(7), a broker-dealer would be excluded from Rule 605's reporting requirements only with respect to its customer-facing broker-dealer function (as opposed to its function as market center, if applicable) as long as the

relevant data as to each customer. *See id.* at 56978 n.16.

[176] *See* proposed Rule 605(a)(7). For example, an introducing broker-dealer that utilizes an omnibus clearing arrangement for 100,000 customer accounts and separately carries 50,000 customer accounts would be considered, for purposes of proposed Rule 605, to carry 150,000 customer accounts. In contrast, a broker-dealer who introduces, on a fully-disclosed basis, 125,000 customer accounts would be considered, for purposes of proposed Rule 605, to introduce 125,000 customer accounts. In both cases, the introducing broker-dealers would exceed the proposed customer account threshold.

[177] *See* 17 CFR 242.605(a)(1).

[178] *See* 17 CFR 242.600(b)(46). The Commission is proposing to renumber the definition of ''market center'' as proposed Rule 600(b)(56).

[179] *See supra* note 28. *See also* Securities Exchange Act Release No. 37619A (Sept. 6, 1996), 61 FR 48290, 48318–19 (Sept. 12, 1996) (Order Execution Obligations) (stating that dealers that internalize customer order flow in particular stocks by holding themselves out to customers as willing to buy and sell on an ongoing basis would fall within the definition of ''OTC market maker'' as defined in the predecessor to Rule 602 of Regulation NMS, even though they may not hold themselves out to all other market participants, and that dealers that hold themselves out to particular firms as willing to receive customer order flow, and execute those orders on a regular or continuous basis, also would fall within the definition of an OTC market maker); *id.* at 48319 (stating that broker-dealers will not be considered to be holding themselves out as regularly or continuously willing to buy or sell a security if they occasionally execute a trade as principal to accommodate a customer's request, and that, in response to the suggestion of some commenters, the Commission has modified the proposed amendment to the definition of ''OTC market maker'' to make clear that more than an isolated transaction is necessary before a dealer is designated an OTC market maker).

[180] *See* 17 CFR 242.605(a)(1). We note that the staff has provided their views on a way that a firm might determine the scope of covered orders for which it acts as a market center, *see* Division of Market Regulation: Staff Legal Bulletin No. 12R (Revised), Question 4 (June 22, 2001), *available at https://www.sec.gov/interps/legal/slbim12a.htm* (''The Rule applies to broker-dealers insofar as they act as a 'market center' with respect to orders received from other persons. Consequently, for orders in securities for which Firm X does *not* act as an OTC market maker, Firm X would not be acting as a market center in those securities and therefore need not report on orders in those securities that it receives as an agent and routes elsewhere for execution. Conversely, the orders that Firm X receives from any person in the 500 securities in which it acts as an OTC market maker (and therefore is a market center) generally must be included in Firm X's monthly reports, even if Firm X ultimately routes some of the orders to other market centers for execution.''). Staff reports, Investor Bulletins, and other staff documents (including those cited herein) represent the views of Commission staff and are not a rule, regulation, or statement of the Commission. The Commission has neither approved nor disapproved the content of these staff documents and, like all staff statements, they have no legal force or effect, do not alter or amend applicable law, and create no new or additional obligations for any person.

[181] *See supra* notes 143–144 and accompanying text.

[182] For certain firms regarding certain symbols, order types, or order sizes, the group of orders for which the firm acts as a larger broker-dealer may overlap completely with the group of orders for which the firm acts as a market center. However, broker-dealer firms are structured in myriad different ways, and the degree of overlap among reports might not remain stable over time; therefore, requiring firms to produce reports according to the orders for which they act as a market center and the orders for which they act as a broker-dealer would help keep the reports consistent with firms' lines of business.

number of customer accounts that it introduces or carries continues to be less than the customer account threshold. A broker-dealer would no longer be excluded from Rule 605 once and as long as it meets or exceeds the customer account threshold; however, a broker-dealer that meets or exceeds the customer account threshold for the first time would have a grace period before being required to comply with Rule 605's reporting requirements, as described further below.

Proposed Rule 605(a)(7) states that a broker or dealer that meets or exceeds the customer account threshold shall be required to produce reports pursuant to this section for at least three calendar months (''Reporting Period''). The Reporting Period would begin the first calendar day of the next calendar month after the broker or dealer met or exceeded the customer account threshold, unless it is the first time the broker-dealer has met or exceeded the customer account threshold.[183] Any time after a broker or dealer has been required to produce reports pursuant to this proposed section for at least a Reporting Period, if a broker or dealer falls below the customer account threshold, the broker or dealer would not be required to produce a report pursuant to this paragraph for the next calendar month.[184] The Reporting Period would start on the first day of the next calendar month after the customer account threshold has been crossed because this timing would align with Rule 605's monthly reporting period and avoid requiring broker-dealers to produce a report that covers a partial month, which would be less comparable with the monthly reports of other broker-dealers. Moreover, brokers-dealers that may at times fall below the customer account threshold would be required to produce reports pursuant to Rule 605 for at least three calendar months, because this minimum reporting period would help ensure a period of continuity in reporting. If instead a broker-dealer could fluctuate in and out of being required to comply with the reporting requirements from month-to-month, it would potentially be disruptive to the broker-dealer to have to coordinate compliance with the Rule on some months but not others and could interfere with customers' or market participants' ability to look at a broker-dealer's execution quality over time by analyzing historical data.[185]

The Commission is proposing that, the first time a broker or dealer has met or exceeded the customer account threshold, there would be a grace period of three calendar months before the Reporting Period begins and the broker or dealer must comply with the reporting requirements of Rule 605.[186] A limited three-month grace period is appropriate because it would provide a broker-dealer that crosses the customer account threshold for the first time with a period of time in which to come into compliance with Rule 605's reporting requirements. The three-month grace period would afford a broker-dealer adequate time to develop the systems and processes and organize the resources necessary to generate the reports pursuant to Rule 605, while still requiring the broker-dealer to begin reporting without an overly long delay. At the same time, should a broker-dealer subsequently fall below the customer reporting threshold, the Commission preliminarily believes that the broker-dealer should already have the necessary systems and processes in place and therefore a grace period would not be necessary if that broker-dealer again meets or exceeds the customer account threshold and becomes subject to Rule 605's requirements. The Commission notes that Rule 606 similarly provides for a three-month grace period for brokers or dealers subject to Rule 606(b)(3)'s reporting requirements for the first time only.[187]

Rule 605 requires that reporting entities calculate certain statistics based on the time of order receipt.[188] Moreover, Regulation NMS defines ''time of order receipt'' based on the time an order was received by a market center for execution.[189] In conjunction with the proposed expansion of Rule 605 to cover larger broker-dealers, it is necessary to modify this definition to specify how broker-dealers that are not acting as market centers would be required to calculate ''time of order receipt.'' The Commission has considered requiring broker-dealers to calculate the ''time of order receipt'' based on the time that the broker-dealer received the order or on the time that the broker-dealer transmitted the order to a market center for execution. Measuring ''time of order receipt'' based on when a broker-dealer received the order would provide a view of how that broker-dealer handled that order from the time the order was within its control, rather than limiting that view to what happened after the broker-dealer sent the order to a particular market center for execution. In this way, calculating execution quality statistics based on the time that a broker-dealer received the order could provide information about whether a broker-dealer's delay in sending the order to a market center for execution may have affected the execution quality obtained for that order, because the execution quality statistics would be measured based on the prevailing market prices at that time.[190] Accordingly, the Commission is proposing to modify the definition of ''time of order receipt'' to specify that, in the case of a broker or dealer that is not acting as a market

[183] *See* proposed Rule 605(a)(7).

[184] *See id.*

[185] When discussing the 2018 amendments to Rule 605(a)(2) that required market centers to keep Rule 605(a) reports posted on a public website for a period of three years, the Commission stated that it expected customers and the public to use the historical information to compare information from the same time period. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58380 (also stating that, with respect to market centers voluntarily posting Rule 605(a) reports that were created prior to the amended rule's effectiveness, making historical data available to customers and the public could be useful to customers or market participants seeking to analyze such data).

[186] *See* proposed Rule 605(a)(7). After the three calendar month grace period, the Reporting Period would begin on the first calendar day of the fourth calendar month after the broker or dealer has met or exceeded the customer account threshold. *See id.* As described above, a broker-dealer that meets or exceeds the customer account threshold would be required to produce Rule 605 reports for at least a Reporting Period. *See supra* notes 183–184 and accompanying text. Therefore, a broker-dealer that crosses the customer account threshold for the first time would be required to comply with the reporting requirements of Rule 605 for at least a Reporting Period, even if that broker-dealer falls below the customer account threshold during the grace period.

[187] *See* 17 CFR 242.606(b)(4).

[188] *See, e.g.,* 17 CFR 242.605(a)(1)(ii)(D) (measuring, for shares executed with price improvement, the share-weighted average period from the time of order receipt to the time of order execution).

[189] *See* 17 CFR 242.600(b)(92). *See also* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75423 (''The definition [of 'time of order receipt'] is intended to identify the time that an order reaches the control of the market center that is expected, at least initially, to execute the order.''). The Commission is proposing to renumber the definition of ''time of order receipt'' as proposed Rule 600(b)(109).

[190] When adopting Rule 605, the Commission stated that a market center will use the time and consolidated BBO at the time it received the order, rather than the time and consolidated BBO when the venue to which an order was forwarded received the order, to calculate the required statistics. *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75423. The Commission stated that a market center should be held accountable for all orders that it receives for execution and should not be given an opportunity to exclude difficult orders by routing them to other venues, and that from the customer's perspective the fact that a market center chooses to route the order elsewhere does not reduce the customer's interest in a fast execution that reflects the consolidated BBO as close to the time of order submission as possible. *See id.* This same reasoning applies to orders that a broker-dealer receives and then routes to another venue for execution, and supports measuring the time of order receipt from the time that the broker-dealer receives the order.

center, the time of order receipt is the time that the order was received by the broker or dealer for execution.[191]

The Commission is mindful that some of Rule 605's execution quality statistics may as a general matter differ for the larger broker-dealers, as compared to market centers, to the extent that some of these larger broker-dealers generally or exclusively route orders away. However, it is appropriate for broker-dealers to report on the same execution quality statistics as market centers because the reported statistics can be understood in the context of the specific reporting entity, and the detailed execution quality statistics would allow customers and other market participants to parse the differences among the statistics for each reporting entity. For example, Rule 605 requires statistics for the number of shares executed at the receiving market center and the number of shares executed at any other venue.[192] As discussed above, broker-dealers that generally route the orders that they receive to other venues for execution, and thereby would report these shares as being executed at another venue, may execute certain portions of their order flow internally (*e.g.,* fractional shares).[193] While the Commission considered whether or not broker-dealers should be required to provide execution quality statistics for both shares executed at the receiving broker-dealer and shares executed at any other venue, the Commission decided to propose to keep both of these statistics in the Rule 605 reporting requirements for broker-dealers so as to capture all orders that broker-dealers receive for execution as part of their customer-facing broker-dealer function.[194] Further, differences in certain statistics for broker-dealers as compared to market centers may be more reflective of differences in business models rather than effectiveness in achieving execution quality for covered orders because of differences in order handling practices. The Commission understands that these differences are well-known and are taken into account by market participants when evaluating execution quality statistics. For example, broker-dealers that route customer orders may have consistently longer time to executions as compared to market centers for similar orders, because of the time it takes to route these orders, but this difference is well understood by market participants.

The Commission is also mindful that, for orders routed to other venues for execution, broker-dealers may not have all of the information needed to calculate the proposed statistics at the time of order execution. However, these broker-dealers should be able to obtain the needed information in time to prepare the required reports. Broker-dealers would need to calculate their execution quality statistics, or engage a vendor to calculate the statistics on their behalf, on a monthly basis. At the time that the broker-dealer or its vendor would need to calculate the execution quality statistics, the broker-dealer would have received any needed information about the order's execution from the execution venue and be able to obtain any needed historical price information from publicly available data sources, such as the exclusive plan processors (''exclusive SIPs'').[195] For example, a broker-dealer that routed an order away for execution would receive time of order execution and execution price as part of the trade confirmation provided by the execution venue. The broker-dealer could then use historical price information available via the exclusive SIPs to determine the NBBO at the time of order receipt and at the time of order execution, the number of shares displayed at the NBBO, and the best available displayed price, if such price is being disseminated, and use this data to calculate the required execution quality statistics.[196]

Request for Comment

The Commission seeks comment generally on the proposed expansion of Rule 605 reporting requirements to include larger broker-dealers that meet or exceed the customer account threshold, as well as the other proposed changes to Rule 605 and Rule 600(b) discussed above. In particular, the Commission solicits comment on the following:

1. Should Rule 605 be expanded to apply to broker-dealers? Why or why not? Do commenters agree that it would be useful for customers of certain broker-dealers to be able to access execution quality statistics that are specific to those broker-dealers, rather than needing to rely on the execution quality statistics reported by the market centers to which the broker-dealers route? Do commenters agree that market centers may provide different execution quality to orders based on the routing broker-dealer? Please explain and provide data.

2. Do commenters agree that it would be useful for broker-dealers that are also market centers to produce separate reports pertaining to each function? Why or why not? Do commenters agree that broker-dealers that are also market centers should be required to include in the report pertaining to their market center function all covered orders for which they act as a market center, including as an OTC market maker, rather than only those covered orders executed at the market center? Do commenters agree that broker-dealers that are also market centers should be required to include in the report pertaining to their broker-dealer function all of the covered orders in NMS stocks that they received for execution from any customer, rather than only those orders that do not pertain to their market center function (*i.e.,* those orders for which they do not act as a market center)? Would broker-dealers that are also market centers encounter any specific difficulties when determining which orders to include in each report? Please explain.

3. Is a numerical customer account threshold the proper criterion for determining whether a broker-dealer should be subject to the Rule 605 reporting requirements? If so, is 100,000 or more customer accounts the appropriate amount? Why or why not? If not, should be it higher or lower (*e.g.,* 500,000 or more customer accounts or 10,000 or more customer accounts)? If so, by what amount? Is it appropriate to consider both the number of customer accounts that the broker-dealer carries and the number of customer accounts

[191] *See* proposed Rule 600(b)(109). The time that the order is received by the market center for execution should be the same as the time that the order is received by the broker-dealer for execution when the broker-dealer also acts as a market center for that order.

[192] *See* 17 CFR 242.605(a)(1)(i)(D) and (E). As discussed herein, the Commission is proposing to modify Rule 605(a)(1)(i)(D) to also cover the number of shares executed at the receiving broker or dealer. *See supra* note 155 and accompanying text.

[193] *See supra* note 34 and accompanying text.

[194] If a broker-dealer does not execute any covered orders internally, then that broker-dealer's Rule 605 report would not reflect any shares executed at the receiving broker-dealer. For discussion of what orders broker-dealers that are market centers would include in their reports pertaining to their market center function, see *supra* notes 178–180 and accompanying text.

[195] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18598–99 (describing that the exclusive SIPS, among other things, disseminate core data, which currently consists of: (1) the price, size, and exchange of the last sale; (2) each exchange's current highest bid and lowest offer and the shares available at those prices; and (3) the NBBO). A securities information processor (''SIP'') is defined in section 3(a)(22)(A) of the Exchange Act. *See* 15 U.S.C. 78c(a)(22)(A). Further, an ''exclusive processor'' (also known as an exclusive SIP) is defined in section 3(a)(22)(B) of the Exchange Act. *See* 15 U.S.C. 78c(a)(22)(B).

[196] With respect to NMLOs, the broker-dealer could also use this historical price information available via the exclusive SIPs to determine when the order became executable, based on when the NBBO first reached the order's limit price.

that the broker-dealer introduces? Why or why not? Do commenters believe that it would be more useful to consider the trading volume, either based on share volume or notional volume, or both, of a broker-dealer's customers when setting the reporting threshold? Why are why not? Please explain and provide data to support your argument. Are there alternative approaches that the Commission should adopt in expanding Rule 605's reporting requirements to broker-dealers? If so, please explain the approach in detail, including the benefits and costs of the approach.

4. Should the Commission require all broker-dealers to report pursuant to Rule 605 irrespective of the number of customer accounts that the broker-dealer carries or introduces? Or should such a requirement be subject to a de minimis exclusion? Why or why not? If so, what would be an appropriate de minimis exclusion? Please explain and provide data, if possible.

5. Is three months an appropriate timeframe to use for the Reporting Period, *i.e.,* the minimum length of time for which a broker-dealer would need to comply with Rule 605's reporting requirements once its number of customer accounts meets or exceeds the customer account threshold? Would a shorter or longer time period (*e.g.,* one, two or six months) be more appropriate? If so, by what amount? Does whether or not a broker-dealer uses or could use an outside vendor to prepare reports pursuant to Rule 605 affect this answer? Please explain.

6. Is three months an appropriate grace period from Rule 605's reporting requirements for a broker-dealer that has met or exceeded the customer account threshold for the first time? Would a shorter or longer time period be more appropriate (*e.g.,* one month, two months, or six months)? Do commenters agree that a grace period would not be necessary for broker-dealers that have previously equaled or exceeded the customer account threshold, but subsequently have fallen below the threshold and stopped reporting and then need to restart reporting? If not, what grace period do commenters think would be appropriate? Would one month be sufficient in this context? Are there any other circumstances in which a broker-dealer that has met or exceeded the customer account threshold would need an additional grace period from Rule 605's reporting requirements? Please explain.

7. Should a broker-dealer that is not a market center be required to calculate time of order receipt based on when that broker-dealer received the order? Why or why not? Would it be more useful to customers or other market participants for a broker-dealer that generally routes customer orders to calculate time of order receipt based on when that broker-dealer sent the order to a market center for execution? Please explain and provide data, if possible.

8. Should broker-dealers be required to produce all of the detailed execution quality statistics set forth in Rule 605? Why or why not? Do commenters agree that broker-dealers' customers and other market participants would be able to interpret differences in these execution quality statistics among reporting entities that may be attributable to the context of their different types of business? Do commenters believe that there are any additional execution quality statistics that would be useful to require of broker-dealers? Please explain and provide data, if possible.

9. Would it be difficult for broker-dealers to obtain any of the information needed to calculate the Rule 605 statistics? Why or why not? If so, which statistics in particular? Would broker-dealers have some or all of the information needed to calculate their Rule 605 statistics already, including to meet their obligations to assess whether they are providing best execution for these orders? Do commenters agree that broker-dealers would be able to obtain needed information from the execution venues to which they routed the orders or publicly available sources? Should the Commission exclude certain proposed execution quality statistics that are specific to certain order types, such as executable NMLOs? Why or why not? Please explain.

B. Qualified Auction Mechanisms

Separately, the Commission is proposing rules that generally would require that individual investor orders be exposed to order-by-order competition in fair and open auctions designed to obtain the best prices before such orders could be internalized by wholesalers or any other type of trading center that restricts order-by-order competition.[197] Under those proposed rules, a restricted competition trading center would not be allowed to execute internally a segmented order for an NMS stock until after a broker or dealer has exposed such order to competition at a specified limit price in a qualified auction that meets certain requirements and is operated by an open competition trading center.[198] An ''open competition trading center'' would be a national securities exchange or NMS Stock ATS that meets certain requirements, including being transparent and having a substantial trading volume in NMS stocks independent of qualified auctions.[199] A ''qualified auction'' would be an auction operated by an open competition trading center pursuant to specified requirements that are designed to achieve competition.[200]

If the Commission adopts the Order Competition Rule Proposal and a national securities exchange or NMS Stock ATS that serves as an open competition trading center is required to prepare execution quality reports under current Rule 605, that national securities exchange or NMS Stock ATS would be required to include covered orders that it received for execution in a qualified auction within its blended executing quality statistics, which also would include trading activity outside of the qualified auctions.[201]

The Commission is concerned that there may be differences in execution quality for orders executed within proposed qualified auctions, as compared to other orders executed by market centers outside of these qualified auctions, that would not be apparent in blended execution quality statistics. For example, orders submitted to a qualified auction may be more or less likely to receive price improvement, and may have systematically different fill rates, as compared to similar orders executed in other trading mechanisms. In addition, the Order Competition Rule Proposal would propose both a minimum and maximum time period for

[197] For a full description and discussion of the order competition rule proposal, *see* Securities Exchange Act Release No. 96495 (Dec. 14, 2022) (File No. S7–31–22) (Order Competition Rule) (''Order Competition Rule Proposal''); proposed Rule 615.

[198] *See* Order Competition Rule Proposal; proposed Rule 600(b)(87) (defining ''restricted competition trading center''); proposed Rule 600(b)(91) (defining ''segmented order''); proposed Rule 615(a) (describing the order competition requirement).

[199] *See* Order Competition Rule Proposal; proposed Rule 600(b)(64) (defining ''open competition trading center'').

[200] *See* Order Competition Rule Proposal; proposed Rule 600(b)(81) (defining ''qualified auction''); proposed Rule 615(c) (setting forth requirements for operation of a qualified auction).

[201] As discussed further below, the Commission is proposing to eliminate the separate reporting categories for inside-the-quote limit orders, at-the-quote limit orders, and near-the-quote limit orders, and create new reporting categories for executable NMLOs and beyond-the-midpoint limit orders. *See infra* sections IV.B.2.(a) and IV.B.2.(b). While, as proposed, orders submitted to qualified auctions may in many instances be classified as beyond-the-midpoint limit orders, this reclassification would not resolve the Commission's concern about blending execution quality statistics for orders executed in qualified auctions with orders executed outside of these auctions.

the qualified auction.[202] Therefore, the time to execution statistics for orders submitted to a qualified auction may be systematically different from the time to execution statistics of other orders executed at a market center. Further, if a market center receives covered orders for execution in a qualified auction, then that market center would not have discretion about whether to submit these orders into a qualified auction and therefore the distinction between orders executed by the market center within and outside of a qualified auction would not reflect any decision-making on the part of the market center. Thus, it would be more useful for market participants to be able to review execution quality statistics that are specific to covered orders submitted to a qualified auction.

Accordingly, the Commission is proposing to amend Rule 605(a)(1) to state that market centers that operate a qualified auction must prepare a separate report pursuant to Rule 605 pertaining only to covered orders that the market center receives for execution in a qualified auction.[203] This proposed requirement for separate reports is limited to market centers that operate proposed qualified auctions, and would not extend to market centers or broker-dealers that route orders away for execution in a qualified auction. Therefore, a market center or broker-dealer that routes covered orders to an open competition trading center for execution within a proposed qualified auction would not be required to separately report on or otherwise distinguish orders routed to qualified auctions from other types of orders routed away for execution in its Rule 605 reports.[204] In this way, the proposal would follow current Rule 605's focus on the overall execution quality that the reporting entity provided to all covered orders that it received for execution.[205] Having market centers and broker-dealers report on the execution quality provided to orders, regardless of where they are executed, would inform market participants and other observers about overall execution quality that the market center or broker-dealer is able to obtain, including when the market center or broker-dealer decides whether and where to route orders to receive such executions. Further, distinctions between whether an order was routed to a qualified auction or not may depend on the characteristics of the order, such as whether it is a segmented order, rather than the performance of the market center or broker-dealer that routed the order. As such, it would be of more limited utility to have a market center or broker-dealer that routes orders to a qualified auction to produce a separate Rule 605 report specific to such orders.

Although market centers and broker-dealers would not be required to produce a separate Rule 605 report pertaining to orders that they route to a qualified auction, Rule 606 requires routing broker-dealers to disclose certain regularly-used execution venues to which they route orders, and a report prepared by a broker-dealer pursuant to Rule 606 would be required to indicate that orders were routed to a particular qualified auction.[206] A customer of a broker-dealer could then analyze whether and to what extent the broker-dealer routes to a particular market center's qualified auctions (using reports prepared pursuant to Rule 606), and evaluate the execution quality provided by that market center's qualified auctions (using reports prepared pursuant to Rule 605).

The Commission considered extending the proposed requirement for separate Rule 605 reports beyond proposed qualified auctions to include orders submitted to any trading mechanism that seeks to provide liquidity to the orders of individual investors. For example, several national securities exchanges operate retail liquidity programs.[207] However, in the Order Competition Rule Proposal the Commission is proposing a prohibition on certain facilities that are limited, in whole or in part, to the execution of segmented orders and this prohibition would apply to many of the retail liquidity programs currently operated by national securities exchanges.[208]

Request for Comment

The Commission seeks comment on the proposal to require a market center that operates a qualified auction to prepare a separate report under Rule 605 for covered orders that were submitted to a qualified auction if the Order Competition Rule Proposal is adopted. In particular, the Commission solicits comment on the following:

10. Should market centers that operate a proposed qualified auction be required to prepare a separate Rule 605 report for covered orders that are submitted to their qualified auctions? Why or why not? Do commenters agree with limiting this separate reporting requirement to market centers that operate a proposed qualified auction, and not to either broker-dealers that are not market centers or market centers that do not operate a qualified auction? Please explain.

11. Should this separate reporting requirement be limited to a trading mechanism that meets the proposed requirements for a ''qualified auction''? Would it be more useful if a market center prepared a separate report for covered orders submitted to any trading mechanism that seeks to provide liquidity to the orders of individual investors (*e.g.,* a national securities exchange's retail liquidity program), whether or not that trading mechanism operates a ''qualified auction''?

12. Do commenters believe that there are any additional execution quality statistics that would be useful to require of a market center that operates a proposed qualified auction to facilitate comparison among different qualified auctions? For example, would it be useful for a market center that operates a proposed qualified auction to provide data on any price improvement provided in the qualified auction as

[202] *See* Order Competition Rule Proposal; proposed Rule 615(c)(2).

[203] *See* proposed Rule 605(a)(1).

[204] If a larger broker-dealer is also a market center and its market center operates a qualified auction mechanism, that aspect of the market center would be subject to the separate reporting requirement.

[205] For example, currently Rule 605 does not require market centers to distinguish among covered orders routed to particular types of away market centers. Instead, a market center's execution quality statistics are blended statistics pertaining to all covered orders that the market center received for execution, with the limited exception of the statistics for cumulative number of shares of covered orders executed at the receiving market center and at any other venue. *See* 17 CFR 242.605(a)(1).

[206] *See* 17 CFR 242.606(a)(1). For example, if a broker-dealer operates an ATS and that ATS has qualified auctions and a continuous order book, the broker-dealer's Rule 606 report would be required to disclose information about orders that were routed to the ATS's qualified auctions separately from orders that were sent directly to the ATS's continuous order book.

[207] Retail liquidity programs are programs for retail orders seeking liquidity that allow market participants to supply liquidity to such retail orders by submitting undisplayed orders priced at least $0.001 better than the exchange's protected best bid or offer. Each program results from a Commission approval of a proposed rule change made on Form 19b–4 combined with a conditional exemption, pursuant to section 36 of the Exchange Act, from 17 CFR 242.612 (the ''Sub-Penny Rule'') to enable the exchange to accept and rank (but not display) the sub-penny orders. *See, e.g.,* Securities Exchange Act Release Nos. 85160 (Feb. 15, 2019), 84 FR 5754 (Feb. 22, 2019) (SR–NYSE–2018–28) (approving the NYSE retail liquidity program on a permanent basis and granting the exchange a limited exemption from the Sub-Penny Rule to operate the program); 86194 (June 25, 2019), 84 FR 31385 (July 1, 2019) (SR–BX–2019–011) (approving Nasdaq BX, Inc.'s retail price improvement program on a permanent basis and granting the exchange a limited exemption from the Sub-Penny Rule to operate the program).

[208] *See* Order Competition Rule Proposal. The Commission discusses a number of alternatives in the Order Competition Rule Proposal. *See id.* To the extent that any retail liquidity program is retained, separate execution quality statistics specific to orders submitted to those programs may be useful to investors.

measured in relation to any additional price matching offered by the wholesaler that routed the order to the qualified auction? Please explain and provide data, if possible.

C. ATSs and Single-Dealer Platforms

Currently under Rule 605, firms that operate two separate markets must prepare separate reports for each market center.[209] For example, for a firm that acts both as an exchange market maker and as an OTC market maker, each function would be considered a separate market center and Rule 605 requires the firm to prepare separate reports. The requirement to produce separate Rule 605 reports for separate markets allows market participants to assess the execution quality of each market individually, and prevents differences in the nature of each market from obscuring information about execution quality.

Regulation ATS requires each ATS to register as a broker-dealer.[210] Many broker-dealers that operate NMS Stock ATSs have separate lines of business that are distinct from their ATSs, yet also relate to the trading of NMS stocks.[211] In addition, one EMSAC panelist suggested that the Commission require all ATSs and dark pools (*i.e.,* ATSs that do not publish quotations) to report separately from their affiliated broker-dealers under Rule 605.[212] The Commission believes there is a need to address directly what Rule 605 requires with respect to reporting by firms that operate ATSs. By specifying that a broker-dealer that operates an ATS must produce Rule 605 reports that are specific to the ATS and separate from the broker-dealer operator's other trading activity, the Commission intends to increase transparency and regulatory compliance. Accordingly, the Commission proposes to specify in Rule 605(a)(1) that ATSs (as defined in Regulation ATS [213]) shall prepare reports separately from their broker-dealer operators, to the extent such entities are required to prepare reports.[214]

Some OTC market makers, such as wholesalers, operate SDPs through which they execute institutional orders in NMS stocks against their own inventory.[215] Institutional customers often communicate their trading interest using immediate-or-cancel orders (''IOCs'') or IOIs on SDPs.[216] SDPs account for a nontrivial amount of trading volume overall (for example, SDPs accounted for approximately 4% of total trading volume in Q1 2022) and a significant portion of trading volume executed by wholesalers.[217] Co-mingling SDP activity with other market center activity in Rule 605 reports may obscure differences in execution quality or distort the general execution quality metrics for the market center.[218] It would be useful if SDPs reported execution quality statistics separately from those of their associated broker-dealer under Rule 605, so that their customers and other market participants would be able to distinguish SDP activity from more traditional dealer activity. Separate statistics may be particularly useful if a dealer provides an SDP (*i.e.,* a separate routing destination for the execution of orders) for a particular group of customers or type of orders. Therefore, the Commission is proposing to require in Rule 605(a)(1) that any market center that provides a separate routing destination that allows persons to enter orders for execution against the bids and offers of a single dealer shall produce a separate report pertaining only to covered orders submitted to such routing destination.[219]

Request for Comment

The Commission seeks comment on the proposal to specify that an ATS must produce reports separately from its broker-dealer operator, and to require that any market center that provides a separate routing destination that allows persons to enter orders against the bids and offers of a single dealer must produce separate reports pertaining to orders submitted to that routing destination. In particular, the Commission solicits comment on the following:

13. Is it useful for an ATS to produce reports pursuant to Rule 605 that are specific to covered orders submitted to the ATS and separate from orders submitted in connection with other trading activity of its broker-dealer operator? Why or why not?

14. Should a broker-dealer operating an SDP be required to produce reports pursuant to Rule 605 that are specific to orders sent to that routing destination and separate from other trading activity by that dealer, as proposed? Why or why not? Do commenters agree that the description of ''a market center that provides a separate routing destination that allows persons to enter orders for execution against the bids and offers of a single dealer'' accurately describes SDPs? If not, what is a more accurate description of an SDP? Please explain.

IV. Proposed Modifications to Scope of Orders Covered and Required Information

Rule 605 reports group orders by both order size and order type, and require certain standardized information for all types of orders and additional information for market orders and marketable limit orders. The Commission is proposing to modify the order size and order type groupings, and is proposing to make changes to the required information for: all types of orders; market and marketable limit

[209] *See* 17 CFR 242.605(a)(1) (requiring ''every'' market center to produce a report). *See also* Plan, at n.1 (''An entity that acts as a market maker in different trading venues (*e.g.,* as specialist on an exchange and as an OTC market maker) would be considered as a separate market center under the Rule for each of those trading venues. Consequently, the entity should arrange for a Designated Participant for each market center/trading venue (*e.g.,* an exchange for its specialist trading and an association for its OTC trading).''). For a description of ''Designated Participant'' as defined in the Plan, *see supra* note 47.

[210] *See* 17 CFR 242.301(b)(1). 17 CFR 242.301 through 17 CFR 242.304 is generally known as ''Regulation ATS.''

[211] *See, e.g.,* Securities Exchange Act Release No. 83663 (July 18, 2018), 83 FR 38768, 38771 (Aug. 7, 2018) (Regulation of NMS Stock Alternative Trading Systems) (stating that ATSs that trade NMS stocks are increasingly operated by multi-service broker-dealers that engage in significant brokerage and dealing activities in addition to operation of their ATS, and that, for instance, the broker-dealer operator of an NMS Stock ATS may also operate an OTC market making desk or principal trading desk, or may have other business units that actively trade NMS stocks on a principal or agency basis in the ATS or at other trading centers).

[212] *See* Healthy Markets II at 2. *See also* Healthy Markets III at 4 (recommending that the Commission modernize and mandate Rule 605 disclosure for all NMS ATS operators separate and distinct from any affiliated broker-dealer). Additionally, a commenter to the Concept Release on Equity Market Structure recommended that the Commission require all ATSs and dark pools to report under Rule 605. *See* KOR Group I at 3.

[213] 17 CFR 242.300 *et seq.*

[214] *See* proposed Rule 605(a)(1).

[215] Wholesalers and other OTC market makers either execute orders themselves or instead further route the orders to other venues. An SDP always acts as the counterparty to any trade that occurs on the SDP. *See, e.g., Where Do Stocks Trade?,* FINRA.org (Dec. 3, 2021), *available at https://www.finra.org/investors/insights/where_do_stocks_trade* for further discussion.

[216] *See infra* note 615 and accompanying text.

[217] *See infra* notes 618 and 769 and accompanying text.

[218] For example, IOC orders typically have different execution profiles than other types of orders, including lower fill rates, and therefore including orders submitted to a market center's SDP with its other orders will effect a downwards skew on the market center's fill rates. *See infra* note 723 and accompanying text; Table 6.

[219] *See* proposed Rule 605(a)(1). To the extent that a reporting firm produces more than one Rule 605 report, the firm could label each report with the type of business reflected on the report. As discussed above, the Commission proposes to expand the scope of Rule 605 to include larger broker-dealers. *See supra* section III.A. It is possible that firms would need to prepare several Rule 605 reports if they are both a larger broker-dealer and a market center and need to prepare more than one report as a market center, pursuant to proposed Rule 605(a)(1).

order types; and nonmarketable order types. The modifications described below would apply to Rule 605 reports produced by all reporting entities, including larger broker-dealers.

A. Covered Order

The Commission proposes to expand the definition of ''covered order'' in a number of ways.[220] The Commission proposes to include certain orders received outside of regular trading hours and orders submitted with stop prices. Additionally, the Commission is addressing whether Rule 605 requires non-exempt short sale orders to be incorporated into Rule 605 reporting when a price test restriction is in effect for the security.

1. Orders Submitted Pre-Opening/Post-Closing

Currently, Rule 605 reports are required to include only orders received during regular trading hours [221] at a time when an NBBO is being disseminated. The Commission excluded orders submitted during the pre-opening or after the close, among other order types, from the scope of reporting because nearly all of Rule 605's statistical measures required the availability of the NBBO at the time of order receipt as a benchmark.[222] At the time of adoption, the Commission stated that there are substantial differences in the nature of the market between regular trading hours and after-hours, and orders executed at these times should not be blended together in the same statistics.[223] Similarly, orders for which customers requested special handling, including orders to be executed at a market opening price, are excluded from Rule 605 reports because their inclusion would skew the general statistics.[224]

Market participants submit limit orders prior to market open, and these orders are not captured in current Rule 605 reports.[225] Although NMLOs submitted outside of regular trading hours may represent a relatively small percentage of NMLO orders overall, pre-open NMLO submission volume includes a higher concentration of individual investor orders.[226] In order to provide increased visibility into execution quality for individual investor orders, including those submitted outside of regular trading hours, the Commission proposes to expand the scope of Rule 605 reporting to include certain NMLOs submitted outside of regular trading hours if they become executable after the opening or reopening of trading during regular trading hours.[227] The Commission is proposing to expand the definition of ''covered order'' to include any NMLO received by a market center, broker, or dealer outside of regular trading hours or at a time when a national best bid and national best offer is not being disseminated and, if executed, is executed during regular trading hours.[228] As discussed below, the Commission is proposing that NMLOs would be benchmarked from the time they become executable rather than the time of order receipt.[229] The executability of limit orders that are received while an NBBO is not being disseminated would be determined with reference to the opening or re-opening price of the security. This would allow market participants to evaluate execution performance for NMLOs submitted outside of regular trading hours if they become executable during regular trading hours.

The Commission proposes to amend the definition of ''marketable limit order'' to specify that the marketability of an order received when the NBBO is not being disseminated would be determined using the NBBO that is first disseminated after the time of order receipt. Specifically, the Commission proposes that an order received at a time when a national best bid and national best offer is not being disseminated would be a marketable limit order if it is a buy order with a limit price equal to or greater than the national best offer at the time that the national best offer is first disseminated during regular trading hours after the time of order receipt, or if it is a sell order with a limit price equal to or less than the national best bid time at the time that the national best bid is first disseminated during regular trading hours after the time of order receipt.[230]

Any limit order received outside of regular trading hours or during a trading halt that is marketable based on the first disseminated NBBO during regular trading hours after the time of order receipt would not be a covered order for purposes of Rule 605.[231] The Commission's proposed definition excludes market orders and marketable limit orders submitted prior to open or during a trading halt because such orders would generally execute at the opening or re-opening price. Therefore, their inclusion in general market and marketable limit order statistics would skew both time to execution statistics and other measures of execution quality if aggregated with market and marketable limit orders received during regular trading hours. While including market and marketable limit orders submitted prior to open or during a trading halt within the definition of covered order and requiring that the execution statistics for these types of orders be reported as a separate order type category would avoid the concern about skewed statistics, it would add to the complexity of the report.

The current definition of covered order includes orders received during regular trading hours while an NBBO is being disseminated but *before* the primary listing market has disseminated its first quotations in the security. Prior to a primary listing market disseminating its first quotations in a security, disseminated quotations often reflect spreads that vary significantly from the norm.[232] To prevent such quotations from skewing the execution quality statistics, the Commission exempted orders from inclusion in Rule

[220] *See* proposed Rule 600(b)(30).

[221] ''Regular trading hours'' is defined as the time between 9:30 a.m. and 4:00 p.m. Eastern Time, or such other time as is set forth in the procedures established pursuant to 17 CFR 242.605(a)(2). *See* 17 CFR 242.600(b)(77). The Commission is proposing to renumber the definition of ''regular trading hours'' as proposed Rule 600(b)(91).

[222] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421.

[223] *See id.,* text accompanying note 39. Specifically, the Commission stated that the average quoted spread, average effective spread, and trade price volatility increased significantly for certain securities after the close of regular trading hours. *See id.* at n.39.

[224] *See id.* at 75421.

[225] *See supra* notes 123–125 and accompanying text (commenter to 2018 Rule 606 Amendments and petitioner for rulemaking recommending inclusion of orders submitted prior to market open).

[226] Analysis of CAT data found that NMLOs submitted prior to open and designated as only able to execute during regular hours make up only a small percentage of order flow when compared to a sample 10-minute window of NMLOs submitted during regular hours. However, the analysis shows that individual investor orders are relatively concentrated in order flow submitted outside of regular market hours. Specifically, pre-open submission volume contains a larger percentage of individual investor shares than the sample time window during regular trading hours, at least for off-exchange market centers. *See infra* notes 672–673 and accompanying text.

[227] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include executable NMLOs and executable orders submitted with stop prices).

[228] *See* proposed Rule 600(b)(30).

[229] *See infra* section IV.B.2.(a).

[230] *See* proposed Rule 600(b)(57).

[231] For example, a market or marketable limit order that is not received by a market center or broker-dealer during regular trading hours at a time when the NBBO is being disseminated would not be a covered order under proposed Rule 600(b)(30). In addition, the covered order definition would continue to exclude any order for which the customer requests special handling for execution, including orders to be executed at a market opening price, *see* proposed Rule 600(b)(30), and therefore market-on-open (''MOO'') orders and limit-on-open (''LOO'') orders would be excluded.

[232] *See* Letter from Annette L. Nazareth, Director, Division of Market Regulation to Theodore Karn, President, Market Systems, Inc., dated June 22, 2001 (''Market Systems Exemptive Letter'') at 2.

605 reports that are received prior to the dissemination of the primary listing market's first firm, uncrossed quotations for a trading day (''Opening Exemption'').[233] With respect to orders received during regular trading hours but before the primary listing market has disseminated its first firm, uncrossed quotation, the Commission continues to believe, for the same reasons it granted this exemption, that including such orders could distort execution quality statistics. Therefore, the Commission is proposing to incorporate this exemptive relief into the proposed definition of covered order with respect to market or limit orders received during regular trading hours at a time when an NBBO is being disseminated.[234] However, pursuant to the proposed amendments to Rule 605, NMLOs (including orders submitted with stop prices) received outside of regular trading hours or at a time when an NBBO is not being disseminated could be considered covered orders, provided the NMLOs were not executed outside of regular trading hours.[235] Inclusion of these orders in Rule 605 reports would be useful to market participants, even though such orders necessarily would be received before the primary listing market has disseminated its first firm, uncrossed quotation and thus fall within the scope of the Opening Exemption. Because the Commission is proposing to incorporate the exemptive relief reflected in the Opening Exemption into the Rule with respect to market or limit orders received during regular trading hours, but believes it would be useful to include the NMLOs described above in Rule 605 reports, the Commission is also proposing to rescind the Opening Exemption.[236]

As a result of the proposed inclusion of limit orders submitted after closing and the proposed changes to the categorization of NMLOs described in section IV.B.2, limit orders could be received for execution and fall within the scope of Rule 605 on a day other than the day of order receipt. Under current Rule 605(a)(1), a reporter must prepare a monthly report on the covered orders in NMS stocks that it received for execution from any person. In order to address this scenario, the Commission proposes that a covered order would be required to be included in the report for the month in which it becomes executable if the day of receipt and the day it initially becomes executable occur in different calendar months. Therefore, the Commission proposes to amend Rule 605(a)(1) to require a market center, broker, or dealer to include in its monthly report, in addition to the covered orders in NMS stocks that it received for execution from any person, those covered orders in NMS stocks that it received for execution in a prior calendar month but which remained open.[237]

2. Stop Orders

The definition of ''covered order'' excludes orders with special handling instructions, including orders submitted with stop prices.[238] Therefore, orders submitted with stop prices are excluded from Rule 605 reports.

The Commission preliminarily understands that market centers and broker-dealers may differ in how they handle stop orders, and the current lack of consistent information regarding executions of such orders may prevent investors from comparing the execution quality of such orders. Further, stop orders are likely to hit their stop prices, and are often executed, during periods of price volatility or downwards market momentum, which may entail less than favorable execution conditions. Given the potential for variation across market centers and broker-dealers, as well as the market conditions under which stop orders may execute, the Commission believes including stop orders within the scope of the Rule would benefit market participants by allowing them to analyze these variations in execution quality. Further, as stated by the petitioner, including stop orders within the Rule's scope would provide a more complete view of the orders certain broker-dealers may use when assessing the execution quality market centers provide.[239]

Orders submitted with stop prices are often submitted well before their stop prices are reached. In order to provide an ''apples-to-apples'' comparison of stop orders, the Commission is proposing to measure the execution quality of orders submitted with stop prices from the time their stop prices are reached, *i.e.,* when such orders become executable. As part of the proposed definition of ''executable,'' the Commission is proposing to specify that executable means, for any buy order submitted with a stop price, that the stop price is equal to or greater than the national best bid during regular trading hours, and, for any sell orders submitted with a stop price, that the stop price is equal to or less than the national best offer during regular trading hours.[240] Incorporation of the ''executable'' concept would have two effects. First, stop orders would be reported as part of a Rule 605 report only if they become executable.[241] Second, the point that a stop order first becomes executable would be used as a benchmark for several execution quality metrics, including average effective spread, average effective over quoted spread, average realized spread, and average time to execution statistics.[242] The Commission is proposing to use the time an order becomes executable rather than the time of order receipt based on the understanding that customers, at least for purposes of evaluating execution quality of stop orders, would generally expect such orders to be executed close in time to when their stop prices are triggered. Including executable orders submitted with stop prices within the scope of the Rule would help investors compare the performance of market centers and broker-dealers from a point in time when such orders could reasonably be expected to execute. Accordingly, the Commission proposes to rescind the exclusion of orders submitted with stop prices within the definition of covered

[233] *See id.* (exemption from reporting under Rule 11Ac1–5, the predecessor to Rule 605). In addition to the Opening Exemption, the Market Systems Exemptive Letter included a separate exemption from the Rule for orders received during a time when the consolidated BBO reflects a spread that exceeds $1 plus 5% of the midpoint of the consolidated BBO (''Spread Width Exemption'').

[234] *See* proposed Rule 600(b)(30).

[235] *See id.*

[236] Because the Spread Width Exemption is not inconsistent with the proposed amendments to Rule 605, the Commission would not rescind the Spread Width Exemption. The Commission continues to believe that orders received during a time when the consolidated BBO reflects a spread that exceeds $1 plus 5% of the midpoint of the consolidated BBO ''could be the result of potentially erroneous quotes or of abnormal trading conditions'' and their inclusion ''could significantly affect the comparability and reliability of the execution quality measures in market center monthly reports.'' Market Systems Exemptive Letter at 2. The Commission may adopt an updated or modified exemption under Rule 605(b) to further refine the exemption if, for example, additional factors could be considered reliable indicators of orders that could be the result of erroneous quotes or abnormal trading conditions. *See* 17 CFR 242.605(b).

[237] *See* proposed Rule 605(a)(1).

[238] *See* 17 CFR 242.600(b)(22). Generally, a limit order submitted with a stop price becomes a market order when the stop price is reached. A stop order to buy becomes a market order when the security is bid or trades at or above the specified stop price; a stop order to sell becomes a market order when the security is offered or trades at or below the specified stop price.

[239] *See supra* note 123 and accompanying text.

[240] *See* proposed Rule 600(b)(42). *See also infra* note 303 and accompanying text (discussing the definition of ''executable'' as it relates to other non-marketable order types).

[241] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include a category for ''*executable* orders submitted with stop prices'') (emphasis added).

[242] For further discussion of these metrics, *see infra* sections IV.B.3, IV.B.4.(a), IV.B.4.(b), IV.B.4.(d), and IV.B.6.

order.[243] As proposed, these orders would comprise a separate order type category to help ensure comparability of execution quality statistics since, as stated above, stop orders more often may execute under volatile or downward-trending market conditions.[244]

3. Non-Exempt Short Sale Orders

Commission staff has taken the position that staff would view all short sale orders that are not marked ''short exempt'' (''non-exempt short sale orders'') as special handling orders and, in the staff's view, these orders may be excluded from the definition of ''covered order'' in Rule 600(b)(15).[245] Non-exempt short sale orders are subject to a price test under Rule 201 of Regulation SHO (''Rule 201'') that sets forth a short sale circuit breaker that is triggered in certain circumstances, after which time a price restriction will apply to short sale orders in that security for that day and the following day.[246] In 2013, Commission staff stated that because in certain circumstances non-exempt short sale orders are subject to a price test under Rule 201, and the circumstances could vary for different securities and different days throughout the month, staff would view *all* non-exempt short sale orders as subject to special handling.[247]

The Commission preliminarily believes that for purposes of this proposal, not all non-exempt short sale orders should be excluded from the scope of Rule 605 reporting. When a non-exempt short sale order is subject to a price test restriction under Rule 201 of Regulation SHO, a trade may only take place at least one tick above the national best bid.[248] These tick-sensitive orders could be ''orders to be executed only on a particular type of tick or bid,'' which is one of the types of special handling orders specified in the definition of covered order.[249] However, excluding *all* non-exempt short sale orders from Rule 605 reporting, regardless of whether or not a Rule 201 price test restriction is in effect, excludes a significant portion of short sale orders that are not tick-sensitive. Non-exempt short sale orders do not appear to be tick-sensitive the majority of the time because they are infrequently subject to a price test restriction. Analysis shows that, between April 2015 and March 2022, an event that triggered the Rule 201 circuit breaker only occurred on 1.7% of trading days for an average stock.[250] The analysis also found that around 18% of trigger events occurred the day after a previous trigger event, and around 46% of trigger events occurred within a week after a previous trigger event, implying that these trigger events tend to be relatively infrequent and clustered around a small number of isolated events. Moreover, because non-exempt short sale orders are not tick sensitive when a short sale price test is not in effect, the inclusion of these orders would not skew execution quality statistics.[251]

In addition, including non-exempt short sale orders for which a price test restriction is not in effect for the security within Rule 605 statistics would lead to a more complete picture of reporting entities' execution quality, because there is evidence that short sales compose a large segment of trades, and likely also order flow. Analysis of short volume data shows that, between August 2009 and February 2021, short selling constituted an average of 47.3% of trading volume for non-financial common stocks.[252] As discussed further below, evidence suggests that hedge funds make up the majority of the short selling market, while an academic working paper found that, between January 2010 and December 2016, around 10.92% of retail trading was made up of short sales.[253]

Therefore, under the proposal, non-exempt short sale orders would not be considered special handling orders unless a price test restriction is in effect for the security. Unless another exclusion applies, non-exempt short sale orders would fall within the definition of covered order and thus within the scope of Rule 605 reporting.[254] Conversely, during a short sale price test, a short sale order not marked ''exempt'' would be subject to special handling and would be excluded from the definition of covered order and thus from Rule 605 reporting.

Request for Comment

The Commission seeks comment generally on the proposed expansion of Rule 605 reporting requirements to include certain orders received outside of regular trading hours and orders submitted with stop prices, as well as the proposal to incorporate non-exempt short sale orders into Rule 605 unless a price test restriction is in effect for the security. In particular, the Commission solicits comment on the following:

15. Should the security's opening or re-opening price be required to be used as a benchmark to determine whether a limit order submitted outside of regular trading hours is marketable or non-marketable? If not, what would be an alternative benchmark? Please explain.

16. Should the definition of ''covered order'' include NMLOs submitted outside of regular trading hours or when the NBBO is not being disseminated (*i.e.,* limit orders that are not marketable based on the security's opening or re-opening price)? Should market orders and marketable limit orders submitted outside of regular trading hours or when the NBBO is not being disseminated be included within the definition of ''covered order''? Why or why not? Should these orders be grouped with other market or marketable limit orders or as new order type categories?

17. Do commenters agree that requiring orders submitted with stop prices to be included in Rule 605 reports, and segregating them into their own order type category, would avoid distorting execution quality statistics? If not, why not?

18. Do commenters agree that periods when a short sale price test is in effect are relatively infrequent and clustered around a small number of isolated events? Why or why not?

19. Should other types of orders be included within the scope of covered orders? For example, currently intermarket sweep orders (''ISOs'') with a limit price inferior to the NBBO may

[243] *See* proposed Rule 600(b)(30) (eliminating the express carve out of orders submitted with stop prices from the definition of ''covered order'').

[244] *See also infra* section IV.B.2.a below for more detailed description of the changes to categorization by order type, including a new category for executable orders with stop prices.

[245] 17 CFR 242.600(b)(15). *See* ''Responses to Frequently Asked Questions Concerning Rule 605 of Regulation NMS'' (Feb. 22, 2013) (''2013 FAQs'').

[246] 17 CFR 242.201. Rule 201 generally requires trading centers to establish, maintain, and enforce written policies and procedures that are reasonably designed to prevent the execution or display of a short sale at an impermissible price when a stock has triggered a circuit breaker by experiencing a price decline of at least ten percent in one day. Once the circuit breaker in Rule 201 has been triggered, the price test restriction will apply to short sale orders in that security for the remainder of the day and the following day, unless an exception applies. *See* 17 CFR 242.201(b)(1). One exception is for the execution or display of a short sale order marked ''short exempt.'' *See* 17 CFR 242.201(b)(1)(iii)(B); 17 CFR 242.201(c).

[247] *See* 2013 FAQs.

[248] *See* 17 CFR 242.201(b)(1)(i).

[249] *See* 17 CFR 242.600(b)(22).

[250] *See infra* note 662 and accompanying text.

[251] In adopting Rule 605, the Commission stated that the definition of covered order excludes orders (including short sales that must be executed on a particular tick or bid) for which the customer requested special handling for execution and that, if not excluded, would skew general statistical measures of execution quality. *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421.

[252] *See infra* note 820 and accompanying text.

[253] *See infra* notes 821–827 and accompanying text. *See also supra* note 123 and accompanying text (petitioner recommending inclusion of short sales in Rule 605).

[254] If an order is otherwise subject to special handling it would not be a covered order. *See* proposed Rule 600(b)(30).

be viewed to be subject to special handling and are excluded from Rule 605 reports. Should these or other orders types be included within the scope of covered orders? If so, please explain any additional requirements or conditions that would help ensure comparability of order execution quality statistics across reporting entities. For example, if a new order type should be within the scope of covered orders, should it be a new order type category or be added to an existing or proposed order type category (as described in part IV.B.2 below)?

B. Required Information

The categories in Rule 605 reports are intended to strike a balance between sufficient aggregation of orders to produce statistics that are meaningful on the one hand, and sufficient differentiation of orders to facilitate fair comparisons of execution quality across market centers on the other hand.[255] When adopting the Rule, the Commission stated that its experience with the categories prescribed by the Rule may indicate ways in which they could be improved in the future.[256]

1. Categorization by Order Size

Rule 600(b)(13) defines ''categorized by order size'' as dividing orders into separate categories based on the number of shares composing an order.[257] For the purposes of Rule 605 reports, the largest size category has been limited to include only orders greater than 5,000 shares and less than 10,000 shares.[258] The Commission proposes to amend the definition of ''categorized by order size'' to provide the following categories for order sizes: (i) less than 1 share; (ii) odd-lot; (iii) 1 round lot to less than 5 round lots; (iv) 5 round lots to less than 20 round lots; (v) 20 round lots to less than 50 round lots; (vi) 50 round lots to less than 100 round lots; and (vii) 100 round lots or greater.[259]

The reasons for these changes are discussed below.

(a) Round Lot Multiple Characterization

Currently, Rule 605 reports utilize order size categories based on the numbers of shares in the order (*e.g.,* 100–499 shares and 500–1,999 shares). Historically, round lots generally have been viewed as groups of 100 shares, and current Rule 605 reflects this.

In recent years, the prices of some of the most widely held stocks have increased significantly,[260] and differences in price affect how stocks trade. For example, a 100-share order of a $1,200 stock would likely have very different execution quality statistics than a 100-share order of a $10 stock because more capital is at risk in the former. But under current Rule 605, these orders are reported in the same order size category.

Further, many of Rule 605's execution quality measures rely on the NBBO as a benchmark.[261] In adopting the Market Data Infrastructure rules (the ''MDI Rules''), the Commission stated that the new definition of round lot will improve certain Rule 605 statistics. The Commission stated that the definition of round lot would allow additional orders of meaningful size to determine the NBBO, and, therefore, the execution quality and price improvement statistics required under Rule 605 would be based upon an NBBO that the Commission believes is a more meaningful benchmark for these statistics.[262] As a result of the new round lot definition,[263] the NBBO in higher-priced NMS stocks is based on smaller, potentially better-priced orders.[264] The newly adopted definition of round lot is tiered based on the NMS stock's prior month closing price.[265] Upon implementation, the NBBO will be calculated based on the new definition of round lot.[266]

The Commission proposes to modify the order size categories to utilize the new definition of round lot and include odd-lots, fractional shares, and larger order sizes. Because the new definition of round lot incorporates the current market price of the security, the Commission believes that notional buckets and caps suggested by commenters are not necessary.[267] The proposed order size categories would correspond to the existing share-based order size categories to reflect that round lots historically had been viewed as groups of 100 shares. For example, the category for 100 to 499 shares would instead be 1 round lot to less than 5 round lots. Because the current exemptive relief[268] effectively caps the existing order size category of 5,000 or more shares to 9,999 shares, the second largest order size category would be 50 round lots to less than 100 round lots. The Commission is also proposing to add new order size categories for odd-lots, fractional shares, and larger-sized orders as discussed below.[269]

Additionally, modifying the order size categories to reflect the number of round lots would better allow Rule 605 reports to group orders with similar characteristics and notional values, and thereby provide more useful execution quality information. In particular, with the NBBO to be calculated based on the new definition of round lot, updating the order size categories to be based on round lots should allow for better comparisons of statistics that rely on the NBBO as a benchmark, including price improvement statistics. The NBBO is used as a benchmark throughout Rule 605 to determine marketability of orders, effective and realized spread, and price improvement/dis-improvement statistics. If the order size category were not based on the round lot size for that stock, Rule 605 statistics

[255] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75423.

[256] *See id.*

[257] 17 CFR 242.600(b)(13). *See supra* note 40.

[258] *See infra* note 281 and accompanying text.

[259] *See* proposed Rule 600(b)(19).

[260] *See supra* note 16.

[261] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421 (stating that nearly all of the statistical measures included in the Rule depend on the availability of a consolidated BBO at the time of order receipt).

[262] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18621.

[263] Specifically, the Commission re-defined ''round lot'' as: 100 shares for stocks priced at $250 or less, 40 shares for stocks priced at $250.01 to $1,000, ten shares for stocks priced at $1,000.01 to $10,000, and one share for stocks priced at $10,000.01 or more. *See* 17 CFR 242.600(b)(82).

[264] As described in the MDI Adopting Release, orders currently defined as odd-lots often reflect superior pricing. *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18616 (describing analysis that made similar findings using data from May of 2020). A recent working paper analyzed the effect of the new round lot definition and found that for sample stocks in the 40-share round lot category the incidence of better-priced odd-lot quotes fell by approximately 4.8% and for sample stocks in the 10-share round lot category the incidence fell by approximately 22%. *See* Bartlett, et al. at 5.

[265] The round lot definition, together with the increased availability of better priced odd-lot information, was designed to provide investors with valuable information about the best prices available and help to facilitate more informed order routing decisions and the best execution of investor orders. *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18602.

[266] *See id.* The Commission is separately proposing to accelerate the implementation of the round lot definition. *See* Securities Exchange Act Release No. 96494 (Dec. 14, 2022) (File No. S7–30–22) (Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders) (''Minimum Pricing Increments Proposal''). The Commission established a phased transition plan for the implementation of the MDI Rules, which provided for the implementation of the round lot definition as part of the final phase of implementation. *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18698–18701. At a minimum, round lot implementation will be two years after the Commission's approval of the plan amendment(s) required by Rule 614(e). Until the round lot definition adopted pursuant to the MDI Rules is implemented, round lots continue to be defined in exchange rules. *See id.* at 16738. For most NMS stocks, a round lot is defined as 100 shares. According to TAQ Data, as of April 2022, eleven stocks had a round lot size other than 100. Nine stocks had a round lot of ten and two stocks had a round lot of one.

[267] *See supra* notes 128–132 and accompanying text.

[268] *See* Large Order Exemptive Letter.

[269] *See infra* section IV.B.1.(b)(1) and (2). The largest order size category would be 100 round lots or more. *See* proposed Rule 600(b)(19)(vii).

would show, for example, larger amounts of price improvement for high-priced stocks based on the presumably wider NBBO. However, the statistics would still be comparable across market centers and broker-dealers since they would all be utilizing the same benchmark.

(b) New Sizes Within Scope

(1) Odd-Lots and Orders Less Than a Share

Currently, Rule 605 does not require reporting for orders smaller than 100 shares, including odd-lot orders or fractional share orders (*i.e.,* orders for less than one share).[270] Commenters suggested amending the scope of the Rule to include odd-lot orders.[271] One commenter offering suggestions regarding enhancements to Rule 605 and Rule 606 from a retail perspective stated that, while ''odd lots may not represent a high percentage of executed share volume, they do represent a high percentage of incoming executed order volume.''[272] Market participants stated that odd-lots make up a majority of all trades.[273] Particularly as stock prices have risen,[274] odd-lots have come to represent an increased percentage of orders.[275] Analysis using TAQ data found that odd-lots increased from around 15% of trades in January 2014 to more than 55% of trades in March 2022.[276] An analysis of data from the SEC's MIDAS analytics tool shows that, in Q1 2022, odd-lots made up 81.2% of on-exchange trades (40% of volume) for stocks in the highest price decile and 25% of on-exchange trades (2.72% of volume) for stocks in the lowest price decile.[277] Based on changes the Commission has observed in the market, the observations of commenters and other market participants, as well as its analysis, the Commission preliminarily believes the exclusion of order sizes smaller than 100 shares excludes an important segment of order flow. Therefore, the Commission is proposing a new order size category for odd-lots.

Similarly, fractional share orders have become increasingly popular with individual investors as certain stock prices have risen and certain broker-dealers have made fractional shares available to their customers.[278] Analysis of CAT data from March 2022 found that executed orders with a fractional share component originated from over 5 million unique accounts. Orders for less than a single share represent a significant portion of fractional orders executions.[279] In order to capture execution quality information for these orders, the Commission is proposing a new size category for orders less than a share. To the extent an order with a fractional share component is for more than a single share, it would not be included in this size category to help ensure comparability of order execution quality statistics.[280]

(2) Larger-Sized Orders

Currently, Rule 605 does not require reports that include orders with a size of 10,000 shares or greater pursuant to exemptive relief provided by the Commission in 2001.[281] In granting the exemption, the Commission stated that a primary objective of the Rule is to ''generate statistical measures of execution quality that provide a fair and useful basis for comparisons among different market centers,'' and reasoned that the exclusion of such orders would help assure greater comparability of statistics in the largest size category of 5,000 or more shares.[282]

Commenters have advocated for the Commission to include larger-sized orders in Rule 605 reports. One commenter responding to the 2018 Rule 606 Amendments stated that the exclusion of certain types of marketable limit orders, including those of 10,000 shares or more, undermines the utility of Rule 605 reports.[283] The entity that petitioned for rulemaking in this area stated that because of the variation in stock prices (*e.g.,* a 5,000 share order with a notional value of $17.3 million and a 5,000 share order with a notional value of $76,000), categorizing orders by share size is no longer effective.[284] The petitioner recommended the Commission include both odd-lots and orders of 10,000 or more shares, and add notional size categories to the metrics, with a notional cap.[285]

The Commission proposes to rescind the exemptive relief for orders of 10,000 or more shares and include these orders within the scope of Rule 605 reports. The Commission believes that including such larger-sized orders would improve execution quality statistics in Rule 605 reports by including information about an important segment of order flow. Analysis of TAQ data shows that the number of shares associated with trades that were for 10,000 or more shares as a percent of total executed shares was 11.3% in March 2022.[286] In addition, analysis of the distribution of NMLO sizes in order submission data from MIDAS for the month of March 2022, shows that, while NMLOs of 10,000 or more shares made up only 0.09% of order flow in terms of number of orders, they made up nearly 7.8% of order flow in terms of share volume.[287] Although

[270] There are a variety of circumstances in which an order for an NMS stock submitted to a broker-dealer results in a fractional share. Examples include customer orders to buy: (1) a fraction of a share (*e.g.,* order to buy 0.5 shares); (2) shares with a fractional component (*e.g.,* order to buy 10.5 shares); and (3) a dollar amount that leads to the purchase of a fractional share (*e.g.,* order to buy $1,223 worth of XYZ stock at $50 per share or 24.46 shares).

[271] *See* Healthy Markets IV (discussing recommended reforms to Rule 605 and Rule 606) at 3; IHS Markit Letter (responding to the 2018 Rule 606 Amendments) at 5, text accompanying n.15; EMSAC III (recommendations regarding modifications to Rule 605 and Rule 606) at 2.

[272] FIF I at 1. The commenter also stated that retail investors account for a notable portion of odd-lot trades. *See* FIF I at 1. Later, the commenter stated that odd-lots represent close to 50% of self-directed orders. *See* FIF III at 4.

[273] *See* ''Effective Spreads, Payment for Order Flow, and Price Improvement'', RBC Capital Markets (Mar. 2022) at 5. *Cf.,* Virtu Petition at 4, n.13 and accompanying text (odd-lots make up 70% of all trades in high priced stocks).

[274] *See supra* note 16.

[275] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18616 (describing analyses confirming observations made in the MDI Proposing Release that a significant proportion of quotation and trading activity occurs in odd-lots, particularly for frequently traded, high-priced stocks).

[276] *See supra* note 91.

[277] *See* dataset ''Summary Metrics by Decile and Quartile'' *available at https://www.sec.gov/marketstructure/downloads.html.*

[278] *See infra* note 642. Orders with a fractional share component may be executed in a number of ways: a broker-dealer may (i) internalize the entire order as principal using its own inventory; (ii) create a representative order that rounds up the order to the nearest whole number using its own inventory and route it for execution, then fill the original customer's fractional order after the representative order is executed; (iii) internalize the fractional component of the order (*e.g.,* 0.5 shares) and send the whole share component (*e.g.,* 2 shares) away for execution; or (iv) aggregate different fractional orders to make one large representative order and then route it for execution, and fill the original fractional orders post-execution.

[279] Analysis of CAT data from March 2022 found that almost 68% percent (31.67 million) of the 46.63 million executed orders with a fractional component were for less than a single share. *See infra* note 644 and accompanying text.

[280] For example, a covered order for 10.5 shares in a security with a 100-share round lot would be categorized as an odd-lot. *See* proposed Rule 600(b)(19).

[281] *See* Large Order Exemptive Letter.

[282] *Id.* at 2.

[283] *See* IHS Markit Letter at 34. *See also* KOR Group I at 4 (responding to the Commission's Concept Release on Equity Market Structure, suggesting elimination of a share size cap on Rule 605 reporting).

[284] *See* Virtu Petition at 4–5.

[285] *See id.* at 5.

[286] *See infra* note 649 and accompanying text. The percentage of larger-sized trades has fluctuated over time, in part due to broker-dealers' use of Smart Order Routers (''SORs'') to break up their institutional investor customers' large parent orders into smaller-sized child orders along with other market changes, such as the overall increase in stock prices. The rate of larger-sized trades has declined from a rate of more than 25% in late 2003, but has increased from 6.7% in August 2011. *See id.*

[287] *See infra* Figure 4. While larger-sized orders comprise a non-negligible percent of order flow,

the Commission had concerns about the comparability of execution quality statistics for larger-sized orders when adopting the Rule, the Commission expects that the proposed inclusion of two additional categories for larger order sizes [288] (*i.e.,* corresponding to 5,000–9,999 shares and 10,000 or more shares in the case of a 100 share round lot) would allow for better comparability of statistics. The proposed amended definition of ''categorized by order size'' that aligns with the new definition of round lot would enhance such comparability.

Request for Comment

The Commission seeks comment on the proposed changes to the definition of ''categorized by order size.'' In particular, the Commission solicits comment on the following:

20. Should fractional share orders be required to be included in Rule 605 reports? Why or why not?

21. Should odd-lot orders be required to be included in Rule 605 reports? Why or why not?

22. Should orders of 10,000 or more shares be required to be included in Rule 605 reports? Why or why not? Do commenters believe that including such orders would skew the statistics for the largest order size category? Would commenters support one or more notional caps for share size buckets (such as 10,000 shares or greater), and if so, why? Please explain and provide data.

23. Do commenters agree with the proposed modification of order size categories? If not, why not? Would categories based on number of shares—or the following categories based exclusively on notional value: $1 to less than $10,000.00, $10,000.01 to less than $25,000.00, $25,000 to less than $100,000, and over $100,000—be more useful, less burdensome, or more cost-effective as either a permanent or an alternative measure until such time as the new definition of round lot has been implemented? Do commenters recommend different size or notional value categories? If so, please describe such categories.

2. Categorization by Order Type

Under Rule 605(a)(1), monthly reports are categorized by order type. Currently, ''categorized by order type'' means dividing orders into separate categories for market orders, marketable limit orders, inside-the-quote limit orders, at-the-quote limit orders, and near-the-quote limit orders.[289] As discussed below, the Commission proposes to modify this definition to mean dividing orders into separate categories for market orders, marketable limit orders (excluding immediate-or-cancel orders), marketable immediate-or-cancel orders, beyond-the-midpoint limit orders, executable non-marketable limit orders (excluding beyond-the midpoint limit orders and orders submitted with stop prices), and executable orders submitted with stop prices.[290] The following compares the order type categories under the current Rule to the proposed new order type categories:

Existing order type category	Order type category as proposed
Market	Market, Marketable IOC.
Marketable Limit	Marketable Limit, Marketable IOC.
Inside-the-Quote Limit	Beyond-the-Midpoint Limit, Executable NMLO.
At-the-Quote Limit	Executable NMLO.
Near-the-Quote Limit	Executable NMLO.[291]
[Not Included][292]	Executable NMLO, Executable Stop.

The Commission believes that the proposed categories will improve execution quality information within Rule 605 reports and better group comparable orders.

(a) NMLOs and Orders Submitted With Stop Prices

The Commission proposes to eliminate the three separate categories for types of NMLOs (*i.e.,* inside-the-quote limit orders, at-the-quote limit orders, and near-the-quote limit orders) and to replace them with new categories: non-marketable limit orders that become executable (excluding orders submitted with stop prices and beyond-the-midpoint limit orders) and beyond-the-midpoint limit orders.[293] Current Rule 605 reports group NMLOs as inside-the-quote, at-the-quote, and near-the-quote, and exclude NMLOs that are more than ten cents away from the quote at the time of order receipt.[294] When proposing to exclude NMLOs with a limit price more than ten cents away from the NBBO, the Commission reasoned that the execution quality statistics for these types of orders may be less meaningful because executions of these types of orders depend more on the order's limit price and price movement in the market than on handling by the market center.[295]

Commenters supported including NMLOs further away from the quote in

some or possibly most of these large orders may be not held to the market, in which case they would not be included in Rule 605 reports even without the exemptive relief.

[288] *See supra* text following note 267, notes 268–269 and accompanying text. The two largest buckets in proposed Rule 600(b)(19)(vi) and (vii) group together orders of between 50 round lots to less than 100 round lots and orders of 100 round lots or greater, respectively.

[289] *See* 17 CFR 242.600(b)(14). The Commission is proposing to renumber the definition of ''categorized by order type'' as proposed Rule 600(b)(20).

[290] *See* proposed Rule 600(b)(20). Market orders and marketable limit orders are existing categories under the current definition of ''categorized by order type.'' *See* 17 CFR 242.600(b)(14).

[291] Under the proposal, near-the-quote limit orders would fall outside the scope of the order type categories if they do not become executable. *See infra* section IV.B.2.(a) for discussion of the definition of executable.

[292] The following orders fall outside the scope of the current order type categories: (1) non-marketable buy orders and non-marketable sell orders with limit prices that are more than $0.10 lower than the national best bid or higher than the national best offer, respectively, at the time of order receipt; and (2) stop orders. Under the proposal, such orders, if they become executable, would fall within the order types for executable NMLOs or executable stop orders. However, these orders would fall outside the scope of the order type categories as proposed if they do not become executable.

[293] *See supra* text accompanying note 290. Beyond-the-midpoint limit orders, discussed in more detail in section IV.B.2.(b) *infra,* are a type of NMLO that is priced more aggressively than the midpoint.

[294] *See* 17 CFR 242.600(b)(14). Inside-the-quote limit order, at-the-quote limit order, and near-the-quote limit order mean non-marketable buy orders with limit prices that are, respectively, higher than, equal to, and lower by $0.10 or less than the national best bid at the time of order receipt, and non-marketable sell orders with limit prices that are, respectively, lower than, equal to, and higher by $0.10 or less than the national best offer at the time of order receipt. *See* 17 CFR 242.600(b)(37). The Commission is proposing to eliminate this definition of inside-the-quote limit order, at-the-quote limit order, and near-the-quote limit order. These defined terms would no longer be used with the changes to order type categories proposed herein. The proposed new order type categories for NMLOs would focus on whether a NMLO becomes executable rather than on how a NMLO's limit price compares to the quote, as discussed further below.

[295] *See* Proposing Release, 65 FR 48406 (Aug. 8, 2000) at 48414.

Rule 605 reports but noted the difficulty of providing meaningful execution quality statistics for such orders. One commenter to the 2018 Rule 606 Amendments observed: ''With non-marketable limit orders, what matters is the skill of the broker in choosing the venue with the highest probability of filling the order. Measuring execution quality is difficult in that some limit orders are placed far away from the NBBO and are unlikely to be filled. Others are cancelled after varying lengths of time for any number of reasons. It may be difficult to tell whether a cancelled order would have been filled later had it not been cancelled.'' [296] In offering suggestions to modernize Rule 605, another commenter recommended including an additional ''away-from-the-quote'' bucket for NMLOs, which the commenter stated would capture a significantly greater number of self-directed orders from individual investors.[297]

The Commission recognizes that more meaningful measures of execution quality for NMLOs, as well as orders submitted with stop prices,[298] would assist investors in measuring execution quality. A large number of NMLOs are not captured because they are more than ten cents away from the NBBO or submitted outside of regular market hours.[299] The Commission believes that it would be informative to calculate execution quality statistics for those NMLOs and orders submitted with a stop price that become ''executable.'' [300] Because execution quality for orders placed further away from the quote depends heavily on prevailing market conditions,[301] adding the concept of ''executable'' allows execution quality statistics to be measured from a point where an order could be executed.[302]

As proposed, Rule 605 statistics would be collected for ''executable'' NMLOs. The Commission proposes the following definition of ''executable'' for NMLOs (other than orders submitted with stop prices): for any non-marketable buy order (excluding orders submitted with stop prices), executable means that the limit price is equal to or greater than the national best bid during regular trading hours, and, for any non-marketable sell order (excluding orders submitted with stop prices), that the limit price is equal to or less than the national best offer during regular trading hours.[303] This definition is designed to capture NMLOs (including beyond-the-midpoint limit orders) that, during their time in force, ''touched'' a price where they could have been executed. For example, if the market is $10.05 × $10.10, a limit order to buy at $10.02 would not be an executable NMLO unless the market moved to a price at which that limit order could be executed—for example, $10.02 × $10.06. As is the case for orders submitted with stop prices, incorporation of the ''executable'' concept would have two effects. First, NMLOs would only be reported as part of a Rule 605 report if they become executable during regular trading hours.[304] Because there are substantial differences in the nature of the market between regular trading hours and after-hours, this would provide a basis for more comparable execution quality measures. Second, the point that a NMLO first becomes executable would be used as an input for several execution quality metrics: average time to execution statistics,[305] average effective spread,[306] average percentage effective and realized spread,[307] and average effective over quoted spread.[308] The Commission is proposing to use the time an order first becomes executable rather than the time of order receipt in order to measure execution quality from a point in time when a liquidity-providing order is priced at or better than the quote. Including executable NMLOs within the scope of the Rule would help investors compare the performance of market centers and broker-dealers from a point in time when such orders could reasonably be expected to execute and provides a more informative measure of execution quality by controlling for market conditions.

(b) Beyond-the-Midpoint Limit Orders

Under current Rule 605, inside-the-quote limit orders are a separate order type category.[309] Because they are not a marketable order type (*i.e.,* they do not fully cross the spread),[310] current Rule 605 does not require price improvement statistics to be calculated for inside-the-quote limit orders.[311]

Limit orders priced more aggressively than the midpoint may have different execution quality statistics than other types of NMLOs because market centers and broker-dealers may treat beyond-the-midpoint limit orders as marketable limit orders in certain circumstances and as NMLOs in others. An analysis of a sample of orders executed by the six most active wholesalers for the period of Q1 2022 [312] shows that beyond-the-midpoint NMLOs executed by wholesalers tend to have much faster time-to-executions and higher fill rates than other types of inside-the-quote NMLOs, and are also somewhat more likely to be given price improvement, indicating wholesalers often treat limit orders priced more aggressively than the midpoint more like marketable limit orders and may offer price improvement to these orders.[313]

The Commission is proposing to label those limit orders priced more aggressively than the midpoint as ''beyond-the-midpoint limit orders.'' Because beyond-the-midpoint limit orders are a type of NMLO and could therefore be covered orders even if received outside of regular trading hours

[296] Angel Letter at 7. *See also* Blackrock Letter at 3 (stating in response to the Commission's Concept Release on Equity Market Structure that revised Rule 605 disclosures should provide greater transparency on NMLOs).

[297] *See* FIF III at 4.

[298] *See supra* section IV.A.2.

[299] An analysis of 80 stocks in March 2022 finds that away-from-the-quote orders (*i.e.,* NMLOs that are more than $0.10 away from the NBBO) represent 23.8% of non-marketable share volume). *See infra* section VII.C.2.(c)(1).

[300] As discussed above, the Commission is proposing to modify the definition of ''covered order'' to include NMLOs submitted outside of regular trading hours or when an NBBO is not being disseminated and orders submitted with a stop price. *See supra* sections IV.A.1 and IV.A.2.

[301] For example, even if a limit order is placed $0.05 away from the quote, if the market moves away and only 25 minutes later returns to a price level where the limit order executes, the time to execution for that order is less reflective of execution quality than of prevailing market conditions.

[302] As discussed above (*see supra* section IV.A.2.), the Commission also believes it would be helpful to investors to measure the execution quality of orders submitted with stop prices. Therefore, it is proposing to add a separate order type category of ''executable orders submitted with stop prices'' to the definition of ''categorized by order type.'' *See* proposed Rule 600(b)(20).

[303] *See* proposed Rule 600(b)(42). *See also supra* note 240 and accompanying text (discussing the definition of ''executable'' as it relates to orders submitted with stop prices).

[304] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include a category for ''*executable* non-marketable limit orders'') (emphasis added).

[305] *See infra* section IV.B.3.

[306] *See infra* section IV.B.4.(b).

[307] *See infra* section IV.B.4.(c).

[308] *See infra* section IV.B.4.(d).

[309] *See* 17 CFR 242.600(b)(14).

[310] *Cf. id.* (marketable limit orders separated from inside-the-quote limit orders).

[311] Rule 605(a)(1)(i) specifies execution quality statistics to be provided for all order types, and Rule 605(a)(1)(ii) specifies execution quality statistics to be provided for marketable order types. *See* 17 CFR 242.605(a)(1)(i) and (ii). For a discussion of the changes that the Commission is proposing to make to the execution quality statistics to be provided for all order types and for marketable order types, *see infra* sections IV.B.4 and IV.B.5, respectively. The Commission is also proposing to require additional execution quality statistics to be provided for non-marketable order types. *See infra* section IV.B.6.

[312] *See infra* note 689 and accompanying text; Table 5.

[313] *See infra* section VII.C.2.(c)(3).

or during a time when the NBBO is not being disseminated, the Commission is proposing to define a beyond-the-midpoint limit order with respect to orders received both when an NBBO is being disseminated and when it is not. If the NBBO is being disseminated, ''beyond-the-midpoint limit order'' would mean: (i) any non-marketable buy order with a limit price that is higher than the midpoint of the national best bid and national best offer at the time of order receipt, or (ii) any non-marketable sell order with a limit price that is lower than the midpoint of the national best bid and national best offer at the time of order receipt.[314] If the NBBO is not being disseminated, it would mean: (i) any non-marketable buy order with a limit price that is higher than the midpoint of the national best bid and national best offer at the time that the national best bid and national best offer is first disseminated after the time of order receipt, or (ii) any non-marketable sell order with a limit price that is lower than the midpoint of the national best bid and national best offer at the time that the national best bid and national best offer is first disseminated after the time of order receipt.[315]

In addition, the Commission proposes to require that the execution quality statistics for beyond-the-midpoint limit orders include the additional information required of both marketable[316] and non-marketable[317] order types. If beyond-the-midpoint orders instead were treated solely as a non-marketable order type, similar to inside-the-quote limit orders, then market centers and broker-dealers would not be required to provide the types of execution quality statistics specific to marketable orders for these orders. Because beyond-the-midpoint limit orders may participate in the proposed qualified auctions[318] or be treated as marketable orders in certain circumstances, it would be informative if reporting entities provided these types of statistics for these orders, especially given the increased likelihood that these types of orders may receive price improvement in certain circumstances.[319] However, because beyond-the-midpoint limit orders may execute more like inside-the-quote limit orders in other circumstances, the additional statistics required for the non-marketable order types would also be required to be reported for beyond-the-midpoint limit orders. This would facilitate comparisons of beyond-the-midpoint limit orders with other types of NMLOs. Therefore, the Commission proposes to add beyond-the-midpoint limit orders to both the list of marketable order categories and the list of non-marketable order categories for which those execution quality statistics are required, as provided in proposed Rules 605(a)(1)(ii) and 605(a)(1)(iii), respectively.

Unlike market, marketable limit, and marketable IOC orders, beyond-the-midpoint limit orders may be covered orders even if received outside of regular trading hours or when an NBBO is not being disseminated.[320] However, because beyond-the-midpoint limit orders are priced more aggressively than the midpoint of the NBBO when received, they are by definition executable from the time of order receipt unless submitted prior to market open or during a trading halt. In that case, they would be executable at the time the NBBO is first disseminated after the time of order receipt during regular trading hours. Therefore, the Commission proposes to modify the time to order execution statistics to state, with respect to beyond-the-midpoint limit orders, these time-based statistics should be measured from the time such orders become executable to the time of order execution.[321]

(c) Marketable IOCs

Rule 605 reports group marketable IOCs together with other marketable orders.[322] The Commission included IOC orders in the scope of the Rule, reasoning that IOC orders are functionally the same as orders that are submitted and cancelled almost immediately thereafter.[323]

The EMSAC, as well as commenters on the 2010 Equity Market Structure Concept Release and the 2018 Rule 606 Amendments, suggested separating IOCs within the categorization by order type.[324] While the Commission continues to believe that information regarding IOCs is useful to measure execution quality, marketable IOCs may have a different submitter profile (typically, institutional investors)[325] and different execution quality characteristics.[326] Analysis of Tick Size Pilot data indicates that IOCs typically have much lower fill rates than other market and marketable limit orders (on average 3.22% as compared to 15.94%), particularly with respect to larger-sized orders and orders received by wholesalers.[327] This data also shows that IOCs make up more than 90% of executed market and marketable share volume.[328] As a result, including them with other market and marketable limit orders may be skewing fill rates downwards, especially for larger-sized orders and orders handled by wholesalers.

To address this issue, the Commission proposes to assign marketable IOCs to a separate order type category so that they no longer would be commingled with other order types. Specifically, the Commission proposes to add a category for ''marketable immediate-or-cancel orders'' and indicate that the category for ''marketable limit orders'' excludes IOC orders.[329] Rule 605(a)(1)(i) and (ii) specify execution quality statistics required for enumerated categories of orders, including marketable limit orders. The Commission proposes to add marketable immediate-or-cancel orders to the enumerated order categories for those sets of execution quality statistics so that the Rule would continue to require the same information for marketable IOCs that is

[314] *See* proposed Rule 600(b)(16). *See also* proposed Rule 600(b)(20) (modifying the definition of ''categorization by order type'' to add beyond-the-midpoint limit orders to the list of order types).

[315] *See* proposed Rule 600(b)(16).

[316] *See* proposed Rule 605(a)(1)(ii) (specifying additional required information for market orders, marketable limit orders, marketable immediate-or-cancel orders, and beyond-the-midpoint limit orders).

[317] *See* proposed Rule 605(a)(1)(iii) (specifying additional required information for beyond-the-midpoint limit orders, executable non-marketable limit orders, and executable orders with stop prices).

[318] *See supra* section III.B.

[319] *See infra* note 689 and accompanying text; Table 5.

[320] The time-based execution quality statistics that would be required for marketable order types other than beyond-the-midpoint limit orders would be measured from the time of order receipt to the time of order execution. *See* proposed Rule 605(a)(1)(ii)(C), (D), (E), (G), (H), (I), (L), (M), and (N).

[321] *See* proposed Rule 605(a)(1)(ii)(C), (D), (E), (G), (H), (I), (L), (M), and (N).

[322] Rule 600(b)(14) defines ''categorized by order type'' and includes ''marketable limit orders'' within the listed categories of order types. *See* 17 CFR 242.600(b)(14).

[323] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75421.

[324] *See* IHS Markit Letter at 11; EMSAC III at 2; FIF I at 2.

[325] Analysis of CAT data of retail orders received at broker-dealers with 10,000 or more individual accounts during June 2021 indicates that approximately only 0.02% of retail orders are submitted with an IOC instruction. *See infra* note 722 and accompanying text.

[326] In offering recommendations to modernize Rule 605, a commenter who supported separating IOC orders within Rule 605 statistics stated that such orders have a different profile and can skew statistics. *See* FIF III at 5.

[327] *See infra* note 723 and accompanying text; Table 6. This analysis shows that wholesaler fill rates range between 60% to 90% for non-IOC orders, but are mostly below 30% for IOC orders, and even smaller with respect to larger order sizes. *See id.*

[328] *See infra* note 723 and accompanying text; Table 6.

[329] *See* proposed Rule 600(b)(20).

required for other marketable order types.[330]

Request for Comments

The Commission seeks comment on the proposed changes to the definition of ''categorized by order type.'' In particular, the Commission solicits comment on the following:

24. Should the proposed concept of executability be required to be used as a benchmark for NMLO and stop order statistics? Why or why not? Is another benchmark more appropriate, and if so why? Please explain and provide data, if available.

25. Should beyond-the-midpoint limit orders have different execution quality statistics than other types of NMLOs or marketable limit orders? Why or why not?

26. Should marketable IOCs be required to be broken out into a separate order type category? Why or why not? Do commenters agree that marketable IOCs may have a different submitter profile and different execution quality characteristics than market orders and marketable limit orders? Please explain.

3. Timestamp Conventions

Rule 605 reports are required to include information on the number of shares of covered orders executed within certain timeframes, measured by seconds after the time of order receipt.[331] Rule 600 definitions for ''time of order execution'' and ''time of order receipt'' require that time be measured ''to the second.'' [332] Further, the smallest time-to-execution category in current Rule 605 includes those covered orders executed from 0 to 9 seconds after the time of order receipt. The Commission proposes to update the timestamp conventions used for the time of order receipt [333] and time of order execution [334] definitions to require that such times be measured ''in increments of a millisecond or finer.'' The Commission also is proposing to specify that the average time-to-execution statistics currently required for marketable order types should be expressed in increments of a millisecond or finer.[335] Similarly, the proposed definition of ''executable'' provides that the time an order becomes executable ''shall be measured in increments of a millisecond or finer.'' [336] The equities markets now operate at much greater speeds than they did in 2000 when timestamps were adopted with second granularity. For example, an analysis of data from the SEC's MIDAS analytics tool shows that in Q1 2022 more than half (51.6%) of on-exchange NMLOs executed in less than one second in large market cap stocks.[337] Changes in technology have made more granular timestamp information more cost effective and practicable and timestamp information ''in increments of a millisecond or finer'' would result in more informative reports.

Numerous commenters have raised concerns about the Rule's timestamp conventions, especially given the increases in the speed of the market.[338] One commenter stated that current time bucketing is outdated and the Rule should provide average execution time for marketable orders, measured in milliseconds (or microseconds).[339] Another commenter suggested that Rule 605 should be re-written to include statistics at a granular number of milliseconds from order receipt time to either fill or cancel time.[340]

The proposed amendments would not require the use of reporting increments finer than milliseconds for reports generated under Rule 605. The CAT NMS Plan requires CAT reporters to report CAT data to the CAT in milliseconds and, to the extent a CAT reporter's order handling or execution systems utilize timestamps in increments finer than milliseconds, such CAT reporter is required to utilize such finer increments up to nanoseconds when reporting CAT data to the CAT.[341] CAT requires the use of such finer increments, when available, to assist in the accurate sequencing of reportable events on an order-by-order basis.[342] In contrast, the order and execution quality statistics under Rule 605 utilizing timestamp information are reported in the aggregate. Timestamp information in millisecond increments would allow for meaningful points of comparison between market centers or broker-dealers for both aggregate data that utilizes timestamp information and time-to-execution statistics such as average time to execution. There would be limited additional utility in requiring Rule 605 reporting using increments finer than a millisecond.

In conjunction with the proposed requirement to use the more granular timestamps, the Commission is proposing to eliminate the current time-to-execution buckets.[343] Average time to execution is already required to be reported for market orders and marketable limit orders,[344] and generally provides a more informative metric for those order types than the existing time-to-execution buckets given the speed with which those order types typically execute. The vast majority of market orders and marketable limit orders that execute are executed in less than a second,[345] an increment that results in almost all market and marketable limit orders being contained in the smallest of the existing time-to-execution buckets.[346] As a result, the existing time-to-execution buckets do not generally provide meaningful time-to-execution differentiation for market orders and marketable limit orders. The existing time-to-execution buckets only generally provide meaningful information for non-marketable order

[330] *See* proposed Rule 605(a)(i) and (ii). Additional information that is currently calculated for market and marketable limit orders (*e.g.,* price improvement statistics) would continue to be calculated for marketable IOCs.

[331] *See* 17 CFR 242.605(a)(1)(i)(F)–(J).

[332] *See* 17 CFR 242.600(b)(91) and (92). The Commission is proposing to renumber the definitions of ''time of order execution'' and ''time of order receipt'' as proposed Rule 600(b)(108) and (109), respectively.

[333] *See* proposed Rule 600(b)(109).

[334] *See* proposed Rule 600(b)(108).

[335] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, *see* proposed Rules 605(a)(1)(ii)(C), 605(a)(1)(ii)(G), and 605(a)(1)(ii)(L). Current Rule 605 does not specify a level of granularity for the existing time-to-execution statistics. However, the Plan requires these fields to be expressed in number of seconds and carried out to one decimal place. *See* Rule 605 NMS Plan section VI.a(21), (23), and (26).

[336] Proposed Rule 600(b)(42). As discussed above, the Commission is also proposing to expand the scope of Rule 605 reporting to include certain NMLOs submitted outside of regular trading hours, specifically NMLOs that become executable during regular trading hours. *See supra* section IV.A.1.

[337] *See* dataset ''Conditional Cancel and Trade Distribution'' *available at https://www.sec.gov/marketstructure/downloads.html. See also infra* note 692 and accompanying text.

[338] *See, e.g.,* KOR Group I at 2, FIF I at 2.

[339] *See* FIF III, Appendix 1 at 4.

[340] *See* IHS Markit Letter at 26–27.

[341] *See* Securities and Exchange Commission File No. 4–698 (National Market System Plan Governing the Consolidated Audit Trail), section 6.8(b). *See also* Securities Exchange Act Release No. 79318 (Nov. 15, 2016), 81 FR 84696 (Nov. 23, 2016).

[342] *See* 17 CFR 242.613(d)(3) (requiring the use of timestamp increments finer than the minimum so that all reportable events ''can be accurately sequenced'').

[343] *See* 17 CFR 242.605(a)(1)(i)(F) through (J) (detailing time-to-execution buckets of 0 to 9 seconds, 10 to 29 seconds, 30 to 59 seconds, 60 to 299 seconds and 5 to 30 minutes after the time of order receipt).

[344] *See* 17 CFR 242.605(a)(1)(ii)(D), (F), and (I), requiring share-weighted average period from the time of order receipt to the time of order execution for shares executed with price improvement, at the quote, and outside the quote, respectively.

[345] Analysis of Tick Size Pilot data shows more than 95% of market and marketable limit orders that executed did so within 1 second. *See* analysis in *infra* Figure 12. *See also infra* section VII.E.3.(b)(1) (analyzing execution speeds of market and marketable limit orders, along with the three categories of NMLOs currently required in Rule 605 (inside-the-quote, at-the-quote, and near-the-quote)).

[346] *See* 17 CFR 242.605(a)(1)(i)(F) (requiring the reporting of the cumulative number of shares of covered orders executed from 0 to 9 seconds after the time of order receipt).

types. The Commission believes that requiring average time to execution for all order types, in addition to statistics that would provide information about the distribution of execution times within each order type, would provide more meaningful information because these statistics could be used to compare the average time to execution for a particular order type, while still providing information about the extent to which outlier values do or do not skew the average.

Although average time to execution is currently required for marketable order types,[347] the Commission believes it would be both feasible and useful to measure average time to execution for non-marketable order types from the point in time they become executable. As stated above, this would provide a control for prevailing market conditions and benchmark orders from a point when such orders could reasonably be expected to execute. Therefore, the proposal would require the share-weighted average time to execution for non-marketable order types, calculated from the time such orders become executable.[348]

Because orders may execute near-instantaneously or over a number of minutes, average time to execution within a category could be skewed by outlier values. Given this, information about the distribution of execution speeds in addition to the average would still be useful. However, the existing time-to-execution buckets are of limited utility, especially for the fastest executions, given that the smallest time-to-execution bucket encompasses all orders executed between zero and nine seconds. Although finer increments could be added below one second, it would still be important to retain information for those orders that take longer to execute. Rather than adding additional buckets to provide this distribution information, the Commission proposes requiring both share-weighted median and 99th percentile time-to-execution statistics in order to provide additional descriptive statistical information for executions of all covered order types.[349] These two measurements would provide additional information to allow users of the data to assess how quickly a market center or broker-dealer is able to execute incoming orders and better understand whether and to what extent the time to execution within a particular category is affected by outlier values.

For these reasons, the Commission proposes to require share-weighted median and 99th percentile time to execution for all order types. Average time to execution statistics for marketable order types (market orders, marketable limit orders, marketable IOCs, and beyond-the-midpoint limit orders) would be required for each of: shares executed with price improvement,[350] at the quote,[351] and outside the quote.[352] For the marketable order types, the Commission is similarly proposing to require: (i) the share-weighted median period from the time or order receipt to the time of order execution;[353] and (ii) the share-weighted 99th percentile period from the time of order receipt to order execution.[354] For non-marketable order types (beyond-the-midpoint limit orders, executable NMLOs, and executable orders with stop prices NMLOs), the Commission proposes to require, for executed orders: (i) the share-weighted average period from the time the order becomes executable to the time of order execution;[355] (ii) the share-weighted median period from the time the order becomes executable to the time of order execution;[356] and (iii) the share-weighted 99th percentile period from the time the order becomes executable to the time of order execution.[357]

The Commission considered compressing the current time-to-execution buckets to a sub-second level (*i.e.,* less than 50 milliseconds, 50–500 milliseconds, 500 milliseconds to 1 second, and greater than 1 second). One commenter suggested that even more granular timestamps be used.[358] The proposed rule would not require the use of microsecond timestamps, for the reasons discussed above. The Commission solicits comment below on whether requiring the use of timestamps more granular than a millisecond would be appropriate.

Request for Comment

The Commission seeks comment generally on the changes to the timestamp conventions within Rule 605. In particular, the Commission solicits comment on the following:

27. Should Rule 605 require timestamps to be recorded at millisecond level granularity? Why or why not? Would it be preferable in Rule 605 for timestamps to be recorded at microsecond granularity (as suggested by one commenter) or nanosecond granularity? Please explain and provide data, if available. Should Rule 605 require market centers and larger broker-dealers to utilize timestamps in increments finer than milliseconds to the extent such entities' order handling or execution systems utilize finer increments? Why or why not? Would allowing some market centers and broker-dealers to utilize timestamps in increments finer than milliseconds affect the comparability of their execution quality statistics?

28. Do commenters believe the proposed level of timestamp granularity would enhance the usefulness of execution quality statistics? Why or why not?

29. Do commenters believe that the proposed statistical measures that would be required for time to execution (*i.e.,* average, median, and 99th percentile) are appropriate? If not, what statistics should be used?

30. Should the Commission require share-weighted average time to execution for non-marketable order types, measured from the time the order becomes executable? Should the Commission require share-weighted median and 99th percentile time-to-execution statistics, measured from the time an order becomes executable?

31. Should the Commission retain the required time-to-execution buckets for all order types, with revisions to the time intervals used? If so, should the Commission use the time buckets proposed by a commenter (*i.e.,* less than

[347] *See* 17 CFR 242.605(a)(1)(ii)(D), (G), and (H) for shares executed with price improvement, executed at the quote, or executed outside the quote, respectively.

[348] *See* proposed Rule 605(a)(1)(iii)(C), (D), and (E).

[349] *See* proposed Rule 605(a)(1)(ii)(D), (E), (H), (I), (M), and (N), and proposed Rule 605(a)(1)(iii)(D) and (E), requiring share-weighted median and share-weighted 99th percentile time to execution information. These measures would represent the time at or below which 50 percent of executions occur, weighted by number of shares (in the case of the share-weighted median) and the time at or below which 99 percent of executions occur, weighted by number of shares (in the case of the share-weighted 99th percentile).

[350] *See* 17 CFR 242.605(a)(1)(ii)(C).

[351] *See* 17 CFR 242.605(a)(1)(ii)(G).

[352] *See* 17 CFR 242.605(a)(1)(ii)(L).

[353] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, *see* proposed Rules 605(a)(1)(ii)(D), 605(a)(1)(ii)(H), and 605(a)(1)(ii)(M).

[354] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, *see* proposed Rules 605(a)(1)(ii)(E), 605(a)(1)(ii)(I), and 605(a)(1)(ii)(N).

[355] *See* proposed Rule 605(a)(1)(iii)(C).

[356] *See* proposed Rule 605(a)(1)(iii)(D).

[357] *See* proposed Rule 605(a)(1)(iii)(E). As a result, the use of time-to-execution buckets would no longer be necessary. Rule 605(a)(1)(i)(F) through (J) requires statistics for the cumulative number of shares of covered orders executed in separate time-to-execution buckets. Those requirements would be eliminated.

[358] *See* Healthy Markets II at 3 (suggesting use of the following execution time categories: less than 500 microseconds; 500 microseconds–1 millisecond; 1–10 milliseconds; 10–100 milliseconds; 100 milliseconds–1 second; and current categories).

500 microseconds; 500 microseconds–1 millisecond; 1–10 milliseconds; 10–100 milliseconds; 100 milliseconds–1 second; in addition to the current categories)?

4. Changes to Information Required for All Types of Orders

(a) Realized Spread

Rule 605 requires calculation of average realized spread for executions of all covered orders and is calculated by comparing the execution price of an order and the midpoint of the NBBO as it stands five minutes after the time of order execution.[359] The smaller the average realized spread, the more prices have moved adversely to liquidity providers after the order was executed, which shrinks the spread ''realized'' by the liquidity providers.[360] A low average spread indicates that a liquidity provider was providing liquidity even though prices were moving against it.[361] In the Adopting Release, the Commission also stated that the realized spread statistic ''can highlight the extent to which market centers receive uninformed orders (as indicated by higher realized spreads than other market centers), thereby potentially helping to spur more vigorous competition to provide the best prices to these orders to the benefit of many retail investors.'' [362] To the extent realized spreads capture adverse selection costs faced by liquidity providers, they provide a measure of the potential profitability of trading for liquidity providers.[363]

In order to proxy for this, realized spread measures the difference between the execution price and a future price. An ideal measurement horizon would be one that aligns with the amount of time an average liquidity provider holds onto its inventory positions and must be sufficiently long so that it captures a price reversal rather than a series of trades representing the same demand as the initial trade but not so long as to introduce unnecessary noise.[364]

The equities market moves much faster than it did in 2000,[365] and correspondingly any changes in market maker or liquidity provider positions and inventory occur much more quickly in the contemporary market environment. There is academic literature that argues that the current five-minute horizon has become inappropriate for a high-frequency environment.[366] One study posits that the five-minute time horizon should be replaced with a horizon of no more than 15 seconds for large cap stocks and 60 seconds for small cap stocks.[367]

Selecting an appropriate time horizon to calculate the realized spread is important, as realized spreads vary significantly as the time horizon is changed.[368] In order to examine this issue, the Commission analyzed how realized spreads vary when calculated over time horizons ranging from one second to five minutes, as well as how they differ based on market capitalization size, using TAQ data from February 2021 for a sample of 400 stocks from four different market capitalization groups (less than $100 million, $100 million to $1 billion, $1 billion to $10 billion, and over $10 billion).[369]

The results are presented in Figure 1, and show that realized spreads tend to decrease as the time horizon increases, and additionally show that they tend to decline as market capitalization size increases. Echoing results from the academic literature, the persistence of these systematic differences in realized spreads across market capitalization sizes implies that a time horizon that may be ideal for large cap stocks may be too short for small cap stocks.[370] As a result, the Commission believes that including multiple different time horizons for realized spreads would make this measure more relevant across a wider range of stocks.

Figure 1: Average Realized Spreads by Market Capitalization, February 2021

[359] *See* 17 CFR 242.600(b)(9). For buy orders, realized spread is double the amount of difference between the execution price and the midpoint of the NBBO five minutes after the time of order execution. For sell orders, realized spread is double the amount of difference between the midpoint of the NBBO five minutes after the time of order execution and the execution price. *See id.* The Commission is proposing to renumber the definition of ''average realized spread'' as proposed Rule 600(b)(13).

[360] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75424.

[361] *See id.*

[362] *Id. See also* Securities Exchange Act Release No. 84875 (Dec. 19, 2018), 84 FR 5202, n.587 (Feb. 20, 2019) (''The realized spread is the portion of the spread that market makers 'realize' after adverse selection costs are taken into account.'').

[363] *See, e.g.,* Larry Harris, *Trading and Exchanges: Market Microstructure for Practitioners* (Oxford University Press 2003) at 286 (''Informed traders buy when they think that prices will rise and sell otherwise. If they are correct, they profit, and whoever is on the other side of their trade loses. When dealers trade with informed traders, prices tend to fall after the dealer buys and rise after the dealers sell. These price changes make it difficult for dealers to complete profitable round-trip trades. When dealers trade with informed traders, their realized spreads are often small or negative. Dealers therefore must be very careful when trading with traders they suspect are well informed.'')

[364] *See, e.g.,* Roger Huang & Hans Stoll, *Dealer Versus Auction Markets: A Paired Comparison of Execution Costs on NASDAQ and the NYSE,* 41 J. Fin. Econ. 313–357 (1996).

[365] *See supra* note 98.

[366] *See, e.g.,* Maureen O'Hara, *High Frequency Market Microstructure,* 116(2) J. Fin. Econ. 257–270 (2015) (''O'Hara 2015''); Maureen O'Hara, Gideon Saar, & Zhuo Zhong, *Relative Tick Size and the Trading Environment,* 9(1) Rev. of Asset Pricing Stud. 47–90 (2019) (''O'Hara et al.''); Jennifer S. Conrad & Sunil Wahal, *The Term Structure of Liquidity Provision,* 136(1) J. Fin. Econ. 239–259 (2020) (''Conrad and Wahal'').

[367] *See* Conrad and Wahal.

[368] *See infra* Figure 13.

[369] *See infra* note 706 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and the specific numbers may be different following the implementation of the MDI Rules. In particular, for certain stocks, the NBBO midpoint may change, though the Commission is uncertain of the direction of this effect. This may impact statistics that are based on these values, including realized spreads. *See infra* section VII.C.1.(d). While specific numbers might change, the Commission does not expect the relative variation in realized spreads across different time horizons to change as a result of the implementation of the MDI Rules.

[370] *See* Conrad and Wahal.

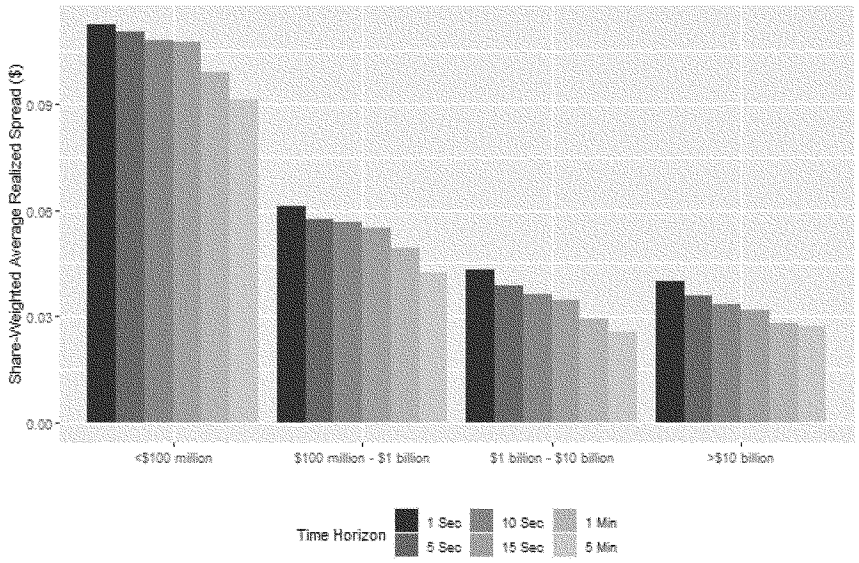

Figure 1: Average Realized Spreads by Market Capitalization, February 2021. This figure plots the share-weighted average realized spread using different time horizons, across four different market capitalization groups, using data from TAQ. See infra note 722 for dataset description. Measures grouped by size quartile were calculated on a stock-day basis, then averaged by stock, then averaged within each size quartile. This analysis uses data from prior to the implementation of the MDI Rules and numbers may be different following the implementation of the MDI Rules. See infra note 369 and infra section VII.C.1.d).

Further, the analysis of different time horizons and market capitalization shows that most of the difference in realized spread [371] is captured for the largest stocks at 15 seconds, but less than a third is captured for smaller cap stocks, as shown in Table 1 below.[372] However, at least half of the difference is captured for smaller cap stocks at one minute.[373] Therefore, the proposed time horizons of 15 seconds and one minute would capture most of the realized spread information, in particular for the largest stocks.[374]

TABLE 1—VARIATION IN AVERAGE REALIZED SPREAD, BY TIME HORIZON

Market cap group	1 sec–5 min ($)	Horizon		
		15 sec (%)	1 min (%)	5 min (%)
<$100 million	0.021	22.5	40.2	37.3
$100 million–$1 billion	0.019	33.2	29.7	37.1
$1 billion–$10 billion	0.017	48.5	30.5	21.0
>$10 billion	0.013	66.2	28.7	5.1

Table 1: Variation in Average Realized Spread, by Time Horizon. This table presents the difference between dollar realized spreads calculated using a 1-second time horizon and realized spreads calculated using a 5-minute time horizon, along with the percentage of variation in this difference that is captured at various time horizons (15 seconds, 1 minute, and 5 minutes), using data from TAQ. *See infra* note 722 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and numbers may be different following the implementation of the MDI Rules. *See supra* note 369 and *infra* section VII.C.1.(d).

Based on this analysis, for executions of covered orders, the Commission proposes that the average realized spread be calculated at specified intervals of 15 seconds and one minute after the time of execution.[375] The Commission believes that these timeframes are appropriate for liquid stocks and for thinly traded stocks because, as suggested by available academic literature and supported by the analysis in this release, realized spreads are likely to be most impacted during the first 15 seconds, for large stocks, and one minute, for small stocks, following a trade.[376] The Commission is proposing to require realized spreads to be calculated at both intervals in order

[371] Generally, if most of the difference between realized spreads is captured at a particular time horizon, then this implies that most of the relevant information has been incorporated into the realized spreads.

[372] Specifically, analysis shows the 15-second horizon captures over 66.2% of the overall decline in realized spreads for the group corresponding to the largest stocks, but captures less than a third of this decline in the two groups corresponding to smaller stocks. Analysis also shows that the 15-second horizon captures almost 50% of the overall decline in realized spreads for those stocks with a market capitalization of between $1 billion and $10 billion.

[373] By the one-minute horizon, realized spreads have captured more than 50% of the overall decline in realized spreads for all stocks, and a substantial majority for the two groups of larger stocks (79% and 94.9%).

[374] For the two smaller-stock groups, a sizeable proportion of the overall decline (37%) does not occur until the five-minute horizon. *See infra* section VII.E.3.(c)(1) for a discussion of including additional time horizons, including the five-minute horizon, for calculating realized spreads.

[375] *See* proposed Rule 605(a)(1)(i)(G) and(I). In order to accommodate calculation of ''average realized spread'' at two different time intervals, the Commission proposes to modify the existing definition of ''average realized spread'' to replace the reference to five minutes with a ''specified interval.'' *See* proposed Rule 600(b)(13).

[376] *See* Conrad and Wahal.

to provide relevant information for symbols with different liquidity characteristics. While commenters supported moving away from the current five-minute calculation, they suggested different time horizons.[377] Although both shorter (50ms, 100ms) and longer (three minute, five minute)[378] time horizons would provide useful information for certain groups of stocks, each additional time horizon adds to the computational burden of preparing the reports and increases the size and complexity of the reports, adding to the costs that market participants face when collecting, interpreting, and evaluating Rule 605 reports. Additional time horizons would likely only provide additional benefits for smaller subsets of stocks, while the 15-second and one minute time horizons would generally provide informative average realized spread metrics across the universe of stocks with different market capitalization and different liquidity characteristics.

Finally, in connection with both the average realized spread and average effective spread[379] statistics, the Commission has also considered, but is not including in the proposed rule text, an updated method by which the spread is calculated by incorporating a weighted midpoint.[380] However, as is discussed in section VII.E.3.(c)(3) below, the midpoint requires data only on the best available bid and ask price.[381] In contrast, calculating the weighted midpoint would require that reporting entities additionally collect data on the depth available at the NBBO.[382] Furthermore, the midpoint may be easier to compute and interpret, as it is more familiar to market participants than the weighted midpoint.

(b) Average Effective Spread

Rule 600(b)(8) defines ''average effective spread'' as the share-weighted average of effective spreads for order executions calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at the time of order receipt and, for sell orders, as double the amount of difference between the midpoint of the national best bid and national best offer at the time of order receipt and the execution price.[383] Currently, average effective spread is required to be calculated only for market and marketable limit order types and doing so requires the comparison of the execution price of an order with the midpoint of the NBBO at the time of order receipt. The Commission proposes to expand effective spread reporting requirements to include all covered orders, and to modify the methodology for calculating this metric for executable NMLOs, beyond-the-midpoint limit orders, and executable stop orders.

Average effective spread provides a measure of spread actually paid by investors at a particular market center.[384] Generally, for marketable order types, average effective spread provides a measure of the price paid for the immediacy of execution. However, because they are less aggressively priced, NMLOs are not typically submitted with the expectation that they will be executed immediately. Instead, they are submitted with the expectation that they rest and provide liquidity (if executed). Therefore, average effective spread for NMLOs and orders submitted with stop prices provides a measure of the amount a liquidity provider could expect to earn for providing liquidity. The Commission proposes to revise the definition of ''average effective spread'' to specify that, for order executions of NMLOs[385] and orders submitted with stop prices, average effective spread be calculated from the time the order becomes executable.[386] Because the concept of ''executable'' controls for prevailing market conditions, benchmarking average effective spread statistics for these non-marketable order types from the time such orders become executable would permit average effective spread statistics for these order types to be more informative of execution quality received.

The Commission proposes to prescribe the collection of this data point for executable NMLOs, beyond-the-midpoint limit orders, and executable stop orders by adding proposed Rule 605(a)(1)(i)(K) to require the calculation of average effective spread for executions of covered orders, which includes executable NMLOs and executable stop orders.[387]

(c) Percentage Spreads (Effective and Realized)

Currently, Rule 605 statistics include the average realized spread and average effective spread for executions of covered orders. To compare these dollar-based statistics across the data population while taking into account the wide range of stock prices, dollar-based statistics need to be converted into percentages. While obtaining historical price information for individual securities is possible, in the Commission's experience since the implementation of Rule 605, such calculations are time- and resource-intensive, especially across multiple time periods and securities. Furthermore, the Commission believes that using percentage-based spread measures could provide additional information at the individual stock level if a stock's price changes significantly during a month.

Therefore, the Commission proposes requiring dollar-based spread statistics (*i.e.,* effective spread and realized spread) to also be reported as percentages because a percentage measure would account for differing underlying stock prices and better facilitate comparisons of spread statistics across different time periods and securities.[388] The proposed definitions for ''average percentage effective spread'' and ''average percentage realized spread'' would provide the same calculation as the dollar-based effective and realized spread statistics for the numerator.[389]

[377] Two commenters suggested expanding realized spread into 50ms, 100ms, and three minute buckets to better identify adverse selection. *See* KOR Group I at 4; Healthy Markets II at 3. One commenter suggested that if the realized spread statistic is to remain, the Commission should either determine an appropriate time-scale for the measurement or re-affirm the current five minutes duration. *See* FIF III at 10.

[378] Analysis shows that retaining a five-minute horizon, in addition to the proposed one-minute and 15-second horizon, would capture additional information about realized spreads, particular for the smallest stocks. *See infra* section VII.D.1.(b)(1)(c)(ii). However, as stated above, the one-minute time horizon would still capture more than 50% of the variation in realized spreads for the smallest cap stocks. *See supra* note 373.

[379] *See infra* section IV.B.4.b).

[380] The weighted midpoint is calculated using the following formula: weighted midpoint = ((bid price × quantity at the ask price) + (ask price × quantity at the bid price))/(quantity at the ask price + quantity at the bid price). *See, e.g.,* Björn Hagströmer, *Bias in the Effective Bid-Ask Spread,* 142(1) J. Fin. Econ. 314–337 (2021).

[381] *See infra* section VII.E.3.(c)(3).

[382] This might not be a significant additional cost, as reporting entities would be required to collect information on NBBO depth for computing the size improvement benchmark measure under the proposed amendments. *See infra* section IV.B.4.(e).

[383] *See* 17 CFR 242.600(b)(8). All orders that require reference to a consolidated BBO that has been crossed for 30 seconds or more are exempt. *See* Letter from Annette L. Nazareth, Director, Division, Commission, to Stuart J. Kaswell, Senior Vice President and General Counsel, Securities Industry Association (Mar. 12, 2001) (''SIA Exemption Letter'').

[384] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75415.

[385] As noted above, beyond-the-midpoint limit orders are a type of NMLO.

[386] *See* proposed Rule 600(b)(10).

[387] *See* proposed Rule 605(a)(1)(i). The Commission also proposes to delete the current average effective spread calculation requirement in Rule 605(a)(1)(ii)(A), which previously applied only to market and marketable limit orders, because this measurement, with the inclusion of marketable IOCs, beyond-the-midpoint limit orders, executable NMLOs, and executable orders with stop prices, would be included in proposed Rule 605(a)(1)(i)(K).

[388] *See* proposed Rule 605(a)(1)(i)(H), (J), and (L).

[389] *See* proposed Rule 600(b)(11) and (12).

The denominator for dollar-based spread percentages would be the midpoint of the NBBO at either the time of order receipt (for marketable order types) or the time an order first becomes executable (for non-marketable order types) in order to provide a consistent measure of the prevailing stock price from the point when an order could reasonably be expected to execute. This would then be averaged on a share-weighted basis for the month.

Specifically, average percentage effective spread would be calculated for each transaction as double the amount of the difference between the execution price and the midpoint divided by the midpoint. The midpoint used would be at either the time of order receipt [390] or the time of executability.[391] Then the percentage would be averaged on a share-weighted basis.[392]

Similarly, average percentage realized spread would be calculated as the realized spread for an order, divided by the midpoint of the NBBO at the time of order receipt (for marketable order types) or executability (for non-marketable order types).[393] For each buy transaction, realized spread would be double the amount of difference between the execution price and the midpoint of the NBBO at both 15 seconds and one minute after the time of order execution.[394] For each sell transaction, realized spread would be double the amount of difference between the midpoint of the NBBO at both 15 seconds and one minute after the time of order execution and the execution price.[395] Then the percentage would be averaged on a share-weighted basis for the month to calculate that month's average 15-second and one-minute realized spread percentage for each category.

(d) Effective Over Quoted Spread (E/Q)

The Commission understands that market participants often use effective over quoted spread (''E/Q'') [396] as a measure of execution quality.[397] E/Q is generally expressed as a percentage that represents how much price improvement an order received.[398] An E/Q of 100% means a buy order was executed at the national best offer or a sell order was executed at the national best bid. An E/Q of 0% means an order was executed at the midpoint of the NBBO.

Rule 605 does not require quoted spreads to be reported, although average quoted spread can be derived from existing Rule 605 statistics.[399] However, along with the proposed requirement to include percentage-based realized and effective spread statistics, it would improve the comparability of price improvement statistics across symbols to include share-weighted average E/Q. Further, the Commission understands E/Q is already often-used and well-understood by industry participants. Currently, although average E/Q can be derived under Rule 605, E/Q is a relatively simple metric to capture contemporaneously with an execution. Given the common usage of the metric, requiring a separate field for E/Q would increase the ability of market participants to access and utilize E/Q to compare price improvement statistics across securities, and across market centers and broker-dealers.

Deriving average quoted spread from the existing reports involves additional computational burdens. Further, there are likely to be differences in E/Q on a per transaction basis that may yield a different average E/Q than extrapolating an average quoted spread for the month and using that to calculate an average monthly E/Q, which is a noisier measure of E/Q.[400] Therefore, the Commission proposes to require, for executions of all covered orders, a statistic for the average effective over quoted spread, expressed as a percentage.[401] Share-weighted average E/Q would be calculated by dividing effective spread by quoted spread[402] for *each* transaction and then averaging that over the month (weighted by number of shares). The quoted spread would be the difference between the national best bid and the national best offer at either the time of order receipt (for marketable order types) or the time an order first becomes executable (for non-marketable order types).[403] This would provide a consistent measure of the prevailing quoted spread at the point when an order could reasonably be expected to execute. Expressing share-weighted average E/Q as a percentage would provide an additional data point that could be used to evaluate price improvement across symbols or the entire data population.

(e) Size Improvement

Rule 605 reports are required to include price improvement metrics but do not indicate whether orders received an execution of more than the displayed size at the quote. The Commission considered whether to add a measure of ''size improvement'' or ''liquidity enhancement'' when adopting Rule 605, but did not add this type of measure in part to minimize the complexity and quantity of statistics, and in part because certain measures, such as effective spread, already reflected a market center's ability to execute above the displayed size.[404] Share-weighted effective spread metrics may provide information about size improvement, since effective spread will be larger for orders that have to ''walk the book'' (*i.e.,* consume available depth beyond the best quotes). However, effective spread combines both price and size information; therefore, it is difficult to distinguish whether, for example, a low effective spread arises because the market center consistently offered better prices to small orders, or was able to offer better prices to several very large orders. Market participants have expressed support for a size improvement measure,[405] and orders are

[390] The time of order receipt would be used for market orders, marketable limit orders, and marketable IOCs. *See* proposed Rule 600(b)(11).

[391] The time an order becomes executable would be used for NMLOs, beyond-the-midpoint limit orders, and orders submitted with stop prices. *See* proposed Rule 600(b)(11).

[392] *See* proposed Rule 600(b)(11).

[393] *See* proposed Rule 600(b)(12).

[394] Proposed Rule 600(b)(12) provides that the midpoint would be calculated at a ''specified interval'' after the time of order execution. Proposed Rule 605(a)(1)(i)(H) and (J) would require average percentage realized spread to be calculated at 15 seconds and one minute, respectively, after the time of execution. The Commission is proposing the use of the 15 second and one minute time period for the reasons discussed in *supra* section IV.B.4.(a).

[395] *See* proposed Rule 600(b)(12) and proposed Rule 605(a)(1)(i)(G) and (I).

[396] Quoted spread is the difference between the national best bid and the national best offer at the time an order is received.

[397] *See, e.g.,* Bill Alpert ''Who Makes Money on Your Stock Trades,'' Barron's, Feb. 28, 2015 (retrieved from Factiva database) (stating ''the industry's acid-test [execution] quality measure is the ratio of effective spread over the quoted spread, or E/Q''); *https://investor.vanguard.com/about-us/brokerage-order-execution-quality#:~:text=Effective%20over%20quoted%20spread*,in%20our%20low%20E%2F.* A commenter stated that E/Q is a commonly used metric of execution quality that measures how effectively a market maker prices a customer's order relative to the prevailing NBBO. *See* Citi Letter at 3.

[398] *See, e.g., https://us.etrade.com/trade/execution-quality#:~:text=Effective%20spread%20over%20quoted%20spread,between%20the%20bid%20and%20offer.*

[399] Average quoted spread can be derived on a per symbol basis by adding average effective spread and double the amount of total average per share price improvement or dis-improvement (*i.e.,* amount of price improvement times price improved share count, less amount of price dis-improvement times price dis-improved share count, divided by total number of executed shares).

[400] *See infra* note 878 and accompanying text.

[401] *See* proposed Rule 605(a)(1)(i)(M).

[402] *See* proposed Rule 600(b)(9) (defining ''average effective over quoted spread'').

[403] *See id.*

[404] *See* Adopting Release, 65 FR at 75425.

[405] *See, e.g.,* FIF III, at 2; Virtu Petition at 3–4. The petitioner states that the ''single biggest shortcoming'' of Rule 605 is that it does not reflect

Continued

often larger than the displayed size at the NBBO.[406] The Commission also stated in the MDI Adopting Release that the decimalization of securities pricing in 2001, and the resulting shift away from the larger fractional quoting and trading increments, had significant implications for the amount of liquidity available at the top of book.[407] Market participants have raised concerns about reduced price transparency and difficulty executing large transactions at the best prices due to lower concentrations of trading interest at the top of book.[408] The Commission believes that the use of size improvement statistics could help address these concerns by providing users of the statistics with information relating to which market centers and broker-dealers are more likely to be able to fill larger-sized orders at or better than the NBBO.

The Commission proposes adding a benchmark metric that would, in combination with information about execution sizes, indicate the level of size improvement, *i.e.,* whether orders received an execution greater than the displayed size at the quote. Analysis of a sample of 100 symbols during March of 2019 indicates only a moderate level of correlation between standard price improvement metrics and a measure of size improvement, indicating that these measures may contain different information about execution quality.[409] Given that existing execution quality metrics do not include metrics for size improvement, nor any metrics that serve as an adequate proxy for a size improvement statistic, the Commission proposes to include a benchmark metric for all executions of covered orders. Specifically, proposed Rule 605(a)(1)(i)(F) requires, for executions of all covered orders, the reporting of the cumulative number of shares of the full displayed size of the protected bid at the time of execution, in the case of a market or limit order to sell; and for the full displayed size of the protected offer at the time of execution, in the case of a market or limit order to buy. This would capture the full displayed size at the quote on the side of the NBBO against which a buy or sell order would be expected to execute. Pursuant to the proposed rule, for each order, the share count shall be capped at the order size if the full displayed size of the national best bid or national best offer is larger than the order. This would prevent skewing of the size improvement benchmark if the national best bid or national best offer outsized any particular order. By limiting this measure to only the full displayed size of the protected bid or offer that would have been available to a particular order, the benchmark would represent what could be have been executed at the protected bid or offer.

This benchmark metric can be combined with information about the number of shares that a market center or broker-dealer executed at or above the quote to measure a market center or broker-dealer's ability to offer customers execution at the quote (or better), even when an order's full size at the quote is not available. For example, if a market center executes a 500 share order to buy at a price at or better than the national best offer, and there are currently 200 shares displayed at the national best offer, the associated benchmark metric for the order would be 200 shares because there were only 200 shares available to fill the order at the best displayed quote. This benchmark share count could then be compared to the number of shares executed at the best displayed quote (in this case, 500 shares) to capture whether the market center filled any part of the customer order at the national best offer (or better), even when there was no depth available at the national best offer (''size improvement share count''). To continue the preceding example, the size improvement share count would be $500 - 200 = 300$ shares, since the market center was able to offer the best displayed quote to 300 shares more than the depth available at the best-displayed quote.[410]

The petitioner suggested an alternative metric: real price improvement (''RPI''), which combines price improvement (*i.e.,* trades at prices better than the NBBO price) and size improvement (*i.e.,* transactions executed for share quantities greater than shares displayed at the NBBO and at prices at or better than the NBBO price).[411] The petitioner stated that RPI reflects the true benefits received by retail investors.[412] RPI would use as its benchmark a price that ''reflects the equivalent size of shares—including depth of book quotes and odd lot quotes.''[413] Because the calculation of RPI takes into account the complete set of information related to the consolidated depth of book, RPI may be a more informative measure of size improvement than a measure that can be calculated using the size improvement benchmark metric proposed. However, because the complete set of consolidated depth of book information is not available from public data sources, the RPI would require market centers and reporting broker-dealers to subscribe to all exchanges' proprietary depth-of-book data feeds, which would entail a significant cost for those reporting entities that do not already subscribe to these feeds.[414] The

any benefits received by retail investors on orders that outsize the NBBO, including size improvement. *See* Virtu Petition at 3. The petitioner states that retail investors deserve more complete execution quality reports that provides transparency about the amount of size improvement that their orders are receiving. *See id.* at 4. The petitioner specifically states that Rule 605 reporting would be more complete if market participants could assess execution quality by comparing the fill prices on their orders to a reference benchmark that includes all displayed liquidity on exchanges, including resting odd-lots that are visible in market data feeds. *See id.*

[406] For example, the petitioner stated that ''approximately 45% of shares (and 54% of the value traded) filled by [the petitioner] in 2020 were from orders that outsized the NBBO.'' Virtu Petition at 3.

[407] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18606.

[408] *See id.* at 16751 n.278 and accompanying text (citing the Investment Company Institute letter describing the difficulty of institutional investors' ability to execute large orders). Shortly after decimalization became a reality, the GAO noted that the average executed trades size declined by 67% on NYSE and 41% on NASDAQ. *See* GAO Report, ''Decimal Pricing Has Contributed to Lower Trading Cost and a More Challenging Trading Environment,'' May 2005, at 37.

[409] *See infra* section VII.E.3.(d)(1). *See infra* notes 882–883 for a description of the sample selection and analysis.

[410] Note that capping the benchmark metric at the order size prevents the size improvement share count from turning negative in situations when depth at the best displayed quote exceeds the customer-requested order size. For example, consider a case in which a market center executes an order for 200 shares when there are currently 500 shares displayed at the national best offer. If the benchmark share count were not capped at the order size, the size improvement share count would be $200 - 500 = -300$ and would become more negative the more depth there is available at the NBBO, which would reduce a market center's total monthly size improvement share count, simply for fulfilling the customer's request to only execute 200 shares and not the full 500 shares that were available at the national best offer. Instead, the benchmark share count would be capped at the order size, and the benchmark share count would still be 200 shares. The size improvement share count would be $200 - 200 = 0$ shares, capturing the fact that the market center did not offer the national best offer price (or better) to any shares over and above the depth available at the best displayed quote.

[411] *See* Virtu Petition at 3.

[412] *See id.* Additionally, the EMSAC suggested a similar measure—Enhanced Liquidity—designed to indicate for the proportion of shares greater than the available shares displayed at NBBO that were executed at or better than the NBBO. *See* EMSAC III at 2, n.3 and accompanying text.

[413] Virtu Petition at 5.

[414] In a white paper, one market center estimated its costs related to subscribing to depth of book data feeds for 11 exchanges to be between $51,480 and $226,320 per exchange per year. *See* IEX, Jan. 2019, ''The Cost Of Exchange Services,'' *available at https://iextrading.com/docs/The%20Cost%20of%20Exchange%20Services.pdf.*

proposed rule would not require an RPI benchmark or measure, as the Commission preliminarily believes the benefits to market participants from having access to a potentially more accurate measure of size improvement are not justified by these potentially significant additional costs to reporting entities.[415]

(f) Riskless Principal

In effecting riskless principal transactions, a market center submits a principal order to another market center in order to fulfill a customer order. Upon execution at the away market center, the receiving market center executes the customer transaction on the same terms as the principal execution.[416] Generally, under the current Rule, a market center that executes the riskless principal leg of the trade (*i.e.,* the receiving market center's execution of the customer order on the same terms as the principal transaction) reports those orders in its Rule 605 statistics as part of the cumulative number of shares of covered orders that were executed at the receiving market center under Rule 605(a)(1)(i)(D), rather than as a part of the cumulative number of shares of covered orders executed at any other venue under Rule 605(a)(1)(i)(E).[417] However, because the away market center is also reporting execution of the principal order as part of its shares executed at the receiving market center, this results in both of these legs of the transaction being counted as executed at the receiving market center, which could obscure information about how often a market center internalizes orders. Wholesalers may choose between internalizing orders or executing orders on a riskless principal basis. This choice has an effect on execution quality because internalized orders are not exposed to competition, whereas the principal order associated with a riskless principal transaction may be exposed to trading interest from other market participants. Therefore, it would be useful for investors to be able to observe what percentage of orders a wholesaler internalizes.

Accordingly, Rule 605's execution quality statistics would be more informative to market participants and other users of the Rule 605 reports if riskless principal orders were reported as executed at another venue, rather than as executed at the market center. The Commission proposes to carve riskless principal orders out from proposed Rule 605(a)(1)(i)(D) by providing that the number of shares of covered orders executed at the receiving market center, broker, or dealer excludes shares that the market center, broker, or dealer executes on a riskless principal basis.[418] As a result, the market center that executes the riskless principal order would include these shares as part of the cumulative number of shares executed at any other venue under Rule 605(a)(1)(i)(E), and only the market center that executes the corresponding principal order would include those shares as part of the cumulative number of shares executed at the receiving market center under proposed Rule 605(a)(1)(i)(D).

Request for Comment

The Commission seeks comment generally on the changes to the information required for all order types, including the calculation of average realized spread for executed orders, the calculation of average effective spread for NMLOs, percentage-based spread statistics, E/Q statistics, size improvement measures, and the treatment of riskless principal transactions. In particular, the Commission solicits comment on the following:

32. Should realized spread be required to be calculated 15 seconds and one minute after execution? Why or why not? If not, what alternative interval(s) do commenters recommend and why? Please explain and provide data, if available.

33. Some academic research suggests that the use of a weighted midpoint would be more appropriate when calculating realized and effective spreads.[419] Do commenters believe a weighted midpoint would be more appropriate? If so, why? Would additional costs be associated with utilizing a weighted midpoint?

34. Should average effective spread be required to be calculated for NMLOs and orders submitted with stop prices? Do commenters agree with the proposed average effective spread calculation methodology that would be required for executable NMLOs and executable stop loss orders?

35. Should dollar-based spread statistics (*i.e.,* effective and realized spread) also be required to be reported as a percentage? Do commenters believe there are other ways to represent spread statistics that could be helpful? If so, how should spread statistics also be reported?

36. Should share-weighted average E/Q expressed as a percentage be required to be calculated for all order types? Do commenters agree that share-weighted average E/Q expressed as a percentage would improve the comparability of price improvement statistics across symbols? If not, why?

37. With respect to proposed Rule 605(a)(1)(i)(F), do commenters support adding a requirement to include the proposed metric designed to, in combination with execution metrics, indicate whether orders received an execution greater than the displayed size at the quote (*i.e.,* size improvement)? Why or why not?

38. The Commission seeks comment on whether the addition of the proposed metric for size improvement would be sufficient to indicate whether orders received an execution greater than the displayed size of the quote. Should the Commission require a comparison of fill prices to a reference benchmark that includes depth of book and odd-lot information (*i.e.,* RPI), or some other liquidity measurement?[420] If so, why?

39. Should riskless principal orders not be required to be counted as orders executed at the receiving market center, broker, or dealer for the purpose of computing Rule 605 statistics and instead be classified as orders executed away? Why or why not?

5. Additional Required Information for Market, Marketable Limit, Marketable IOC, and Beyond-the-Midpoint Limit Orders

The MDI Rules expanded the data that will be made available for dissemination within the national market system (''NMS data'').[421] One goal of the expansion of NMS data is to increase transparency about the best-priced quotations available in the market. To further increase transparency about the

[415] *See also infra* section VII.E.3.(d)(1) for a more detailed discussion of the potential benefits and costs of RPI.

[416] *See* Securities Exchange Act Release No. 47364 (Feb. 13, 2003), 68 FR 8686, n. 33 (Feb. 24, 2003) (generally describing riskless principal transactions ''as trades in which, after receiving an order to buy (or sell) from a customer, the broker-dealer purchases (or sells) the security from (or to) another person in a contemporaneous offsetting transaction'').

[417] We note that Commission staff has taken the position that the market center executing an order as riskless principal should reflect the order on its monthly report as executed at such market center, and not at another venue, using the time that the order was executed at such market center. *See* Staff Legal Bulletin No. 12R, ''Frequently Asked Questions About Rule 11Ac1–5'' (June 22, 2001).

[418] *See* proposed Rule 605(a)(1)(i)(D).

[419] *See supra* note 380.

[420] As is noted above, the petitioner specifically states that Rule 605 reporting would be more complete if market participants could assess execution quality by comparing the fill prices on their orders to a reference benchmark that includes all displayed liquidity on exchanges, including resting odd-lots that are visible in market data feeds. *See* Virtu Petition at 4.

[421] *See* MDI Adopting Release.

availability of the best priced odd-lot orders in the market, the Commission also included certain odd-lot information in NMS data as part of the MDI Rules.[422] The Commission is proposing to add a definition for ''best available displayed price,'' which would include the best priced odd-lot if that price is inside the NBBO in order to provide additional price improvement statistics.[423]

Odd-lot information is defined as (1) odd-lot transaction data disseminated pursuant to the effective national market system plan or plans required under 17 CFR 242.603(b) as of April 9, 2021,[424] and (2) odd-lots at a price greater than or equal to the national best bid and less than or equal to the national best offer, aggregated at each price level at each national securities exchange and national securities association.[425] The Commission stated that making the best priced quotations available in core data is consistent with the Commission's goal in expanding the content of NMS information—enhancing the availability and usefulness of the information.[426]

The Commission is proposing to add a definition for ''best available displayed price'' which shall mean, with respect to an order to buy, the lower of (i) the national best offer at the time of order receipt or (ii) the price of the best odd-lot order to sell at the time of order receipt as disseminated pursuant to an effective transaction reporting plan or effective national market system plan; and, with respect to an order to sell, the higher of (i) the national best bid at the time of order receipt or (ii) the price of the best odd-lot order to buy at the time of order receipt as disseminated pursuant to an effective transaction reporting plan or effective national market system plan.[427] In each case, an order to buy or an order to sell would be benchmarked against the best price on the side of the market against which it could expect to receive an immediate execution. Because a beyond-the-midpoint limit order may be a covered order even if received outside of regular trading hours or when an NBBO is not being disseminated, the Commission proposes to specify that, for beyond-the-midpoint limit orders, the best available displayed price shall be determined at the time such order becomes executable instead of the time of order receipt.[428] Generally, the time of order receipt and the time the order is considered executable would be the same for a beyond-the-midpoint-limit order, except in those cases where it is received outside of regular trading hours or when an NBBO is not being disseminated. Therefore, measuring from the point of executability would ensure that a best available displayed price can be determined.

The Commission is further proposing to add two definitions relating to the best available displayed price in order to add price improvement statistics. ''Executed outside the best available displayed price'' shall mean, for buy orders, execution at a price higher than best available displayed price; and, for sell orders, execution at a price lower than the best available displayed price.[429] ''Executed with price improvement relative to the best available displayed price'' shall mean, for buy orders, execution at a price lower than the best available displayed price and, for sell orders, execution at a price higher than the best available displayed price.[430] Similar to the existing definitions for ''executed outside the quote'' [431] and ''executed with price improvement,'' [432] these definitions would classify order executions based on their execution price relative to the best available displayed price.

The Commission also proposes to add to Rule 605(a)(1)(ii) additional price improvement statistics specifically related to the best available displayed price. These statistics mirror the existing price improvement statistics for marketable order types executed better than, at, and outside the quote. Specifically, for each category, these additional price improvement statistics would provide a cumulative share count and a share-weighted average amount per share that prices were improved as compared to the best available displayed price. The Commission is proposing Rule 605(a)(1)(ii)(O), which would require the reporting of the cumulative number of shares of covered orders executed with price improvement relative to the best available displayed price. Proposed Rule 605(a)(1)(ii)(P) would require, for shares executed with price improvement relative to the best available displayed price, the share-weighted average amount per share that prices were improved as compared to the best available displayed price. Proposed Rule 605(a)(1)(ii)(Q) would require the reporting of the cumulative number of shares of covered orders executed at the best available displayed price. Proposed Rule 605(a)(1)(ii)(R) would require the reporting of the cumulative number of shares of covered orders executed outside the best available displayed price. Finally, proposed Rule 605(a)(1)(ii)(S) would require, for shares executed outside the best available displayed price, the share-weighted average amount per share that prices were outside the best available displayed price. These five metrics, in conjunction with each other, would allow market participants to evaluate how well market centers and broker-dealers perform in executing covered orders relative to the best available displayed price.

The Commission outlined a phased transition plan for the implementation of the MDI Rules, including the implementation of odd-lot order information.[433] The Commission stated that competing consolidators could offer a product that contains only information on the best priced odd-lot on each exchange.[434] The Commission is separately proposing to, among other things: (1) accelerate the implementation of the round lot and the odd-lot information definitions; and (2) amend the definition of odd-lot

[422] *See* 17 CFR 242.600(b)(59); MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18613. The Commission outlined a phased transition plan for the implementation of the MDI Rules, including the implementation of odd-lot order information. *See* MDI Adopting Release, 86 FR at 18698–701.

[423] The Commission is separately proposing to, among other things, amend the definition of odd-lot information to include a new data element to identify the best odd-lot orders available in the market inside the NBBO. *See* Minimum Pricing Increments Proposal. The Commission encourages commenters to review that proposal to determine whether it might affect their comments on this proposing release.

[424] Odd-lot transaction information is currently collected, consolidated, and disseminated by the exclusive SIPs. *See* Securities Exchange Act Release Nos. 70793 (Oct. 31, 2013), 78 FR 66788 (Nov. 6, 2013) (order approving Amendment No. 30 to the UTP Plan to require odd-lot transactions to be reported to consolidated tape); 70794 (Oct. 31, 2013), 78 FR 66789 (Nov. 6, 2013) (order approving Eighteenth Substantive Amendment to the Second Restatement of the CTA Plan to require odd-lot transactions to be reported to consolidated tape).

[425] *See* 17 CFR 242.600(b)(59); MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18613. The Commission is separately proposing to, among other things, accelerate the implementation of the round lot and the odd-lot information definitions. *See* Minimum Pricing Increments Proposal.

[426] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18613.

[427] *See* proposed Rule 600(b)(14). Because the best odd-lot order to buy or sell would be inside the NBBO, the national best bid or national best offer would only be used if there is not a best odd-lot price on the same side of the market as the order.

[428] *See id.*

[429] *See* proposed Rule 600(b)(44).

[430] *See* proposed Rule 600(b)(47).

[431] *See* 17 CFR 242.600(b)(35). The Commission is proposing to renumber the definition of ''executed outside the quote'' as proposed Rule 600(b)(45).

[432] *See* 17 CFR 242.600(b)(36). The Commission is proposing to renumber the definition of ''executed with price improvement'' as proposed Rule 600(b)(46).

[433] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18698–701.

[434] *See id.* at 18753.

information to include a new data element to identify the best odd-lot orders available in the market inside the NBBO.[435]

As is discussed above[436] and in the MDI Adopting Release, orders currently defined as odd-lots often reflect superior pricing.[437] A recent academic working paper shows that odd-lots offer better prices than the NBBO 18% of the time for bids and 16% of the time for offers.[438] The Commission believes it would be beneficial to require price improvement statistics relative to the best available displayed price for marketable order types (*i.e.,* market, marketable limit, marketable IOC, and beyond-the-midpoint limit orders). In some cases, this may be equal to the national best bid or national best offer. However, in some cases, the best price available may be reflected in an odd-lot price. Under the current 605 reporting requirements, an order executed inside the NBBO would be an order executed with price improvement. Currently, there is no way for market participants to evaluate the performance of broker-dealers and market centers relative to the *best* inside the NBBO odd-lot when such better-priced orders are present. The Commission believes requiring price improvement statistics relative to the best available displayed price in the market, whether that is the NBBO or the best odd-lot order to buy or sell, would enhance the ability of market participants to evaluate order performance.

Request for Comment

The Commission seeks comment generally on changes to information required for market, marketable limit, marketable IOC, and beyond-the-midpoint limit orders, including time-to-execution statistics and price improvement statistics relative to the best available displayed price. In particular, the Commission solicits comment on the following:

40. Do commenters agree with the proposed definition of ''best available displayed price''? Do commenters believe this definition would be helpful in the calculation of the price improvement statistics? Why or why not?

41. Should the execution quality statistics be required to include price improvement relative to the best available displayed price? Why or why not? What additional statistics would be beneficial?

42. If odd-lot price information is not disseminated pursuant to an effective transaction reporting plan, what do commenters believe would be a viable substitute for a best odd-lot price for purposes of calculating price improvement statistics relative to the best available displayed price? Would use of substitute data provide a sufficiently standardized benchmark? Please explain.

6. Additional Required Information for Executable NMLOs, Executable Stop Orders, and Beyond-the-Midpoint Limit Orders

As discussed above,[439] the Commission recognizes the need for more meaningful measures of execution quality for NMLOs and orders submitted with stop prices.

First, proposed Rule 605(a)(1)(iii)(A) would require the reporting of the number of orders that received either a complete or partial fill. Although the cumulative number of shares executed is required to be reported for all order types,[440] the Commission believes the number of orders filled would provide important additional information about the nature of a market center or broker-dealer's NMLO and stop order executions—*e.g.,* whether a high executed cumulative share count represents, on average, larger execution sizes or a higher count of orders receiving executions.

Second, the Commission is proposing Rule 605(a)(1)(iii)(B) to require the reporting of the cumulative number of shares executed regular way at prices that could have filled the order while the order was in force, as reported pursuant to an effective transaction reporting plan or effective national market system plan.[441] The Commission believes that market participants would benefit from more information about the number of shares that executed while an executable NMLO or executable order submitted with a stop price was in force. If a market center or broker-dealer is unable to execute NMLOs or stop orders despite a large number of shares executing in the market at large, market participants may want to take that into account when selecting a market center or broker-dealer. One commenter suggested a new execution quality metric called a ''non-marketable benchmark.''[442] The commenter's benchmark would ''provide a reference for evaluating the extent to which an NMLO could have been filled'' and considers shares executed on national market system exchanges as well as regular way off-exchange executions reported to the FINRA trade reporting facility.[443] Under the proposal, the share count for each order would be capped at the order size. This would allow market participants to see how much activity took place while executable NMLOs and executable orders submitted with stop prices were in force and could give market participants an indication of how effective the market center or broker-dealer is at executing NMLOs and stop orders. This is similar to the benchmark metric suggested by the commenter (*i.e.,* including both exchange and TRF trades), but is qualified by whether or not the NMLO or stop order is executable (not merely that it was in force). The Commission believes that by proposing to restrict the benchmark metric to only those NMLOs or stop orders that are executable would give a more realistic view of the opportunities available to that order. If a NMLO or stop order is never actually executable, inclusion of the order in the metrics could distort the overall view of a market center or broker-dealer's performance. When combined with execution information, the metric should provide information about how many trades executed while a NMLO or stop order could have been filled. This metric could then be combined with information on total executions in order to estimate a fill rate that is conditional on whether market prices reached levels at which NMLOs or stop order could have been filled (''conditional fill rate'').

For example, if a NMLO for 200 shares becomes executable and the tape reveals that subsequently 100 consolidated shares were executed at the NMLO's limit price, then the benchmark metric would be 100 shares. If a market center partially executed 50 shares of the NMLO, the conditional fill rate would be 50 shares/100 shares =

[435] *See* Minimum Pricing Increments Proposal.

[436] *See supra* section IV.B.1.

[437] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18729 (describing analysis that found, among other things, that in May 2020, ''40% of [odd-lot] transactions (representing approximately 35% of all odd-lot volume) occurred at a price better than the NBBO'').

[438] *See* Bartlett et al. (2022). The authors found that this percentage increases monotonically in the stock price, for example, for bid prices, increasing from 5% for the group of lowest-price stocks in their sample, to 42% for the group of highest-priced stocks.

[439] *See supra* section IV.B.2.

[440] *See* proposed Rule 605(a)(1)(i)(D) and (E) (for shares executed at the receiving market center or broker-dealer and shares executed away, respectively).

[441] Generally, ''regular way'' refers to bids, offers, and transactions that embody the standard terms and conditions of a market whereas a non-regular way transaction refers to one executed other than pursuant to standardized terms and conditions, such as a transaction that has extended settlement terms. *See, e.g.,* Regulation NMS Adopting Release, 70 FR 37496 (Jun. 29, 2005) at 37537 n.326.

[442] *See* FIF III, Appendix 1 at 8–10.

[443] *Id.*

50%.[444] If the market center does not execute the NMLO, the conditional fill rate would be 0 shares/100 shares = 0%.

On the other hand, if the tape reveals that 500 consolidated shares were executed at the 200-share NMLO's limit price subsequent to the limit order becoming executable, the benchmark metric would be capped at the order size to be 200 shares, since the market center would have been able to fully execute the 200-share order. If the NMLO executes, the conditional fill rate would be 200 shares/200 shares = 100%.[445] If the NMLO does not execute, the conditional fill rate would be 0 shares/200 shares = 0%. If the market center has two such NMLOs, one that executes and one that does not, the total conditional fill rate would be (0 + 200)/(200 + 200) = 50%.

Request for Comment

The Commission seeks comment generally on the reporting of certain information for beyond-the-midpoint limit orders, executable NMLOs, and executable orders with stop prices. In particular, the Commission solicits comment on the following:

43. Should market centers and broker-dealers be required to report the number of orders that received either a complete or partial fill? Why or why not?

44. Should the Commission also require these entities to report the cumulative number of shares executed regular way at prices that could have filled the order while the order was in force? Do commenters believe this statistic would provide a meaningful point of comparison for execution quality for non-marketable order types? Why or why not? Should the Commission require an alternative metric? Why or why not?

V. Proposed Summary Execution Quality Reports

Rule 605 requires market centers to prepare detailed execution quality statistics and, as required by the Rule 605 NMS Plan, make this data available via large electronic data files.[446] The required format for the reports makes them machine-readable and suitable for further processing and analysis.[447] However, the sheer number of rows needed to provide symbol-by-symbol data and the fact that human-readable formatting is not required means that Rule 605 reports are not readily usable by market participants and other interested parties that may prefer to review summary statistics, rather than conducting further analysis on the data. Furthermore, some market participants and other interested parties do not have access to software or possess programming skills necessary to conduct such analysis. Accordingly, the Commission is proposing to require all market centers and broker-dealers that are subject to Rule 605's reporting obligations to produce summary execution quality statistics, in addition to the more detailed reports required by Rule 605(a)(1).[448]

As recognized by several commenters to the 2018 Rule 606 Amendments, in recent years a working group associated with the Financial Information Forum[449] developed a standardized template that firms may use when publicly disclosing summary information about execution quality for retail investor orders in exchange-listed stocks (''FIF Template'').[450] Although the reports produced using the FIF Template may be useful, given that this disclosure is voluntary, only a few firms are making or have made such disclosures.[451] Commenters have suggested that the Commission require broker-dealers to produce a similar summary report.[452] For example, one commenter on the 2018 Rule 606 Amendments[453] stated that this proposal ''neglect[ed] to include any meaningful retail disclosure requirements relating to execution quality, either on a customer-specific or publicly aggregated basis,'' and that the type of disclosure provided in the FIF Template ''must be added to enable investors, third-party analysts, academic

[444] The unconditional fill rate (*i.e.,* the number of executed shares divided by the number of submitted shares) in this case would be 50 shares/200 shares = 25%, revealing that only a quarter of the NMLO was executed. The conditional fill rate adjusts for the fact that available market depth was insufficient to fill the entire order, and only compares the number of executed shares to the number of shares that are available at the limit price.

[445] Note that, if the metric were not capped at the order size, the conditional fill rate would be 200 shares/500 shares = 40%, which reflects that the order size was smaller than the cumulative number of shares executed during the NMLO's lifespan. Capping at the order size therefore will result in the metric only capturing whether broker-dealers were able to fill order sizes as given.

[446] *See* 17 CFR 242.605(a)(1) and (2); Rule 605 NMS Plan, at V and VI.

[447] *See* Rule 605 NMS Plan, at V (''Files shall be prepared in standard, pipe-delimited ('|') ASCII format and compressed using standard Zip compression.'').

[448] While current Rule 605 applies to market centers only, the Commission also is proposing to expand Rule 605's reporting obligations to broker-dealers, subject to a customer account threshold for reporting. *See supra* section III.A. Requiring broker-dealers to produce summary reports would align those entities that would be required to produce detailed execution quality statistics with those entities that would be required to produce the summary reports.

[449] According to the Financial Information Forum, the organization was formed in 1996 to provide a centralized source of information on the implementation issues that impact financial services and technology firms, and its participants include trading and back office service bureaus, broker-dealers, market data vendors, and exchanges. *See* FIF II at 1 n.1.

[450] *See* Financial Services Roundtable Letter at 4 (stating that the Financial Information Forum has established a Rule 605/606 working group that has sought to improve the execution quality statistics for retail investors and that the FIF Template includes order size, average order size, shares executed at the market quote or better, price improvement percentage, average savings per order, and execution speed); Fidelity Letter at 8 (identifying the commenter as one of the few firms that voluntarily publishes these industry-standardized statistics); IHS Markit Letter at 30 (stating that the introduction of voluntary reporting of execution quality metrics, under the auspices of the Financial Information Forum, has demonstrated improvement in execution quality). *See also* Financial Information Forum, Retail Execution Quality Statistics, *available at https://fif.com/tools/retail-execution-quality-statistics.*

[451] *See* EMSAC I at 0099:10–12 (Bill Alpert, Barron's) (''These are selective disclosures. Only a few brokers and market makers are making them, so a mandate would be nice.''); Healthy Markets I at 7 n.17 (stating that this information provided is ''incredibly valuable,'' even if participation is very limited, with just three retail brokers and three wholesale market-making firms providing data). *See also infra* notes 553–555 and accompanying text (discussing the limited number of firms that have produced reports utilizing the FIF Template at various points in time).

[452] *See* Healthy Markets I at 7 (suggesting that the Commission mandate at least the same level of disclosure for retail orders as was provided pursuant to the FIF Template); Fidelity Letter at 7–8 (suggesting that the Commission require brokers to make publicly available on their website execution statistics, such as price improvement, execution price, execution speed, and effective spread); Financial Services Forum at 5 (stating that although the disclosed metrics do not have to mirror the FIF Template, the Commission should consider requiring similar metrics that are output driven). *See also* Fidelity Letter at 9 (stating that dividing data between S&P 500 stocks and other exchange-listed stocks is a standard metric that is used to break down execution quality statistics in the FIF Template).

[453] Rule 606(b)(1) requires broker-dealers to produce to customers, upon request, a human-readable report with high-level customer-specific order routing information, but these reports do not contain any execution quality information. *See supra* note 54 and accompanying text. Although the 2018 Rule 606 Amendments modified the orders covered by Rule 606(b)(1), the required disclosures under Rule 606(b)(1) did not change. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58340 n.24.

[454] Consumer Federation II at 1 (suggesting that the Commission add to the FIF Template information about the NBBO at the time a marketable order is received, the NBBO at the time the order is executed, and any difference between them, and stating that these metrics would give additional information about whether any delays in routing and execution affect the ultimate price the investor pays). *See also* Angel Letter at 3–7 (suggesting that brokerage firms be required to display summary execution quality statistics on their websites, providing several alternative formats as samples, and suggesting that the statistics include information about the number of customer complaints received); Angel Letter at 2 (stating that the Rule 605 reports are too raw for most investors and few investors have the expertise to interpret the reports).

researchers, and regulators to examine the extent to which retail brokers are best serving their clients.'' [454]

When adopting Rule 605, the Commission made a decision to require market centers to produce detailed reports in order to avoid the dangers of overly general statistics.[455] The Commission stated that ''[a]ssigning a single 'execution quality' score to market centers, for example, would hide major differences in execution quality, potentially creating far more problems than it solved.'' [456] The large volume of statistical data in the Rule 605 reports allows market participants and other interested parties to select the order characteristics that they find are most appropriate to use to compare execution quality, and their ability to conduct analyses would be enhanced by the modifications to Rule 605 proposed herein.[457] Yet many commenters have observed that also requiring firms to produce summary reports of the voluminous Rule 605 statistics would be useful,[458] and some market centers have voluntarily posted summary statistics based on the detailed execution quality statistics in their Rule 605 reports.[459] These voluntary reports have some utility, but the practice of producing summary statistics is not uniform and, even where summary statistics are provided, different formats may inhibit comparisons across firms.

Requiring market centers and broker-dealers to produce summary execution quality reports, in addition to the more detailed reports, would allow market participants and other interested parties to have more ready access to high-level data that would allow them to compare some of the more significant aspects of the execution quality provided by specific market centers and broker-dealers. In particular, it is currently challenging for individual investors to use Rule 605 reports, and these individual investors would be more readily able to use a summary report to make a more informed choice than they can currently about selection of a broker-dealer. Because these reports would be human-readable, individual investors could assess the data by reviewing and comparing summary reports without needing technical expertise or relying on an intermediary. The proposed summary reports would contain significantly more detail than a ''single 'execution quality' score'' [460] and thus would contain quantitative data for interested parties to assess, rather than imposing a single metric that might require a subjective judgement or obscure meaningful differences about a market center's or broker-dealer's execution quality. Moreover, by requiring reporting entities to produce summary reports in addition to, rather than instead of, the more detailed statistics called for by the current Rule, those market participants or other observers that would like to perform a more detailed or specific analysis would be able to download the more granular underlying data files and perform such analysis.[461]

Proposed Rule 605(a)(2) would require every market center, broker, or dealer to make publicly available for each calendar month a report providing summary statistics on all executions of covered orders that are market and marketable limit orders that it received for execution from any person.[462] Individual investors trading NMS stocks primarily use marketable orders (including market orders and marketable limit orders) that seek to trade immediately at the best available price in the market. Individual investors would be the most likely consumers of the summary reports, and therefore it would provide significant benefit for the summary reports to cover the types of orders that individual investors use most frequently.[463] Other order types, such as NMLOs, would not be included in the summary reports because including these types of orders would increase the amount of information contained in the summary report, and thus detract from its summary nature, and the summary execution quality information about these types of orders would be less likely to be useful to individual investors. In addition to representing a smaller share of trades by individual investors, a significant risk of including NMLOs is that they may be more likely to not be executed during the time period that they are executable and have a time lag before they become executable again, and therefore it would become more difficult to assess other aspects of execution quality, particularly at an aggregate level.

The proposed summary report would include a section for NMS stocks that are included in the S&P 500 Index as of the first day of the month and a section for other NMS stocks.[464] Rule 606(a)(1) similarly separates the required quarterly report on order routing into a section for securities that are included in the S&P 500 Index and a section for other NMS stocks.[465] When adding this provision to Rule 606 in the 2018 Rule 606 Amendments, the Commission stated that the handling of NMS stocks may vary based on their market capitalization value and trading volume, and thus customers that place held orders could benefit from a delineation based on the S&P 500 Index.[466] The same reasoning applies to the proposed summary reports pertaining to execution quality statistics under Rule 605. Moreover, within each section, each symbol would be equally weighted based on share volume.[467] Equal weighting of each symbol would facilitate the comparability of execution quality statistics among market centers or broker-dealers that receive for execution different mixes of stocks and prevent the nature of the stocks traded from making it more difficult to determine how the reporting entity performed with respect to execution quality for the particular mix of orders that it received for execution.[468] Further, equal weighting by share volume could be calculated using data collected to produce the Rule 605(a)(1) reports and would not require the collection of additional data.

Each section of the report would include, for market orders and marketable limit orders, the following

[455] *See supra* note 161 and accompanying text.

[456] Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419.

[457] *See supra* note 164 and accompanying text.

[458] *See supra* notes 134–135 and 452–454 and accompanying text.

[459] *See supra* notes 450–454 and accompanying text.

[460] *See supra* note 456 and accompanying text.

[461] Those market participants or other observers that perform their own analyses using data from Rule 605 reports might find it useful also to review firms' summary reports to obtain quick access to an overview of the data or assess information outside the scope of their own data analyses. Conversely, even if consumers of the summary reports do not review the more detailed Rule 605 data themselves, they might benefit from the detailed Rule 605 reports if independent analysts, consultants, broker-dealers, the financial press, and market centers analyze the disclosures and produce more digestible information using the data, which analysis might include details not present in the summary reports.

[462] *See* proposed Rule 605(a)(2).

[463] Similarly, the FIF Template covers standard market orders. *See* Fidelity Brokerage Services LLC, Retail Execution Quality Statistics, *available at https://www.fidelity.com/bin-public/060_www_fidelity_com/documents/FIF-FBS-retail-execution-quality-stats.pdf. But see* Angel Letter, at 7 (recommending summary statistics specific to NMLOs).

[464] *See* proposed Rule 605(a)(2).

[465] *See* 17 CFR 242.606(a)(1). The FIF Template also segregates the reported execution quality statistics based on whether or not the securities are in the S&P 500 Index, and one commenter stated that this is a standard metric. *See supra* note 452.

[466] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58378.

[467] *See* proposed Rule 605(a)(2).

[468] For example, without equal weighting, differences in summary-level execution quality statistics between a market center that receives more high-priced stocks for execution and market center that receives more low-priced stocks for execution may be more attributable to the different mix of stocks, rather than differences in the behavior of the market center.

summary statistics for executed orders: (i) the average order size; (ii) the percentage of shares executed at the quote or better; (iii) the percentage of shares that received price improvement; (iv) the average percentage price improvement per order; (v) the average percentage effective spread; (vi) the average effective over quoted spread, expressed as a percentage; and (vii) the average execution speed, in milliseconds.[469] Together, the proposed summary-level statistics are intended to provide an overview of price-based information and execution speed. The Commission notes that these categories of statistics are very similar to those used in the FIF Template, and that both the summary statistics in proposed Rule 605(a)(2) and the statistics reflected in the FIF Template focus on statistics that are most relevant to evaluating what type of pricing orders received and how quickly orders were executed.[470] The proposed summary report would include average percentage of price improvement per order, average percentage effective spread, and average E/Q, expressed as a percentage, whereas the FIF Template includes average savings per order, expressed in dollars. The three statistics that would be in the proposed summary report each provide a different view of the pricing provided to orders, and, if anything, provide a more robust picture of this pricing than the single metric in the FIF Template. For example, average effective spread is a comprehensive statistic that is a useful single measure of the overall liquidity premium paid by those submitting orders for execution.[471]

The Commission is proposing to require that the summary reports must be made available using the most recent version of the XML schema and the associated PDF renderer published on the Commission's website.[472] The requirement to use the Commission's XML schema is intended to ensure that the data is provided in a format that is structured and machine-readable, and this would allow users to more easily process and analyze the data, as well as provide consistency of format across reports. Further, the requirement that the same data should be provided through the use of a PDF renderer is intended to ensure that the reports are also available in a human-readable format and consistently presented across reports. A human-readable format would be a format that can be naturally read by an individual. Preparing reports in a human-readable format allows users that prefer only to review individual reports, and not necessarily aggregate or conduct large-scale data analysis on the data, to access the data easily. The Commission notes that Rule 606 similarly provides that the required reports on order routing shall be made available using the most recent versions of the Commission's XML schema and associated PDF renderer.[473] In addition, although the FIF Template is a general template and does not specify a particular format for the reports, market participants choose to voluntarily prepare reports using the FIF Template. The number of reporting entities that would be required to prepare summary reports under proposed Rule 605(a)(2) would be much greater than the number of entities that have chosen to produce reports voluntarily using the FIF Template, and requiring a uniform format would facilitate users' ability to compare information across reports.

Rule 605 requires every national securities exchange on which NMS stocks are traded and each national securities association to act jointly in establishing procedures for market centers to make the reports required by Rule 605(a)(1) available to the public in a uniform, readily accessible, and usable electronic form.[474] The Commission is proposing to amend this provision, which would be reorganized into proposed Rule 605(a)(3), so that the proposed summary reports would also be made available in accordance with the procedures established by the Plan.[475] Rule 605 also specifies that the detailed reports required by Rule 605(a)(1) must be posted on an internet website that is free and readily accessible to the public for a period of three years from the initial date of posting.[476] As proposed, these same requirements would be reorganized into proposed Rule 605(a)(5) and would be extended to the summary reports for the same reasons expressed when these requirements were adopted for the Rule 605(a)(1) reports and because it would be useful to users of the reports for the Rule 605(a)(1) reports and proposed

[469] *See* proposed Rule 605(a)(2)(i)–(vii).

[470] *See supra* note 450 and accompanying text. The categories in the FIF Template for average order size (shares); shares executed at current market quote or better (%); price improvement (%); and average execution speed (seconds) appear to be directly comparable to the categories in proposed Rule 605(a)(2) for the average order size, the percentage of shares executed at the quote or better, the percentage of shares that received price improvement, and the average execution speed, in milliseconds. Moreover, the proposed use of milliseconds, rather than seconds, to measure average execution speed is consistent with proposed changes to the timestamp conventions, as discussed above. *See supra* section IV.B.3.

[471] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75424. The statistics proposed to be included in the summary report are also generally consistent with commenters' suggestions that the summary report either follow the FIF Template or provide similar metrics. *See supra* notes 452–454 and accompanying text. One commenter suggested that the summary report include information about the NBBO at the time of order receipt and at the time of order execution to give information about whether delays in routing and execution affect the execution price. *See supra* note 454. This effect would likely also be evident in the average effective spread and average E/Q.

[472] *See* proposed Rule 605(a)(2). The Commission's schema would be a set of custom XML tags and XML restrictions designed by the Commission to reflect the disclosures in proposed Rule 605(a)(2). XML enables data to be defined, or ''tagged,'' using standard definitions. The tags establish a consistent structure of identity and context. This consistent structure can be automatically recognized and processed by a variety of software applications, such as databases, financial reporting systems, and spreadsheets, and then made immediately available to the end-user to search, aggregate, compare, and analyze. In addition, the XML schema could be easily updated to reflect any changes to the open standard. XML and PDF are ''open standards,'' which is a term that is generally applied to technological specifications that are widely available to the public, royalty-free, at no cost.

[473] *See* 17 CFR 242.606(a)(1), (b)(1)(iii), and (b)(3). When adopting the 2018 Rule 606 Amendments, the Commission stated that the XML schema was designed to ensure that the data is provided in an XML format that is structured and machine-readable, so that the data can be more easily processed and analyzed, and that by requiring use of the associated PDF renderer, the XML data would be instantly presentable in a human-readable PDF format and consistently presented across reports. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58364. The Commission shares the same goals in proposing that the Rule 605(a)(2) reports be produced according to an XML schema and associated PDF renderer.

[474] *See* 17 CFR 242.605(a)(2). As discussed above, the Commission is proposing to expand this requirement, and the other procedural requirements in proposed Rule 605(a)(2) and (3), to cover broker-dealers. *See supra* note 155 and accompanying text.

[475] *See* proposed Rule 605(a)(3). Among other things, the Plan requires each market center to arrange with a single plan participant to act as the market center's Designated Participant. *See* Plan, at section VIII. Inclusion of proposed Rule 605(a)(2)'s summary reports within the scope of the Plan would promote consistent administration of Rule 605 and allow the Designated Participant for each reporting entity to play a role with respect to the reports required by Rule 605(a)(1) and proposed Rule 605(a)(2). The Plan also establishes the formats and fields for the reports currently required under Rule 605(a)(1). Because proposed Rule 605(a)(2) requires the use of the Commission's XML schema and associated PDF renderer, the Plan would not establish the formats and fields for the summary reports. Further, as proposed, the existing provision that states that, in the event there is no effective market system plan, market centers shall prepare their reports in a consistent, usable, and machine-readable electronic format and make such reports available for downloading from an internet website that is free and readily accessible to the public would be reorganized as proposed Rule 605(a)(4) and modified to explicitly refer to the requirements in Rule 605(a)(1). *See* proposed Rule 605(a)(4). As proposed, this provision would not apply to the summary reports that would be required by proposed Rule 605(a)(2). The proposed summary reports would not need to be included in proposed Rule 605(a)(4) because the XML schema and associated PDF renderer would specify the necessary format for the reports and proposed Rule 605(a)(5) would contain the requirement for internet posting.

[476] 17 CFR 242.605(a)(2).

Rule 605(a)(2) reports to be available for the same period of time.[477]

Further, Rule 605 specifies that the detailed reports required by Rule 605(a)(1) must be made available within one month after the end of the month addressed in the report.[478] The Commission is proposing to renumber this provision as proposed Rule 605(a)(6) and to extend this requirement to the Rule 605(a)(2) reports.[479] The Commission believes that firms could produce the proposed Rule 605(a)(2) report alongside the Rule 605(a)(1) report, which must be produced monthly, because both reports are based on the same underlying data. Additionally, it would be useful for users of the reports to have access to the detailed reports and summary reports at the same time so that they could review the aggregated data in the summary reports and then conduct further analysis using the detailed reports, as needed.

Request for Comment

The Commission seeks comment generally on the proposed requirement that market centers and brokers-dealers that are required to produce detailed execution quality statistics also provide a summary report. In particular, the Commission solicits comment on the following:

45. Should a market center or broker-dealer that is subject to Rule 605's reporting requirement be required to also provide a summary report reflecting aggregated execution quality information? Why or why not? Do commenters agree that summary reports would make execution quality information more accessible to individual investors? Please explain.

46. Should the summary report be required to be divided into separate categories according to whether or not securities are included in the S&P 500 Index? Why or why not? Are there any alternative means to group securities that have higher market capitalization or trading volume that should be required to be used to organize the summary statistics, instead of or in addition to dividing the securities included in the report according to whether or not they are included in the S&P 500 Index? Should the summary report include order size categories? Why or why not? Please explain and provide data, if available.

47. Should stocks be required to be equally weighted by symbol based on share volume within each section? Why or why not? Is there another method of weighting the stocks that would be preferable (*e.g.,* equal weighting by symbol based on dollar volume or applying a common weighting scheme across securities)? Please explain.

48. Should the summary report be limited to covered orders that are market or marketable limit orders? Why or why not? Would it be preferable to include other specific categories of covered orders (*i.e.,* marketable IOCs, beyond-the-midpoint limit orders, executable NMLOs, executable orders with stop prices) or to include all covered orders? Do commenters agree with the proposed aggregated statistics to include in the summary report? Are there any aggregated statistics that commenters would eliminate? Are there any execution quality statistics that would be required pursuant to proposed Rule 605(a)(1) for which commenters would add corresponding aggregated statistics to the summary report? Please explain.

49. Should the summary reports be required to be made available using the most recent version of an XML schema and an associated PDF renderer as published by the Commission? Why or why not? Is there an alternative, machine-readable and/or human-readable format, that would be preferable? Would it be preferable for the Plan to establish the required format, including an associated schema, for the summary reports?

50. Should the Commission require that summary Rule 605 reports be posted in a centralized location? Alternatively, should the Commission require both summary and detailed reports to be posted in a centralized location? Why or why not? Do commenters have a view on how centralized posting could be implemented? Are there other ways the Commission could improve the accessibility of the reports?

VI. Paperwork Reduction Act

Certain provisions of the proposed rule amendments contain ''collection of information'' requirements within the meaning of the Paperwork Reduction Act of 1995 (''PRA'').[480] The Commission is submitting these collections of information to the Office of Management and Budget (''OMB'') for review in accordance with 44 U.S.C. 3507(d) and 5 CFR 1320.11. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the agency displays a currently valid control number. The Commission is proposing to alter an existing collection of information and apply such collection of information to new categories of respondents. The title of such existing collection of information is: Rule 605 of Regulation NMS (f/k/a Rule 11Ac1–5).[481]

A. Summary of Collection of Information

The proposed amendments create burdens under the PRA by: (1) adding new categories of respondents to the existing collection of information and (2) modifying the requirements of such existing collection of information. The proposed amendments do not create any new collections of information.

The categories of new respondents subject to Rule 605, as proposed to be amended, are larger broker-dealers and new market centers, consisting of SDPs and entities that would operate proposed qualified auctions or act as market centers for orders that were previously not covered by the Rule, *e.g.,* fractional share orders.

The proposed amendments would modify both the scope of the standardized monthly reports required under Rule 605 and the required information. Rule 605, as proposed to be amended: (1) expands the definition of ''covered order'' to include certain orders submitted outside of regular trading hours, certain orders submitted with stop prices, and non-exempt short sale orders; (2) modifies the existing order size categories to base them on round lots rather than number of shares and includes additional order size categories for fractional share, odd-lot, and larger-sized orders; (3) creates a new order type category for marketable IOCs and replaces three existing categories of non-marketable order types with three new categories of order types (beyond-the-midpoint limit orders, executable NMLOs, and executable orders with stop prices); (4) eliminates current time-to-execution reporting buckets and requires average time to execution, median time to execution, and 99th percentile time to execution, each as measured in increments of a

[477] *See* proposed Rule 605(a)(5). *See also* 2018 Rule 606 Amendments Release, 83 FR at 58380 (stating that the requirement to keep Rule 605(a)(1) reports posted on a website that is free and readily accessible for three years is appropriate because a three-year retention period is consistent with the requirement under Rule 17a–4(b) that broker-dealers preserve certain documents for a period of not less than three years; the reports will be useful and not lead to misleading analyses because the Commission expects customers and the public to use historical information to compare information from the same time period; and the public information will provide a historical record of a market center's order execution information).

[478] 17 CFR 242.605(a)(3).

[479] *See* proposed Rule 605(a)(6).

[480] 44 U.S.C. 3501 *et seq.*

[481] OMB Control Number 3235–0542.

millisecond or finer; (5) modifies realized spread statistics to require realized spread to be calculated after 15 seconds and one minute; and (6) requires new statistical measures of execution quality including average effective over quoted spread, percentage effective and realized spread statistics, a size improvement benchmark, and certain statistical measures that could be used to measure execution quality of NMLOs. The proposed amendments would require all reporting entities to make a summary report available that would be formatted in the most recent versions of the XML schema and the associated PDF renderer as published on the Commission's website. Finally, as a result of the proposed amendments to Rule 605, the current Rule 605 NMS Plan participants would need to amend the NMS Plan to account for the new proposed data fields.

B. Proposed Use of Information

The purpose of the information collection is to make information about order execution practices available to the public and allow investors, broker-dealers, and market centers (which include exchange markets, OTC market makers, and ATSs) [482] to undertake a comparative analysis of these practices across markets. Broker-dealers may use the information to make more informed choices in deciding where to route orders for execution and to evaluate their internal order handling practices. Investors may use the information to evaluate the order handling practices of their broker-dealers. Market centers may use the information to compete on the basis of execution quality.

C. Respondents

The collection of information obligations of Rule 605 apply to larger broker-dealers and market centers that receive covered orders in national market system securities (collectively, ''reporting entities''). The Commission estimates that there are currently approximately 236 reporting entities (93 OTC market makers, plus 16 national securities exchanges, 1 national securities association, 94 exchange market makers, and 32 ATSs).[483] However, under the proposed amendments, the Commission believes there would be 359 reporting entities (93 OTC market makers, 85 broker-dealers that introduce or carry 100,000 or more customer accounts,[484] 16 national securities exchanges, 1 national securities association, 94 exchange market makers, 32 ATSs,[485] plus 38 new market center respondents [486]) that would be subject to the collection of information obligations of Rule 605. Each of these respondents would be required to respond to the collection of information on a monthly basis.

In addition, the proposed amendments to Rule 605 would require the existing NMS Plan participants (16 national securities exchanges and 1 national securities association) to prepare and file an amendment to the existing NMS Plan.

D. Total PRA Burdens

As proposed, Rule 605 would require broker-dealers and market centers to make available to the public monthly order execution reports in electronic form. The Commission believes that broker-dealers and market centers retain most, if not all, of the underlying raw data necessary to generate these reports in electronic format or, if they do not, may obtain this information from publicly available data sources.[487] Consequently, the Rule would not require additional data collection or recordkeeping burdens. Respondents could either program their systems to generate the statistics and reports, or transfer the data to a service provider (such as an independent company in the business of preparing such reports or an SRO) that would generate the statistics and reports.

The Commission estimates that the initial and ongoing burdens would be different for those respondents that are currently required to prepare reports and for new respondents. The Commission estimates that proposed Rule 605 amendments would result in an initial burden for current respondents of 50 hours per respondent [488] for systems updates to ensure that data responsive to the amended requirements is correctly collected and formatted. The initial burden estimate represents the work that would need to be done by existing respondents to modify their systems to collect data required under the proposed amendments to Rule 605 and generate the monthly reports. The estimate includes time required to program and test automated systems to collect the necessary data, as well as review and approval by compliance personnel. The Commission does not believe the information required to be aggregated and included in Rule 605 reports, as proposed to be amended, would require existing respondents to acquire new hardware or systems to process the information required in the reports. The Commission further estimates that the proposed Rule 605 amendments would result in an ongoing monthly burden of 8 hours per respondent to collect the necessary data and to prepare the required Rule 605 reports, for a total annual burden of 96 hours per respondent.[489] This estimate represents the time that would be required to verify automated processes are functioning as intended and post and prepare the required reports, or transfer data to a service provider to generate the reports.[490] With an

[482] *See* 17 CFR 242.600(b)(46).

[483] The current PRA for Rule 605 estimates 319 reporting entities (153 OTC market makers, plus 24 exchanges, 1 securities association, 80 exchange market makers, and 61 ATSs). Based on updated estimates of the number of respondents, the Commission estimates that there are only 236 current reporting entities.

[484] These 85 brokers-dealers include 37 broker-dealers that act as introducing brokers.

[485] As of September 30, 2022, there are 32 NMS Stock ATSs that have filed an effective Form ATS–N with the Commission.

[486] These 38 new market center respondents would consist of 20 market centers that would need to produce reports as a result of including fractional share orders within the scope of Rule 605, 10 SDPs, and 8 qualified auctions.

[487] National securities exchanges, national securities associations, and registered brokers and dealers are subject to existing recordkeeping and retention requirements including Rule 17a–1 (for self-regulatory organizations (''SROs'')); Rules 17a–3 and 17a–4 (for broker-dealers). *See* 17 CFR 240.17a–1, 17 CFR 240.17a–3, and 17 CFR 240.17a–4. The Commission's estimates include the Rule's requirement that reporting market centers and broker-dealers keep Rule 605 reports posted on an internet website that is free and readily accessible to the public for a period of three years from the initial date of posting on the internet website. *See* proposed Rule 605(a)(5).

[488] The Commission believes the monetized initial burden for this requirement to be $4,368,360. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(Sr. Programmer at $368 for 25 hours) + (Sr. Systems Analyst at $316 for 10 hours) + (Compliance Manager at $344 for 10 hours) + (Director of Compliance at $542 for 5 hours)] = $18,510 per respondent for a total initial monetized burden of $4,368,360 ($18,510 × 236 respondents).

[489] The Commission believes the monetized annual burden for this requirement to be $8,847,168. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(((Compliance Attorney at $406 for 6 hours) + (Compliance Manager at $344 for 2 hours)) × 12 reports per year] = $37,488 per respondent for a total annual monetized burden of $8,847,168 ($37,488 × 236 respondents).

[490] The Commission's currently approved PRA for Rule 605 (OMB Control Number 3235–0542), last updated in April 2022, estimates that current respondents each will spend 6 hours per month to collect the data necessary to generate the reports, or 72 hours per year. Although the proposed amendments to Rule 605 would require additional data fields and the generation of summary reports, the Commission believes the data collection and

estimated 236 respondents currently subject to Rule 605, the total initial burden to comply with the Rule 605 amendments is estimated to be 11,800 hours while the monthly reporting requirement is estimated to be 22,656 hours per year (236 × 96). The burdens for respondents currently reporting under Rule 605 are likely to be lower than those of new reporting entities because currently-reporting entities already have systems in place to collect the data necessary to generate reports under the current Rule. These estimates include the impact of preparing and making summary reports available using the most recent versions of the XML schema and the associated PDF renderer as published on the Commission's website.

The Commission estimates that proposed Rule 605 amendments would result in an initial burden for new respondents of 100 hours for each respondent [491] for systems updates to ensure that data responsive to the amended requirements is correctly gathered and formatted. This burden is higher than the estimated burden for current respondents because new respondents do not currently have in place the systems to collect the information required for current Rule 605 reports. These respondents would likely require additional time to collect the relevant information. In addition, this estimate includes additional time for programming and testing automated systems to collect the necessary data and additional hours for review and approval by compliance personnel. Once the relevant data is collected, respondents could either program their systems to generate the reports, or transfer the data to a service provider that would generate the reports. Respondents would likely not be required to acquire new hardware or other technological resources to be able to collect the data required by the proposed rule given that respondents would already have computing systems in place to, for example, transmit and process order information, and such systems could be leveraged to collect the required data. Further, to the extent a respondent does not have the technological capabilities or resources to generate the reports in-house, such respondents would likely utilize a service provider, as discussed below. The Commission estimates that the proposed Rule 605 amendments would result in an ongoing monthly burden of 8 hours to collect the necessary data and to prepare the required Rule 605 reports, for a total annual burden of 96 hours per respondent. [492] With an estimated 123 new respondents subject to Rule 605, the total initial burden to comply with the Rule 605 amendments is estimated to be 12,300 hours while the monthly reporting requirement is estimated to be 11,808 hours per year (123 × 96). These estimates include the impact of preparing and making summary reports available using the most recent versions of the XML schema and the associated PDF renderer as published on the Commission's website.

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Table 2—Respondent Burdens for Producing Rule 605 Reports

report generation process should be an automated process that would not require substantial additional burden hours after initial set-up.

[491] The Commission believes the monetized initial burden for this requirement to be $4,553,460. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(Sr. Programmer at $368 for 50 hours) + (Sr. Systems Analyst at $316 for 20 hours) + (Compliance Manager at $344 for 20 hours) + (Director of Compliance at $542 for 10 hours)] = $37,020 per respondent for a total initial monetized burden of $4,553,460 ($37,020 × 123 respondents).

[492] The Commission believes the monetized annual burden for this requirement to be $4,611,024. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [((Compliance Attorney at $406 for 6 hours) + (Compliance Manager at $344 for 2 hours)) × 12 reports per year] = $37,488 per respondent for a total annual monetized burden of $4,611,024 ($37,488 × 123 respondents).

Respondent Type	Number of Respondents	Burden Type	Burden per Respondent (Hours)	Annual Responses	Total Burden Hours (Number of Respondents x Burden per Respondent)[493]
OTC Market Makers	93	Initial	50		4,650
		Annual	8	12	8,928
Exchange Market Makers	94	Initial	50		4,700
		Annual	8	12	9,024
Exchanges	16	Initial	50		800
		Annual	8	12	1,536
Associations	1	Initial	50		50
		Annual	8	12	96
ATSs	32	Initial	50		1,600
		Annual	8	12	3,072
Totals for Current Respondents	**236**	**Initial**	**50**		**11,800**
		Annual	**8**	**12**	**22,656**
Broker-Dealers with ≥100,000 customer accounts	85	Initial	100		8,500
		Annual	8	12	7,140
Non-market center broker-dealers	20	Initial	100		2,000
		Annual	8	12	1,680
SDPs	10	Initial	100		1,000
		Annual	8	12	840
Qualified Auctions	8	Initial	100		800
		Annual	8	12	672
Total Burden for New Respondents	**123**	**Initial**	**100**		**12,300**
		Annual	**8**	**12**	**11,808**

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The Commission estimates that in lieu[493] of preparing both summary and detailed monthly reports in-house, an individual respondent could retain a service provider to prepare its monthly reports for between approximately $3,000 and $3,500 per month or approximately $36,000 to $42,000 per year.[494] This per-respondent estimate is based on the rate that a reporting entity could expect to obtain if it negotiated on an individual basis. Based on the $3,000 to $3,500 estimate, the monthly cost to the 359 respondents to retain service providers to prepare reports would be between approximately $1,077,000 and $1,256,000 ((359 × $3,000) and (359 × $3,500), respectively), or a total annual cost of between approximately $12,924,000 and $15,078,000 (($1,077,000 × 12) and ($1,256,000 × 12), respectively).

Finally, the 16 national securities exchanges and 1 national securities association would be required to amend the NMS Plan to account for the new data fields required to be reported and to include references to larger broker-dealers in addition to market centers. The Commission estimates that there would be a one-time (or initial) burden of 5 hours per respondent[495] to amend the NMS Plan to account for the new reporting fields and reporting parties, for a total burden of 85 hours (17 × 5). The Commission does not estimate that there would be any ongoing annual burden associated with the NMS Plan amendment to account for the new reporting fields and reporting parties. The Commission has based its estimate of SRO burden hours to amend the NMS Plan on the burden hours for existing NMS plans, while also taking into account the limited nature of the updates to the NMS Plan that would be required under the proposed amendments to Rule 605.

The Commission estimates that there would be outsourcing of legal time to develop and draft the NMS Plan amendment in order to account for additional data fields and reporting parties. The NMS Plan amendment would be an update to the list of formats and fields to track the data elements set forth in the Rule and add references to broker-dealers subject to the Rule, and therefore the Commission estimates the hours necessary to develop and draft the amendment would be significantly lower than other recent NMS plan amendments. The Commission staff estimates that, on average, each exchange and association would outsource 2 hours of legal time to prepare and file an amendment to the NMS Plan, at an average hourly rate of $496.[496] The Commission estimates that the aggregate one-time reporting burden for preparing and filing an amendment to the NMS Plan would be approximately $992 in external costs per national securities exchange or national securities association, for an aggregate external cost of $16,864 resulting from outsourced legal work [(2 hours @$ $496 per hour = $992) × (16 national securities exchanges and 1 national securities association)].

The Commission currently estimates a total initial burden of 24,169 hours for all respondents and a total annual burden of 34,368 hours for all respondents.[497]

E. Request for Comment

Pursuant to 44 U.S.C. 3506(c)(2)(B), the Commission solicits comments to:

51. Evaluate whether the proposed collection of information is necessary for the proper performance of the Commission's functions, including whether the information shall have practical utility;

52. Evaluate the accuracy of the Commission's estimates of the burden of the proposed collection of information;

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

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

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

Persons submitting comments on the collection of information requirements should direct them to the Office of Management and Budget, Attention: Desk Officer for the Securities and Exchange Commission, Office of Information and Regulatory Affairs, Washington, DC 20503, and should also send a copy of their comments to Secretary, Securities and Exchange Commission, 100 F Street NE, Washington, DC 20549–1090, with reference to File Number S7–29–22. Requests for materials submitted to OMB by the Commission with regard to this collection of information should be in writing, with reference to File Number S7–29–22 and be submitted to the Securities and Exchange Commission, Office of FOIA/PA Services, 100 F Street NE, Washington, DC 20549–2736. As OMB is required to make a decision concerning the collection of information between 30 and 60 days after publication, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication.

VII. Economic Analysis

A. Introduction

The Commission is mindful of the economic effects that may result from the proposed amendments, including the benefits, costs, and the effects on efficiency, competition, and capital formation.[498] The following economic analysis identifies and considers the costs and benefits—including the effects on efficiency, competition, and capital formation—that could result from the proposed amendments to Rule 605.

When the Commission adopted Rule 11Ac1–5, which was later re-designated as Rule 605, in 2000, it stated that the

[493] In the case of annual burdens, the burden per respondent is the burden hours multiplied by the number of responses per year.

[494] The Commission's currently approved PRA for Rule 605 estimates that the retention of a service provider to prepare a monthly report would cost $2,978 per month, or approximately $35,736 per year. Although the individual line items required by the Rule 605 amendments would be different than the current Rule, the Commission does not believe that the overall cost of creating the required reports would differ substantially from these current estimates.

[495] The Commission believes the monetized initial burden for this requirement to be $40,222. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(Attorney at $462 for 4 hours) + (Assistant General Counsel at $518 for 1 hour)] = $2,366 per respondent for a total initial monetized burden of $40,222 ($2,366 × 17 respondents).

[496] The Commission's estimates of the relevant wage rates for outside legal services takes into account staff experience, a variety of sources including general information websites, and adjustments for inflation.

[497] (11,800 + 12,300 + 119) = 24,219 initial burden hours. (22,656 + 11,808) = 34,464 annual burden hours. The Commission estimates the monetized initial burden for all respondents to be $8,978,906 ($4,368,360 + $4,553,460 + $57,086) and the monetized annual burden for all respondents to be $13,458,192 ($8,847,168 + $4,611,024).

[498] Exchange Act section 3(f) requires the Commission, when it is engaged in rulemaking pursuant to the Exchange Act and is required to consider or determine whether an action is necessary or appropriate in the public interest, to consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation. *See* 15 U.S.C. 78c(f). In addition, Exchange Act section 23(a)(2) requires the Commission, when making rules pursuant to the Exchange Act, to consider among other matters the impact that any such rule will have on competition and not to adopt any rule that would impose a burden on competition that is not necessary or appropriate in furtherance of the purposes of the Exchange Act. *See* 15 U.S.C. 78w(a)(2).

rule should facilitate comparisons across market centers and provoke more vigorous competition on execution quality and broker-dealer order routing performance.[499] However, under current Rule 605 reporting requirements, variations across broker-dealers in terms of the execution quality achieved by their order routing services are not currently observable by market participants using publicly available execution quality reports. Furthermore, in the subsequent decades, substantial changes in equity markets, including increases in trading speeds and fragmentation, have made it so that Rule 605 reports are less informative than they were when the Rule was adopted. Furthermore, the Commission believes that the proposed amendments to Rule 605, including expanding the scope of reporting entities, modernizing its content, and broadening its accessibility, would increase the relevance and use of the information contained in Rule 605 reports, and promote competition among market centers and broker-dealers. This increase in competition would ultimately lead to improved execution quality for investors.

The Commission recognizes that the proposed amendments would entail additional costs to market centers and broker-dealers of disclosing the required execution quality information. Market centers would face initial compliance costs when updating their methods for preparing Rule 605 reports, and broker-dealers that were previously not required to publish Rule 605 reports would face initial compliance costs, including but not limited to developing the systems and processes and organizing the resources necessary to generate the reports pursuant to Rule 605, and ongoing compliance costs to continue to publish Rule 605 reports each month.

The Commission has considered and is describing the economic effects of the proposed amendments to Rule 605 and wherever possible has quantified the likely economic effects of the proposed amendments. The Commission has incorporated data and other information, such as academic literature, to assist in the analysis of the economic effects of the proposal. However, because the Commission does not have, and in certain cases does not believe that it can reasonably obtain, data that may inform on certain economic effects, the Commission is unable to quantify those economic effects. Further, even in cases where the Commission has some data, the number and type of assumptions necessary to quantify certain economic effects would render any such quantification unreliable. Our inability to quantify certain costs, benefits, and effects does not imply that such costs, benefits, or effects are less significant. The Commission requests that commenters provide relevant data and information to assist the Commission in quantifying the economic consequences of the proposed amendments to Rule 605.

B. Market Failure

The Commission is proposing to update the disclosure of order execution information and expand the scope of reporting entities under Rule 605 to achieve a variety of improvements to market participants' access to information about execution quality, which the Commission does not believe are likely to occur through a market-based solution.

Because equity markets have changed substantially since the initial adoption of Rule 605's predecessor in 2000, and yet the content of the disclosures required by Rule 605 has not been substantively updated since then,[500] the utility of Rule 605 reports has been eroded, which has limited the Rule's ability to address the market failures identified in the Adopting Release, including market centers' limited incentives to produce publicly available, standardized execution quality reports.[501] Instead, the metrics currently required to be reported by Rule 605 are no longer as useful for comparing execution quality across market centers as they were when Rule 605 was adopted, and other metrics that would be useful for this purpose are not currently included in reporting requirements, which limits the current benefits of Rule 605 for promoting competition among market centers and improving execution quality for all types of investors.

The Commission does not believe that updates to Rule 605 metrics are likely to be achieved through a market-based solution.[502] Even if all markets centers were incentivized to voluntarily produce updated statistics for competitive or reputational reasons (*e.g.,* they may lose business if their competitors provide reports and they do not), under current rules, there is little incentive for all market centers to agree on a standardized set of updated statistics. For example, market centers may be incentivized to design ad hoc reports to highlight areas where they believe they compare well to their competitors. Without a standardized set of statistics, it could be difficult for market participants to easily compare execution quality across market centers.

Furthermore, it may be difficult for certain market participants to compute accurate and relevant execution quality metrics from data sources other than data collected pursuant to Rule 605, due to the lack of granularity and significant time delay of many other publicly available datasets, which can lead to imprecise or stale measures. This limits certain market participants' ability to conduct analyses that examine and compare execution quality across market centers and may thereby further inform investors. Therefore, rulemaking to modernize the information required by Rule 605 may prove beneficial.[503]

In addition to the need to modernize the content of Rule 605, it may also be appropriate to expand the scope of entities that would be required to prepare Rule 605 reports to include larger broker-dealers.[504] Broker-dealers and their customers are subject to a classic principal-agent relationship in which the customer (the principal) submits an order to a broker-dealer (the agent) to handle its execution on the customer's behalf; however, information asymmetries prevent the customer from being able to directly observe the broker-dealer's handling of the customer's order.[505] This limits the extent to which broker-dealers need to compete for order flow on the basis of

[499] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75417.

[500] In 2018, while amending Rule 606, the Commission also modified Rule 605 to require that the public order execution quality report be kept publicly available for a period of three years. *See supra* note 11.

[501] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75414–15.

[502] In the Adopting Release, the Commission stated that, while some market centers may have voluntarily made order execution information privately available to independent companies or broker-dealers, the information in these reports generally had not been publicly disseminated. To the extent such information had been made available, not all of it was useful or in a form that would allow for cross-market comparisons. *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75431.

[503] *See supra* sections IV.A and IV.B describing, respectively, the proposed amendments modifying the scope of orders covered and information required to be disclosed pursuant to Rule 605.

[504] *See supra* note 1 defining ''larger broker-dealer'' as a broker-dealer that meets or exceeds the ''customer account threshold,'' as defined in proposed Rule 605(a)(7). *See also supra* section III.A describing the proposed amendments expanding the scope of Rule 605 reporting entities to include larger broker-dealers.

[505] Similar information asymmetries were recognized in the Adopting Release, which stated that ''the decision about where to route a customer order is frequently made by the broker-dealer, and broker-dealers may make that decision, at least in part, on the basis of factors that are unknown to their customers.'' *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75433.

execution quality, which may result in lower execution quality for their customers.

As with market centers, most broker-dealers also do not necessarily have incentives to produce public and standardized execution quality reports, and in that way are subject to the same market failures identified in the Rule 605 Adopting Release and described above. Furthermore, as discussed above in the context of market centers, even if broker-dealers are incentivized to produce execution quality reports, for example for marketing purposes or to protect against reputation loss, there are few incentives for broker-dealers to provide execution quality information that is standardized.[506] As a result, individual investors and, to some extent, institutional investors,[507] have limited access to standardized information that could be used to compare how execution quality varies across broker-dealers.[508] Therefore, it may be appropriate to engage in rulemaking to expand Rule 605 reporting requirements to larger broker-dealers.

While ''data available for downloading from a free website in a consistent, usable, and machine-readable electronic format'' is currently accessible under Rule 605,[509] the data generated under Rule 605 is complex, and the raw data may be difficult for individual investors to access and aggregate. Rule 605 reporting entities have little incentive to voluntarily summarize their execution quality in a standardized way. Instead, in summarizing their execution quality information, reporting entities may be incentivized to select the measures and aggregation methodologies that make them look the most favorable. Therefore, absent regulation, there is little incentive for Rule 605 reporting entities to coordinate on a standardized summary report that could be used to easily and accurately compare execution quality across reporting entities.[510]

C. Baseline

The baseline against which the costs, benefits, and the effects on efficiency, competition, and capital formation of the proposed amendments are measured consists of the regulatory baseline, which frames investors' current access to execution quality information under Rule 605, as well as market participants' present ability to use the information contained in current Rule 605 reports to evaluate and compare execution quality across reporting entities. Lastly, the baseline consists of the extent to which Rule 605 currently promotes competition on the basis of execution quality, both among broker-dealers and among market centers.

1. Regulatory Baseline

(a) Current Rule 605 Disclosure Requirements

Currently, Rule 605 requires market centers to make available, on a monthly basis, standardized information concerning execution quality for covered orders in NMS stocks.[511] Under the Rule, aggregated execution quality information on covered orders is reported for each individual security, with the information for each security broken out into multiple order type and size categories.[512] This format serves the purpose of allowing market participants to control for differences in market centers' order flow characteristics when assessing execution quality information, facilitating more apples-to-apples comparisons of execution quality across market centers. This is because a particular market center's order flow may be made up of a different mixture of securities, order types, and order sizes, which may impact or constrain that market center's overall execution quality level.[513]

The execution quality information required to be disclosed in Rule 605 reports pertains to several different aspects of execution quality, including execution prices, execution speeds, and fill rates. Information on execution prices includes, for market orders and marketable limit orders, the average effective spread,[514] number of shares executed at prices better than the quote, at the quote, or outside the quote,[515] as well as average dollar amount per share that orders were executed better than the quote or outside the quote.[516] Information on execution speeds includes, for all order types, the cumulative number of shares executed within different time-to-execution buckets[517] and, for market and marketable limit orders, the share-weighted average time to execution of orders executed better than the quote, at the quote, or outside the quote.[518] Information that can be used to calculate fill rates includes, for all order types, the cumulative number of shares of covered orders, the cumulative number of shares of covered orders executed at the receiving market center, and the cumulative number of shares of covered orders executed at any other venue.[519]

Market participants have access to public information about the execution quality of market centers other than Rule 605. For example, some

[506] While the FIF Template provides a standardized template for summary information about execution quality for retail investor orders in exchange-listed stocks (*see supra* note 450), the Commission understands that currently only one retail broker voluntarily provides reports using the FIF Template. *See also infra* notes 554–555 and accompanying text (discussing the limited number of firms that have produced reports utilizing the FIF Template at various points in time). There are also some broker-dealers that disclose their own execution quality metrics on their respective websites, but the disclosures tend to differ in ways that make them difficult to compare, such as reporting different metrics, using different methodologies, or different samples of stocks. *See, e.g., Order Execution Quality,* TD Ameritrade, *available at https://www.tdameritrade.com/tools-and-platforms/order-execution.html; Execution Quality,* E*TRADE from Morgan Stanley, *available at https://us.etrade.com/trade/execution-quality; Our Execution Quality,* Robinhood, *available at https://robinhood.com/us/en/about-us/our-execution-quality/.*

[507] While institutional investors are likely to have access to alternative sources of execution quality information, such as Rule 606(b)(3) reports and transaction cost analysis, the information on execution quality that is individually collected by institutional investors is typically non-public and highly individualized, and therefore limited to the execution quality obtained from broker-dealers with which the institutional investors currently does business. Since Rule 605 reports are public, institutional investors could use these reports to assess the execution quality of the broker-dealers and market centers with which they do not currently do business. *See infra* section VII.C.1.(c)(2) for further discussion.

[508] Institutional and individual investor customers of broker-dealers may differ in their abilities to request execution quality information from their broker-dealers. *See infra* sections VII.C.1.(c)(1) and VII.C.1.(c)(2) for further discussion.

[509] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75436.

[510] *See supra* section V describing the proposed amendments requiring Rule 605 reporting entities to prepare summary reports of execution quality information.

[511] *See* 17 CFR 242.605.

[512] *See supra* notes 39–40 for a discussion and definitions of these order categories.

[513] For example, larger order sizes are typically more difficult to ''work'' than smaller order sizes, so the execution quality information of a market center that tends to handle larger order sizes would likely be more constrained than that of a market center that tends to handle smaller order sizes.

[514] *See* 17 CFR 242.605(a)(1)(ii)(A).

[515] *See* 17 CFR 242.605(a)(1)(ii)(B), 17 CFR 242.605(a)(1)(ii)(E) and 17 CFR 242.605(a)(1)(ii)(G), respectively.

[516] *See* 17 CFR 242.605(a)(1)(ii)(C) and 17 CFR 242.605(a)(1)(ii)(H), respectively.

[517] The time-to-execution categories currently defined in Rule 605 are shares executed from 0 to 9 seconds, shares executed from 10 to 29 seconds, shares executed from 30 to 59 seconds, shares executed from 60 to 299 seconds, and shares executed from 5 to 30 minutes. *See* 17 CFR 242.605(a)(1)(i)(F)–(J).

[518] *See* 17 CFR 242.605(a)(1)(ii)(D), 17 CFR 242.605(a)(1)(ii)(F) and 17 CFR 242.605(a)(1)(ii)(I), respectively.

[519] *See* 17 CFR 242.605(a)(1)(i)(B), 17 CFR 242.605(a)(1)(i)(D) and 17 CFR 242.605(a)(1)(i)(E). The fill rate can be calculated as Fill Rate = (Cumulative Number of Shares Executed at Receiving Market Center + Cumulative Number of Shares Executed at Other Venues)/(Cumulative Number of Covered Shares).

wholesalers and ATSs make additional order flow and execution quality statistics other than those required under Rule 605 available either on their websites or as part of their ATS–N filings.[520] However, these sources are either not standardized [521] or are not available across all market centers,[522] such that Rule 605 is an important source of standardized information about market center execution quality.

The Commission believes that standardized execution quality information is relevant to many market participants, including to both individual and institutional investors and their broker-dealers,[523] who are subject to a principal-agent relationship in which an order submitter (the principal) submits an order to an agent to handle on its behalf, but information asymmetries prevent the principal from being able to directly observe the agent's handling of the order. This can create possible conflicts of interest, in which the agent's incentives may not coincide with the interests of the principal.[524] These information asymmetries exist both between broker-dealers and their customers, who do not directly observe their broker-dealers' handling of their orders,[525] and between market centers and broker-dealers, who typically do not directly observe market centers' executions of their routed orders. Rule 605 serves to alleviate these information asymmetries by, first, giving broker-dealers access to information about the execution quality of market centers, which they can use to inform their routing decisions and, second, in conjunction with broker-dealer routing information from Rule 606 reports,[526] giving investors access to information about the execution quality achieved by the market centers to which their broker-dealers typically route.[527]

Information on the execution quality obtained by broker-dealers is particularly important for investors. As broker-dealers that route customer orders have many choices about where to route orders for execution,[528] their routing decisions affect the execution quality that their customers' orders receive, leading to significant variations in execution quality across broker-dealers. For example, a broker-dealer may route a marketable IOC order to a market center that is not posting any liquidity at the NBBO (in which case the order would be cancelled), or a broker-dealer may route a NMLO to a market center that is not attracting any trading interest (in which case the NMLO would likely be cancelled at the end of day, if not earlier). The authors of one recent academic working paper ran an experiment in which they placed identical simultaneous market orders across various broker-dealers, and found that the execution quality of these orders differed significantly in terms of average price improvement and effective spreads.[529] The authors argue that these differences in execution quality across broker-dealers are economically significant, as they estimate that every basis point difference in execution quality is equivalent to an annual cost to investors of $2.8 billion.[530] Given this evidence that there are significant differences in execution quality across broker-dealers, without access to standardized information about broker-dealer execution quality, it is difficult for investors to compare these differences when choosing a broker-dealer.

Given that Rule 605 reports contain aggregated information, some information asymmetries regarding the order execution quality achieved at different market centers are not fully addressed by Rule 605 because the principal is not able to use Rule 605 reports to observe the execution quality that the agent achieved for the principal's individual orders. However, the principal is able to receive a signal of the execution quality that the agent has achieved for comparable orders over a certain time period. This signal can be a useful proxy that investors and their broker-dealers can use to assess and compare the execution quality that they can expect to receive across market centers, and there is evidence that Rule 605 reports have indeed been used for this purpose. One academic study examining the introduction of Rule 605 found that the routing of marketable order flow by broker-dealers became more sensitive to changes in execution quality across market centers after Rule 605 reports became available.[531] The authors attribute this effect to broker-dealers factoring in information about the execution quality of market centers from Rule 605 reports when making their order routing decisions.

(b) Current Rule 606 Disclosure Requirements

Currently, under Rule 606, broker-dealers are required to identify the venues, including market centers, to which they route customer orders for execution.[532] Specifically, with respect to held orders, Rule 606(a)(1) requires broker-dealers to produce quarterly public reports containing information about the venues to which the broker-dealer regularly routed non-directed orders for execution, including any payment relationship between the broker-dealer and the venue, such as

[520] If an ATS provides one or more of its subscribers with aggregate platform-wide order flow and execution statistics that were not otherwise required disclosures under Rule 605, that ATS is required to either attach that information to its Form ATS–N, or certify that the information is available on its website. *See* Item 26 of Form ATS–N, *available at https://www.sec.gov//files/formats-n.pdf.*

[521] For example, reports contain different execution quality metrics or, if they contain the same execution quality metrics, these metrics are calculated using different methodologies, different samples of stocks, and/or different time horizons, making it difficult to compare across reporting entities. For example, some ATSs produce execution quality information on a monthly basis (*see, e.g., Unlocking Global Liquidity,* UBS, *available at https://www.ubs.com/global/en/investment-bank/electronic-trading/equities/unique-liquidity.html*), while at least one ATS operator produces reports on a quarterly basis (*see, e.g., JPM–X & JPB–X U.S. Quarterly Summary,* J.P. Morgan, *available at https://www.jpmorgan.com/solutions/cib/markets/jpm-x-jpb-x-us-quarterly-summary*).

[522] While the FIF Template represents a standardized set of execution quality statistics, only one wholesaler currently produces reports using the FIF Template. *See infra* note 555.

[523] *See infra* sections VII.C.1.(c)(1) and VII.C.1.(c)(2) for further discussions of how publicly available execution quality information may be useful for both individual and institutional investors.

[524] If there were no information asymmetries and the principal could perfectly observe the agent's handling of its order, and if there is competition among agents, then the principal-agent relationship would not necessarily result in any conflicts of interest as the principal would be able to directly observe the agent's actions and switch to another agent.

[525] *See supra* note 505, noting that a similar principal-agent problem was recognized in the Adopting Release.

[526] *See infra* section VII.C.2.(a)(1), which discusses issues with the usage of Rule 606 broker-dealer routing information and Rule 605 execution quality information to infer the execution quality achieved by broker-dealers.

[527] Some market participants may have access to sources of execution quality information that reduce these information asymmetries and may serve as an alternative to Rule 605 data. *See infra* section VII.C.1.(c) for a detailed discussion. Note that any source of ex post execution quality information is unlikely to eliminate this information asymmetry entirely, as it is likely infeasible for any agent to perfectly observe ex ante or even in real time how a principal will perform in executing their order.

[528] *See infra* section VII.C.3.(b)(1) for a discussion of fragmentation in the market for trading services.

[529] *See* Christopher Schwarz, Brad M. Barber, Xing Huang, Philippe Jorion & Terrance Odean, *The 'Actual Retail Price' of Equity Trades* (Aug. 28, 2022) *available at https://ssrn.com/abstract=4189239* (retrieved from SSRN Elsevier database). The authors find that this dispersion is due to off-exchange wholesalers systematically giving different execution prices for the same trades to different brokers.

[530] *See id.* at 24.

[531] *See* Boehmer et al.

[532] *See* 17 CFR 242.606.

any PFOF arrangements.[533] In addition, Rule 606(b)(1) requires broker-dealers to provide to their customers, upon request, reports that include high-level customer-specific order routing information, such as the identity of the venues to which the customer orders were routed for execution in the prior six months and the time of the transactions, if any, that resulted from such orders.[534] For orders submitted on a held basis, the reports required by Rule 606 do not contain any execution quality information.

When the Commission adopted the predecessor to Rule 606, it was intended to supply investors with information on where their orders are routed, which could be used along with information from Rule 605 about the quality of execution from the market centers to which their orders are routed in order to make more informed decisions with respect to their orders.[535] In theory, investors should be able to use Rule 606 reports to identify the market centers to which their broker-dealers are routing orders, and then use Rule 605 to estimate the execution quality offered by those market centers.[536] These market centers' aggregated execution quality metrics could then be used as a proxy for the execution quality that broker-dealers achieved for their customers' orders.

Following amendments to Rule 606 in 2018,[537] broker-dealers are subject to requirements under Rule 606 that provide information about the execution quality achieved by their broker-dealers for not held orders, which are typically used by institutional investors.[538] Specifically, Rule 606(b)(3) requires broker-dealers to produce reports pertaining to order handling upon the request of a customer that places, directly or indirectly, one or more orders in NMS stocks that are submitted on a not held basis, subject to a de minimis exception.[539] These reports include aggregated execution quality metrics such as fill rate, percentage of shares executed at the midpoint, and percentages of total shares executed that were priced on the side of the spread more favorable to the order and on the side of the spread less favorable to the order.[540]

(c) Current Usage of Rule 605 Reports

Rule 605 data is currently used by some market participants, such as broker-dealers and investment advisers as part of their review of execution quality. However, the use of this data by both individual and institutional investors to directly evaluate and compare execution quality across market centers is currently limited.

(1) Usage of Rule 605 Reports by Individual Investors

It is likely that the extent to which individual investors directly access Rule 605 reports is currently limited. Several market participants have stated that Rule 605 reports have low usage among individual investors, including at least one commenter to the Commission's Concept Release on Equity Market Structure,[541] and some EMSAC committee members.[542]

Rule 605 reports are designed to be machine-readable, rather than human-readable. While machine-readable data is useful for facilitating further processing and analysis,[543] it is not readily usable by market participants and other interested parties that may prefer to review summary statistics, and is not easily consumable by market participants who do not have the access to necessary software or programming skills. This may limit the usability of Rule 605 reports for individual investors in particular, who are less likely to have access to these resources. In the Adopting Release, the Commission anticipated that, rather than individual investors obtaining and digesting Rule 605 reports themselves, independent analysts, consultants, broker-dealers, the financial press, and market centers would analyze the information and produce summaries that respond to the needs of investors.[544] Although the Commission is unable to observe the full extent to which this has occurred, some third parties have produced information based on Rule 605 reports that is meant for public consumption. For example, data obtained from Rule 605 reports are used by academics to study a variety of topics related to execution quality, including liquidity measurement, exchange competition, zero commission trading, and broker-dealer execution quality,[545] and at least one market participant used Rule 605 data in an analysis supporting its letter to the Commission commenting on one national securities exchange's registration application.[546] Rule 605 data is also used in the financial press.[547]

Unlike institutional investors,[548] individual investors typically have limited access to alternative sources of standardized execution quality information that could be used to compare across broker-dealers other than information obtained (directly or

[533] *See* 17 CFR 242.606(a)(1). *See also* corresponding discussion in section III.A, *supra.*

[534] *See* 17 CFR 242.606(a)(2). *See also* corresponding discussion in section III.A, *supra.*

[535] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75435 (''Rule 11Ac1–6 is designed to address the complementary need for broker-dealers to disclose to customers where their orders are routed for execution. The primary objective of the rule is to afford customers a greater opportunity to monitor their broker-dealer's order routing practices. Supplied with information on where their orders are routed, as well as information about the quality of execution from the market centers to which their orders are routed, investors will be able to make better informed decisions with respect to their orders. The information also may assist investors in selecting a broker-dealer.'').

[536] *See infra* section VII.C.2.(a)(1) for a discussion of current issues with using information from Rule 606 reports to infer the execution quality of broker-dealers.

[537] *See supra* note 60 and accompanying text for a discussion of these amendments.

[538] An analysis included in the 2018 Rule 606 Amendments Release looked at orders submitted from customer accounts of 120 randomly selected NMS stocks listed on NYSE during the sample period of December 5, 2016, to December 9, 2016, consisting of 40 large-cap stocks, 40 mid-cap stocks, and 40 small-cap stocks. The analysis found that among the orders received from the institutional accounts, about 69% of total shares and close to 39% of total number of orders in the sample are not held orders, whereas among the orders received from the individual accounts, about 19% of total shares and about 12% of total number of orders in the sample are not held orders. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58393. *See also supra* note 56 and accompanying text, describing the Commission's understanding that held orders are typically used by individual investors.

[539] *See* 17 CFR 242.606(b)(3). In addition, Rule 606(b)(5)'s customer-level de minimis exception exempts broker-dealers from providing upon request execution quality reports for customers that traded on average each month for the prior six months less than $1,000,000 of notional value of not held orders in NMS stocks through the broker-dealer. *See* 17 CFR 242.606(b)(5).

[540] *See* 17 CFR 242.606(b)(3)(ii).

[541] *See, e.g.,* Letter from Daniel Keegan, Managing Director, Citigroup Global Markets Inc. re Concept Release on Equity Market Structure (Release No. 34–61358; File No. S7–02–10) (May 5, 2010) (''Citigroup Letter II'') at 6.

[542] *See supra* note 112 and accompanying text.

[543] *See* discussion in *infra* section VII.C.1.(c)(2).

[544] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419.

[545] *See, e.g.,* Ruslan Y. Goyenko, Craig W. Holden & Charles Trzcinka, *Do liquidity measures measure liquidity?* 92 J. Fin. Econ. 153 (2009); Edward D. Watson & Donovan Woods, *Exchange introduction and market competition: The entrance of MEMX and MIAX,* 54 Glo. Fin. J. (2022) 100756; Pankaj K. Jain, Suchismita Mishra, Shawn O'Donoghue & Le Zhao, *Trading Volume Shares and Market Quality: Pre-and Post-Zero Commissions* (working paper Dec. 2, 2020), *available at https://ssrn.com/abstract=3741470* SSRN 3741470 (retrieved from SSRN Elsevier database); Schwarz et al (2022).

[546] *See, e.g.,* Letter from David Weisberger, Managing Director, Markit, New York, New York Re: Investor's Exchange LLC Form 1 Application; Release No. 34–75925; File No. 10–222 (Feb. 16, 2016), *available at https://www.sec.gov/comments/10-222/10222-394.pdf.*

[547] *See, e.g.,* Bill Alpert ''Who Makes Money on Your Stock Trades,'' Barron's, Feb. 28, 2015 (retrieved from Factiva database) (stating that ''we ran each market maker's Rule 605 execution reports through statistical-analysis scripts that we wrote in the widely used open-source math software known as 'R.' '').

[548] *See* discussion in *infra* section VII.C.1.(c)(2).

indirectly) from Rule 605 reports.[549] The requirement in Rule 606(b)(3) for broker-dealers to provide individualized reports of execution quality to their customers upon request does not extend to held orders, which are mostly used by individual investors,[550] and contains a customer-level de minimis exception that likely excludes most individual investors.[551] In addition, many individual investors do not have access to the information or expertise required to calculate their own execution quality metrics, which makes it difficult for them to compare how execution quality varies across broker-dealers.[552]

One exception is the recent efforts by a few brokers-dealers and wholesalers to make available voluntary summary disclosures of execution quality in exchange-listed stocks for individual investors using the FIF Template.[553] Although the reports produced using the FIF Template may be useful, this disclosure is voluntary, and only a few firms are making or have made such disclosures. The Commission understands that only three retail brokers began producing reports using the FIF Template in 2015 on a quarterly basis, and that one of these broker-dealers was acquired and stopped producing these reports in 2017, and another stopped producing these reports in 2018, such that only one retail broker currently produces reports using the FIF Template.[554] Likewise, the Commission understands that there is currently only one wholesaler producing reports using the FIF Template.[555]

(2) Usage of Rule 605 Reports by Institutional Investors

The Commission preliminarily understands that, while the usage of Rule 605 reports by institutional investors may be limited by several factors, Rule 605 reports nevertheless contain information about execution quality that is otherwise useful for institutional investors.

First, institutional investors typically have access to alternative sources of execution quality information. Many institutional investors regularly conduct, directly or through a third-party vendor, transaction costs analysis (''TCA'') of their orders to assess execution quality against various benchmarks. Institutional investors that perform their own in-house analyses of execution quality or obtain analyses of execution quality from third-party vendors would be less likely to rely on information from Rule 605 reports in order to estimate the execution quality of their orders. Furthermore, the requirement in Rule 606(b)(3) for broker-dealers to provide individualized reports of execution quality of not held orders upon request,[556] which is most likely to be utilized by institutional investors,[557] provides institutional investors with another alternative source of information about the execution quality of their orders. While broker-dealers are currently required to provide their customers only with execution quality information about their not held orders under Rule 606(b)(3), which are not covered by Rule 605 reporting requirements, given the large size of most institutional investors and their business, institutional investors may have sufficient bargaining power such that broker-dealers have strong incentives to provide them with this information about the execution quality of their held orders when asked.

However, because Rule 605 reports are public, institutional investors can use these reports to assess the execution quality of the broker-dealers and market centers with which they do not currently do business. The information on execution quality that is individually collected by institutional investors is typically highly individualized and non-public.[558] Therefore, institutional investors would not be able to use these individualized reports to compare their broker-dealers' execution quality to that of broker-dealers with which they do not currently have a relationship, or to examine the execution quality of a market center to which their broker-dealers do not currently route orders. Furthermore, any ad hoc reports that institutional investors may receive from their broker dealers containing information about their held orders are unlikely to be sufficiently standardized to allow for easy comparisons across broker-dealers or market centers.

Second, Rule 605 reports only contain information about the execution quality of investors' held orders. Not held orders, which are excluded from the definition of ''covered order,'' [559] are excluded from Rule 605 metrics.[560] As many institutional orders tend to be not held,[561] this may limit the extent to which Rule 605 reports contain relevant information for institutional investors. Rule 605 reports may contain information that is relevant for institutional investors, however, as large institutional ''parent'' orders are often split into multiple smaller ''child'' orders, which may be handled as held orders and reflected in Rule 605 reports. This would allow institutional investors to use the information in Rule 605 reports to evaluate the performances of their broker-dealers. For example, institutional investors may incorporate information from Rule 605 reports into their TCA when evaluating the performance of their broker-dealers'

[549] There are also some broker-dealers that disclose their own execution quality metrics on their respective websites, but the disclosures are not standardized and tend to differ in ways that make them difficult to compare, such as reporting different metrics, using different methodologies, or different samples of stocks. *See supra* note 506.

[550] *See supra* note 538 describing an analysis showing that not held orders made up only 19% of total shares and about 12% of total number of orders among the sample of orders received from the individual accounts.

[551] *See supra* note 539 describing the customer-level de minimis exception of Rule 606(b)(5).

[552] *See infra* section VII.C.2.(a)(1) discussing several analyses that find significant differences in execution quality across retail brokers.

[553] *See supra* note 450 and accompanying text for further discussion of the FIF Template.

[554] *See Retail Execution Quality Statistics,* Financial Information Forum, *available at https://fif.com/tools/retail-execution-quality-statistics; Retail Execution Quality Statistics Q2—2022,* Fidelity, *available at https://www.fidelity.com/bin-public/060_www_fidelity_com/documents/FIF-FBS-retail-execution-quality-stats.pdf.*

[555] *See Retail Execution Quality Statistics,* Financial Information Forum, *available at https://fif.com/tools/retail-execution-quality-statistics; Retail Execution Quality Statistics—Wholesale Market Maker Perspective,* Two Sigma, *available at https://www.twosigma.com/businesses/securities/execution-statistics/.* The Commission is aware of at least two wholesalers that formerly produced reports using the FIF Template, but stopped in Q3 2019.

[556] *See supra* Section VIII.C.1.(b) discussing broker-dealer reporting requirements under Rule 606.

[557] *See supra* note 538 discussing an analysis showing that institutional investors are more likely than individual investors to use not held orders. *See also supra* note 539 describing the customer-level de minimis exception of Rule 606(b)(5).

[558] In 2018, the Commission proposed but ultimately did not adopt a requirement that broker-dealers that handle orders subject to the customer-specific disclosures required by Rule 606(b)(3) issue a quarterly public aggregated disclosure on order handling. *See* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58369.

[559] Currently there are no requirements for aggregated information about the execution quality of not held orders to be made public. The Commission believes that the potential ability for customers and broker-dealers to use aggregated order handling information for not held orders to better understand broker-dealers' routing behavior or compare broker-dealers' order routing performance is limited as a result of the disparate behavior of customers when using not held orders. *See, e.g.,* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58369–70, in which the Commission stated that, in contrast to held orders, not held order flow is diverse and customers may provide specific order handling instructions to their broker-dealers, limit the order handling discretion of their broker-dealers, or have specific needs that impact the broker-dealers' handling of these orders. *See also supra* note 63 for further discussion.

[560] *See supra* note 60 and accompanying text discussing broker-dealers requirements under Rule 606(b)(3) to provide individualized reports of execution quality upon request for not held orders.

[561] *See supra* note 538 discussing an analysis showing that institutional investors are more likely than individual investors to use not held orders.

Smart Order Router (''SOR'') algorithms.[562]

The Commission believes that, due to their typically larger resources, institutional investors may be more likely than individual investors to access Rule 605 reports directly. Rule 605 reports are machine-readable, which makes them useful for facilitating further processing and analysis by market participants that have access to the resources necessary for handling large amounts of raw data, such as many institutional investors. However, the Commission understands some institutional investors may currently use aggregated statistics or summaries of Rule 605 reports prepared by third parties, who make these reports available, possibly for a fee.

(3) Other Users of Rule 605 Reports

While the direct usage of Rule 605 reports by individual and institutional investors is likely limited, Rule 605 reports are currently used by other market participants, including analysts and researchers,[563] as well as financial service providers, such as investment advisers and broker-dealers, that are subject to best execution obligations.

In particular, the Commission understands that investment advisers and broker-dealers typically use Rule 605 reports as part of their internal review of execution quality. As fiduciaries, investment advisers owe their clients a duty of care and a duty of loyalty.[564] The duty of care includes, among other things, the duty to seek best execution of a client's transactions where the investment adviser has the responsibility to select broker-dealers to execute client trades.[565] Broker-dealers also have an obligation to seek best execution of customer orders.[566] The Commission understands that these financial service providers often have Best Execution Committees that periodically review order execution quality, and typically use Rule 605 reports as part of their review.[567]

(d) Rules Addressing Consolidated Market Data

In 2020, the Commission adopted a new rule and amended existing rules to establish a new infrastructure for consolidated market data,[568] and the regulatory baseline includes these changes to the current arrangements for consolidated market data. However, as discussed in more detail below, the MDI Rules have not been implemented, and so they have not yet affected market practice. As a result, the data used to measure the baseline below reflects the regulatory structure in place for consolidated market data prior to the implementation of the MDI Rules. Accordingly, this section first will briefly summarize the regulatory structure for consolidated market data prior to the implementation of the MDI Rules. It then will discuss the current status of the implementation of the MDI Rules and provide an assessment of the potential effects that the implementation of the MDI Rules could have on the baseline estimations.

(1) Regulatory Structure for Consolidated Market Data Prior to the MDI Rules

Consolidated market data is made widely available to investors through the national market system, a system set forth by Congress in section 11A of the Exchange Act [569] and facilitated by the Commission in Regulation NMS.[570] Market data is collected by exclusive SIPs,[571] which consolidate that information and disseminate an NBBO and last sale information. For quotation information, only the 16 national securities exchanges that currently trade NMS stocks provide quotation information to the SIPs for dissemination in consolidated market data.[572] FINRA has the only SRO display-only facility (the Alternative Display Facility, or ADF). No broker-dealer, however, currently uses it to display quotations in NMS stocks in consolidated market data. Disseminated quotation information includes each exchange's current highest bid and lowest offer and the shares available at those prices, as well as the NBBO.

For transaction information, currently all of the national securities exchanges that trade NMS stocks and FINRA provide real-time transaction information to the SIPs for dissemination in consolidated market data. Such information includes the symbol, price, size, and exchange of the transaction, including odd-lot transactions.

(2) Unimplemented Market Data Infrastructure Rules

Among other things, the unimplemented MDI Rules update and expand the content of consolidated market data to include: (1) certain odd-lot information; [573] (2) information about certain orders that are outside of an exchange's best bid and best offer (*i.e.,* certain depth of book data); [574] and (3) information about orders that are participating in opening, closing, and

[562] *See infra* section VII.C.3.(a)(1)(b) discussing the use of SORs by broker-dealers to split a large institutional ''parent'' order into multiple ''child'' orders in a way that achieves the best execution for the parent order.

[563] *See, e.g., supra* notes 545–547, describing the use of Rule 605 data in academic literature, in comment letters related to Commission and SRO rulemaking, and the financial press.

[564] *See* Investment Advisers Act Release No. 5248 (June 5, 2019), 84 FR 33669 (July 12, 2019) (Commission Interpretation Regarding Standard of Conduct for Investment Advisers) (''IA Fiduciary Interpretation'').

[565] *See, e.g.,* Investment Advisers Act Rule 206(3)–2(c). The Commission previously has described the contours of an investment adviser's duty to seek best execution. IA Fiduciary Interpretation, 84 FR 33669 (Jul. 12, 2019) at 33674–75. In addition, the Commission has brought a variety of enforcement actions against registered investment advisers in connection with their alleged failure to satisfy their duty to seek best execution. *See, e.g., In the Matter of Aventura Capital Management, LLC,* Investment Advisers Act Release No. 6103 (Sept. 6, 2022) (settled action); *In the Matter of Madison Avenue Securities, LLC,* Investment Advisers Act Release No. 6036 (May 31, 2022) (settled action).

[566] *See supra note* 69 and accompanying text for further discussion of broker-dealers' best execution requirements.

[567] *See, e.g., Practical Considerations for Your 'Best Execution Compliance Program',* Ernst & Young (Mar. 2017), *available at http://documents.sifma.org/uploadedFiles/Events/2017/Compliance_and_Legal_Society_Annual_Seminar/EY_CL%20Annual_Marketing%20PDF.pdf* (stating the broker-dealers rely on ''traditional 605 metrics'' for best execution review). *See also* Citigroup Letter II at 7 (stating that, ''under the current market structure, broker-dealers closely review and analyze Rule 605 statistics as part of their regular and rigorous review for best execution'').

[568] *See supra* section IV.B.5, discussing the MDI Rules.

[569] *See supra* note 3 and accompanying text.

[570] 17 CFR 242.600 through 242.614.

[571] *See supra* note 195 and accompanying text.

[572] Currently, these national securities exchanges are: Cboe BYX Exchange, Inc. (''Cboe BYX''); Cboe BZX Exchange, Inc. (''Cboe BZX''); Cboe EDGA Exchange, Inc. (''Cboe EDGA''); Cboe EDGX Exchange, Inc. (''Cboe EDGX''); Investors Exchange LLC (''IEX''); Long-Term Stock Exchange, Inc. (''LTSE''); MEMX LLC (''MEMX''); MIAX Pearl, LLC (''MIAX PEARL''); Nasdaq BX, Inc. (''Nasdaq BX''); Nasdaq PHLX LLC (''Nasdaq Phlx''); The Nasdaq Stock Market LLC (''Nasdaq''); NYSE; NYSE American LLC (''NYSE American''); NYSE Arca, Inc. (''NYSE Arca''); NYSE Chicago, Inc. (''NYSE CHX''); and NYSE National, Inc. (''NYSE National''). The Commission approved rules proposed by BOX Exchange LLC (''BOX'') for the listing and trading of certain equity securities that would be NMS stocks on a facility of BOX known as BSTX LLC (''BSTX''), but BSTX is not yet operational. *See* Securities Exchange Act Release Nos. 94092 (Jan. 27, 2022), 87 FR 5881 (Feb. 2, 2022) (SR–BOX–2021–06) (approving the trading of equity securities on the exchange through a facility of the exchange known as BSTX); 94278 (Feb. 17, 2022), 87 FR 10401 (Feb. 24, 2022) (SR–BOX–2021–14) (approving the establishment of BSTX as a facility of BOX). BSTX cannot commence operations as a facility of BOX until, among other things, the BSTX Third Amended and Restated Limited Liability Company Agreement approved by the Commission as rules of BOX is adopted. *Id.* at 10407.

[573] *See supra* note 422 and accompanying text for further discussion of changes to the availability of odd-lot information under the MDI Rules.

[574] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18625.

other auctions.[575] The Rules also introduce a four-tiered definition of round lot that is tied to a stock's average closing price during the previous month.[576] For stocks with prices greater than $250, a round lot is defined as consisting of between 1 and 40 shares, depending on the tier.[577] The MDI Rules also introduce a decentralized consolidation model under which competing consolidators, rather than the existing exclusive SIPs, will collect, consolidate, and disseminate certain NMS information.[578]

In the MDI Adopting Release, the Commission established a transition period for the implementation of the MDI Rules.[579] The ''first key milestone'' for the transition period was to be an ''amendment of the effective national market system plan(s),'' which ''must include the fees proposed by the plan(s) for data underlying'' consolidated market data (''Proposed Fee Amendment'').[580] The compliance date for the Infrastructure Rules was set with reference to the date that the Commission approved the Proposed Fee Amendment.[581] The end of the transition period was to be at least two years after the date the Commission approved the Proposed Fee Amendment.[582]

The MDI Adopting Release did not specify a process for continuing the transition period if the Commission disapproved the Proposed Fee Amendment. On September 21, 2022, the Commission disapproved the Proposed Fee Amendment, because the Participants had not demonstrated that the proposed fees were fair, reasonable and not unreasonably discriminatory.[583] Accordingly, there currently is no date to begin the at-least-two-year period for implementation of the MDI Rules, and there is no date that can be reasonably estimated for the implementation of the MDI Rules to be completed.

Given that the MDI Rules have not yet been implemented, they have not affected market practice and therefore data that would be required for a comprehensive quantitative analysis of a baseline that includes the effects of the MDI Rules is not available. It is possible that the baseline (and therefore the economic effects relative to the baseline) could be different once the MDI Rules are implemented. The following discussion reflects the Commission's assessment of the anticipated economic effects of the MDI Rules described in the MDI Adopting Release as they relate to the baseline for this proposal.[584]

The Commission anticipated that the new round lot definition will result in narrower NBBO spreads for most stocks with prices greater than $250 because, for these stocks, fewer odd-lot shares will need to be aggregated together (possibly across multiple price levels[585]) to form a round lot and qualify for the NBBO.[586] The reduction in spreads will be greater in higher-priced stocks because the definition of a round lot for these stocks will include fewer shares, such that even fewer odd-lot shares will need to be aggregated together.[587] This could cause statistics that are measured against the NBBO to change because they will be measured against the new, narrower NBBO. For example, execution quality statistics on price improvement for higher-priced stocks may show a reduction in the number of shares of marketable orders that received price improvement because price improvement will be measured against a narrower NBBO. In addition, the Commission anticipated that the NBBO midpoint in stocks priced higher than $250 could be different under the MDI Rules than it otherwise would be, resulting in changes in the estimates for statistics calculated using the NBBO midpoint, such as effective spreads. In particular, at times when bid odd-lot quotations exist within the current NBBO but no odd-lot offer quotations exist (and vice versa), the midpoint of the NBBO resulting from the rule will be higher than the current NBBO midpoint.[588] More broadly, the Commission anticipated that the adopted rules will have these effects whenever the new round lot bids do not exactly balance the new round lot offers. However, the Commission stated that it does not know to what extent or direction such odd-lot imbalances in higher priced stocks currently exist, so it is uncertain of the extent or direction of the change.[589]

The Commission also anticipated that the MDI Rules could result in a smaller number of shares at the NBBO for most stocks in higher-priced round lot tiers.[590] To the extent that this occurs, there could be an increase in the frequency with which marketable orders must walk the book to execute. This would affect statistics that are calculated using consolidated depth information, such as measures meant to capture information about whether orders received an execution of more than the displayed size at the quote, *i.e.,* ''size improvement.''

The MDI Rules may also result in a higher number of odd-lot trades, as the inclusion of odd-lot quotes that may be priced better than the current NBBO in consolidated market data may attract more trading interest from market participants that previously did not have access to this information.[591] However, the magnitude of this effect depends on the extent to which market participants who rely solely on SIP data and lack information on odd-lot quotes choose to receive the odd-lot information and trade on it. The Commission states in the MDI Adopting

[575] *See id.* at 18630.

[576] *See id.* at 18617.

[577] *See id.* The Commission adopted a four-tiered definition of round lot: 100 shares for stocks priced $250.00 or less per share, 40 shares for stocks priced $250.01 to $1,000.00 per share, 10 shares for stocks priced $1,000.01 to $10,000.00 per share, and 1 share for stocks priced $10,000.01 or more per share.

[578] *See id.* at 18637.

[579] *See id.* at 18698–18701.

[580] *See id.* at 18699.

[581] *See, e.g., id.* at 18700 n. 355 (compliance date for amendment to Rule 603(b) to be ''180 calendar days from the date of the Commission's approval of the amendments to the effective national market system plan(s)'').

[582] *See id.* at 18700–18701 (specifying consecutive periods of 90 days, 90 days, 90 days, 180 days, 90 days, a period for filing and approval of another national market system plan amendment to effectuate the cessation of the operations of the SIPS (with a 300-day maximum time for Commission action after filing to approve or disapprove the filing), and a 90-day period).

[583] Securities Exchange Act Release No. 95851 (Sept. 21, 2022) (Order Disapproving the Twenty-Fifth Charges Amendment to the Second Restatement of the CTA Plan and Sixteenth Charges Amendment to the Restated CQ Plan).

[584] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18741–18799.

[585] The calculation of the NBBO includes odd-lots that, when aggregated, are equal to or greater than a round lot. Under CFR 242.600(b)(21)(ii), ''such aggregation shall occur across multiple prices and shall be disseminated at the least aggressive price of all such aggregated odd-lots.'' For example, if there is one 50-share bid at $25.10, one 50-share bid at $25.09, and two 50-share bids at $25.08, the odd-lot aggregation method would show a protected 100-share bid at $25.09.

[586] For example, if there is one 20-share bid at $250.10, one 20-share bid at $250.09, and two 50-share bids at $250.08, prior to MDI the NBB would be $250.08, as even aggregated together the odd lot volume would not add up to at least a round lot. After MDI, the NBB would be $25.09, as the odd-lot aggregation method would show a protected 40-share round lot bid at $25.09.

[587] *See supra* note 577. An analysis in the MDI Adopting Release showed that the new round lot definition caused a quote to be displayed that improved on the current round lot quote 26.6% of the time for stocks with prices between $250.01 and $1,000, and 47.7% of the time for stocks with prices between $1,000.01 and $10,000. *See* MDI Adopting Release, 86 FR at 18743.

[588] For example, if the NBB is $260 and the NBO is $260.10, the NBBO midpoint is $260.05. Under the adopted rules a 40 share buy quotation at $260.02 will increase the NBBO midpoint to $260.06. Using this new midpoint, calculations of effective spread will be lower for buy orders, but will be higher for sell orders.

[589] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18750.

[590] However, this effect will depend on how market participants adjust their order submissions. *See id.* at 18746 for further discussion.

[591] *See id.* at 18754.

Release that it believes it is not possible to observe this willingness to trade with existing market data.[592]

The MDI Rules may have implications for broker-dealers' order routing practices. For those market participants that rely solely on SIP data for their routing decisions and that choose to receive the expanded set of consolidated market data, the Commission anticipated that the additional information contained in consolidated market data will allow them to make more informed order routing decisions. This in turn would help facilitate best execution, which would reduce transaction costs and increase execution quality.[593]

The MDI Rules may also result in differences in the baseline competitive standing among different trading venues, for several reasons. First, for stocks with prices greater than $250, the Commission anticipated that the new definition of round lots may affect order flows as market participants who rely on consolidated data will be aware of quotes at better prices that are currently in odd-lot sizes, and these may not be on the same trading venues as the one that has the best 100 share quote.[594] Similarly, it anticipated that adding information on odd-lot quotes priced at or better than the NBBO to expanded core data may cause changes to order flow as market participants take advantage of newly visible quotes.[595] However, the Commission stated that it was uncertain about the magnitude of both of these effects.[596] To the extent that it occurs, a change in the flow of orders across trading venues may result in differences in the competitive baseline in the market for trading services.

Second, national securities exchanges and ATSs have a number of order types that are based on the NBBO, and so the Commission anticipated that the changes in the NBBO caused by the new round lot definitions may affect how these order types perform and could also affect other orders with which they interact.[597] The Commission stated that these interactions may affect relative order execution quality among different trading platforms, which may in turn affect the competitive standing among different trading venues, with trading venues that experience an improvement/decline in execution quality attracting/losing order flow.[598] However, the Commission stated that it was uncertain of the magnitude of these effects.[599]

Third, the Commission anticipated that, as the NBBO narrows for securities in the smaller round lot tiers, it may become more difficult for the retail execution business of wholesalers to provide price improvement and other execution quality metrics at levels similar to those provided under a 100 share round lot definition.[600] To the extent that wholesalers are held to the same price improvement standards by retail brokers in a narrower spread environment, the wholesalers' profits from executing individual investor orders might decline,[601] and to make up for lower revenue per order filled in a narrower spread environment, wholesalers may respond by changing how they conduct their business in a way that may affect retail brokers. However, the Commission stated that it was uncertain as to how wholesalers may respond to the change in the round lot definition, and, in turn, how retail brokers may respond to those changes, and so was uncertain as to the extent of these effects.[602] If wholesalers do change how they conduct business, it may impact wholesalers' competitive standing in terms of the execution quality offered, particularly to individual investor orders.

Where implementation of the above-described MDI Rules may affect certain numbers in the baseline, the description of the baseline below notes those effects.

2. Current Rule 605 Disclosure Requirements

The Commission believes that there are several areas where market participants' current access to information about execution quality under Rule 605 could be improved. Specifically, currently broker-dealers that are not market centers are not required to report under Rule 605, which limits market participants' ability to assess and compare the execution quality that broker-dealers obtain for their customers. Furthermore, changes in equity market conditions and technological advancements since the Rule was adopted in 2000, such as an increase in the speed of trading, have decreased the relevance of some of the information contained in Rule 605 reports.[603]

(a) Scope of Reporting Entities Under Current Rule 605 Reporting Requirements

The current scope of entities that are required to report under Rule 605 does not include broker-dealers that only route customer orders externally, rather than executing customer orders internally, because they do not meet the definition of market center. As a result, it is difficult for market participants to use the execution quality statistics that are currently available to compare execution quality across these broker-dealers. Furthermore, to the extent that firms that operate two separate market centers co-mingle execution quality information about multiple market centers in Rule 605 reports, this would make it difficult for market participants to assess the execution quality of each market individually.

(1) Broker-Dealers

Currently, broker-dealers that are not market centers are not required to prepare Rule 605 reports,[604] which the Commission believes limits market participants' ability to assess and compare the execution quality that broker-dealers obtain for their customers.

Rule 605 and Rule 606 operate together to allow investors to evaluate what happens to their orders after the investors submit their orders to a broker-dealer for execution.[605] If a market center's Rule 605 reports are representative of the aggregate execution quality that any given broker-dealer receives from that market center, then a customer of a broker-dealer can use that broker-dealer's Rule 606 reports to identify the venues to which the broker-dealer regularly routes orders for execution and use Rule 605 reports to get information on aggregate order

[592] *See id.*

[593] *See id.* at 18725.

[594] *See id.* at 18744.

[595] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18754.

[596] *See id.* at 18745, 18754.

[597] *See id.* at 18748.

[598] *See id.*

[599] *See id.*

[600] *See id.* at 18747.

[601] Individual investor orders typically feature lower adverse selection than other types of orders, such as institutional orders. *See infra* note 608 and accompanying text, describing how it is generally more profitable for any liquidity provider, including wholesalers, to execute against orders with lower adverse selection risk.

[602] *See* MDI Adopting Release, 86 FR 18596 (Apr. 9, 2021) at 18748.

[603] *See supra* notes 12–16 and accompanying text for further discussion.

[604] A broker-dealer may currently be subject to Rule 605 reporting requirements to the extent that the broker-dealer is acting as or operates a market center. However, such reports are required to cover only the orders that the broker-dealer handled within its capacity as a market center. *See supra* notes 179–180 and accompanying text.

[605] *See supra* note 141 and accompanying text.

execution quality at those market centers.[606] However, if broker-dealers receive different execution quality from a given market center, combining Rule 606 and Rule 605 data would not be informative about the execution quality of individual broker-dealers' average execution quality. This is because, since a market center's Rule 605 report is aggregated across all of its broker-dealer customers, it is not possible to determine how execution quality varies across broker-dealers at a particular market center.[607]

To explore this idea, an analysis was performed examining whether wholesalers, which know the identities of the broker-dealers who route orders to them, provide different execution quality to different broker-dealers because of differences in characteristics of their order flows: specifically, adverse selection risk. All else equal, it is generally more profitable for any liquidity provider, including wholesalers, to execute against orders with lower adverse selection risk, due to the reduced risk that prices will move against the liquidity provider.[608] Therefore, wholesalers may provide better execution quality to retail brokers whose order flow exhibits lower adverse selection risk, *e.g.,* in order to attract further order flow from that retail broker. Accordingly, a sample of CAT data[609] between January 1, 2022 and March 31, 2022 in NMS common stocks and ETFs was evaluated to see if execution quality[610] that retail brokers received from wholesalers differed based on the adverse selection risk of the broker-dealers' order flow,[611] as measured using price impact.[612] Retail brokers were grouped into quintiles based on the weighted average percentage price impact of their order flow.

Table 3 shows that the execution quality that retail brokers received from wholesalers systematically decreases as the adverse selection risk of their order flow increases, such that retail brokers with orders with higher average adverse selection risk systematically receive worse execution quality in the form of higher average percentage effective half-spreads and higher average E/Q ratios (*i.e.,* lower price improvement) as

[606] *See supra* section VII.C.1.(b) for a discussion of broker-dealers' current reporting requirements under Rule 606.

[607] For example, consider two broker-dealers, Broker-Dealer 1 and Broker-Dealer 2, which both route orders to a market center (''Market Center A'') according to these broker-dealers' Rule 606 reports. Assume that the orders routed by Broker-Dealer 1 receive consistently below-average execution quality from the wholesaler, while the orders routed by Broker-Dealer 2 receive consistently above-average execution quality. If a customer of Broker-Dealer 1 were to examine Market Center A's Rule 605 report to get a sense of the average execution quality that their Broker-Dealer achieves for their orders, the customer would see only the execution quality statistics aggregated across Broker-Dealers 1 and 2, which would likely reveal that Market Center A offers about average levels of execution quality. However, this would not reveal the worse execution quality that Broker-Dealer 1, and therefore the customer of Broker-Dealer 1, is receiving from the market center.

[608] *See, e.g.,* David Easley, Nicholas M. Kiefer & Maureen O'Hara, *Cream-skimming or profit-sharing? The curious role of purchased order flow,* 51 J. Fin. 811 (1996).

[609] This Commission analysis uses CAT data to examine the execution quality of marketable orders in NMS Common stocks and ETFs that belonged to accounts with a CAT account type of ''Individual Customer'' and that originated from a broker-dealer MPID that originating orders from 10,000 or more unique ''Individual Customer'' accounts during January 2022. The number of unique ''Individual Customer'' accounts associated with each MPID was calculated as the number for unique customer account identifiers with an account customer type of ''Individual Customer'' that originated at least one order during the month of January 2022. Fifty-eight (58) broker-dealer MPIDs were associated with retail brokers originated orders from 10,000 or more unique Individual Customer accounts in January 2022. Account type definitions are available in Appendix G to the CAT Reporting Technical Specifications for Industry Members (*https://catnmsplan.com/*), under the field name ''accountHolderType.'' Account types represent the beneficial owner of the account for which an order was received or originated, or to which the shares or contracts are allocated. Possible types are: Institutional Customer, Employee, Foreign, Individual Customer, Market Making, Firm Agency Average Price, Other Proprietary, and Error. An Institutional Customer account is defined by FINRA Rule 4512(c) as a bank, investment adviser, or any other person with total assets of at least $50 million. An Individual Customer account means an account that does not meet the definition of an ''institution'' and is also not a proprietary account. Therefore, the CAT account type ''Individual Customer'' may not be limited to individual investors because it includes natural persons as well as corporate entities that do not meet the definitions for other account types. The Commission restricted that analysis to MPIDs that originated orders from 10,000 or more ''Individual Customer'' accounts in order to ensure that these MPIDs are likely to be associated with retail brokers to help ensure that the sample is more likely to contain marketable orders originating from individual investors.

[610] Measures of execution quality in this analysis include the percentage effective half-spread and the average E/Q ratio. Percentage effective half-spread is the weighted average of the percentage effective half spread (measured as (execution price—NBBO midpoint at time of order receipt)/NBBO midpoint at time of order receipt). E/Q ratio is the weighted average of the ratio of each transaction's effective spread divided by its quoted spread at the time of order receipt. Time of order receipt is defined as the time the wholesaler first receives the order. The NBBO is based on consolidated market data feed. Weighted averages are calculated by calculating the share weighted value at the individual stock level over the sample (*i.e.,* weighting at the stock level based on the number of shares executed for transactions in the individual stock) and then weighting across stocks based on their total dollar transaction volume during the sample period (*i.e.,* using the stock's total dollar trading volume as the weight when averaging the share weighted average stock values).

[611] The analysis employed filters to clean the data and account for potential data errors. Retail brokers' fractional share orders with share quantity less than one share were excluded from the analysis. The analysis included market and marketable limit orders that were under $200,000 in value and that originated from one the 58 retail broker MPIDs and were received by a market center that was associated with one of the six wholesalers CRD numbers (FINRA's Central Registration Depository number) during some point in the order's lifecycle. Orders that were received by the wholesaler or executed outside of normal market hours were excluded. Orders were also excluded if they had certain special handling codes so that execution quality statistics would not be skewed by orders being limited in handling by special instructions (*e.g.,* pegged orders, stop orders, post only orders, etc.) Orders identified in CAT as Market and Limit orders with no special handling codes or one of the following special handling codes were included in the analysis: NH (not held), CASH (cash), DISQ (display quantity), RLO (retail liquidity order), and DNR (do not reduce). These special handling codes were identified based on their common use by retail brokers and descriptions of their special handling codes. The marketability of a limit order was determined based on the consolidated market data feed NBBO at the time a wholesaler first receives the order. Limit orders that were not marketable were excluded. The dollar value of an order was determined by multiplying the order's number of shares by either its limit price, in the case of a limit order, or by the midpoint of the consolidated market data feed NBBO at the time the order was first received by a wholesaler, in the case of a market order. The analysis includes NMS Common Stocks and ETFs (identified by security type codes of 'A' and 'ETF' in NYSE TAQ data) that are also present in CRSP data from CRSP 1925 US Indices Database and CRSP 1925 US Stock Database, Ctr. Rsch. Sec. Prices, U. Chi. Booth Sch. Bus. (2022). Price improvement, effective spreads, realized spreads, quoted spreads, and price impacts were winsorized if they were greater than 20% of a stock's VWAP during a stock-week.

[612] By measuring the difference between the transaction price and the prevailing market price some fixed period of time after the transaction (*e.g.,* one minute), price impact measures the extent of adverse selection costs faced by a liquidity provider. For example, if a liquidity provider provides liquidity by buying shares from a trader who wants to sell, thereby accumulating a positive inventory position, if the liquidity provider wants to unwind this inventory position by selling shares in the market, they will incur a loss if the price has fallen in the meantime. In this case, the price impact measure will be positive, reflecting the liquidity provider's exposure to adverse selection costs. In this analysis, percentage price impact is the weighted average of the percentage one minute price impact half spread (measured as (NBBO midpoint one minute after execution—NBBO midpoint at time of order receipt)/NBBO midpoint at time of order receipt). *See supra* note 610 for a definition of the time of order receipt and information about how weighted averaged were calculated in this analysis.

[613] This analysis uses data from prior to the implementation of the MDI Rules and specific numbers may differ following the implementation of the MDI Rules. In particular, for stocks with prices over $250, quoted spreads and price improvement statistics are expected to narrow because they will be measured against a narrower NBBO. The effects on effective spread, price impact, and realized spread statistics in these stocks is uncertain, because they are measured against the NBBO midpoint, and the Commission is uncertain how this will be affected. *See supra* section VII.C.1.(d)(2). However, the Commission does not anticipate that the existence of a negative relation between the retail brokers' adverse selection risk and the execution quality that they receive from wholesalers described here would be affected by the implementation of the MDI Rules.

compared to broker-dealers with orders with lower average adverse selection risk.[613] This highlights that wholesalers provide different execution quality to different retail brokers, in this case depending on the adverse selection risk of their orders. This is likely to have a large effect on the execution quality received by retail brokers, as an analysis of Rule 606 data found that retail brokers route more than 87% of the individual investor orders that they handle to wholesalers.[614] However, since a wholesaler's Rule 605 report is aggregated across all of its broker-dealer customers, this variation in execution quality across retail brokers cannot be determined by matching its Rule 605 report to broker-dealers' routing information from their Rule 606 reports.

TABLE 3—AVERAGE WHOLESALER EXECUTION QUALITY RECEIVED BY RETAIL BROKER QUINTILES, JANUARY–MARCH 2022

Broker-dealer quintile	Percentage price impact (bps)	Percentage effective half-spread (bps)	E/Q ratio
1	−1.04	2.86	0.43
2	0.48	1.87	0.46
3	0.79	2.15	0.48
4	1.32	3.48	0.61
5	3.85	7.24	0.88

Table 3: Average Wholesaler Execution Quality Received by Retail Broker Quintiles, January–March 2022. This table summarizes how execution quality varies in NMS Common Stocks and ETFs based on a retail broker MPID's price impact by grouping 58 retail broker MPIDs identified according to the procedure described in *supra* note 609 in NMS Common Stocks and ETFs into quintiles based on their average price impact. Each retail broker MPID's price impact is determined by share weighting its average percentage price impact half spread within an individual NMS common stock or ETF and then averaging across stocks using the weighting of the dollar volume the retail broker executed in each security (dollar volume weighted); this measure of price impact is then used to sort retail broker MPIDs into quintiles. Within each quintile, average percentage price impacts, percentage effective half-spreads, and E/Q ratios are calculated as described in *supra* notes 610 and 612. *See supra* note 609 for dataset description and *supra* note 611 for details on the sample and filters used in this analysis. This analysis uses data from prior to the implementation of the MDI Rules and specific numbers may differ following the implementation of the MDI Rules. *See supra* note 613 and section VII.C.1.(d).

(2) Reporting Entities That Operate SDPs

When a market center also operates a SDP, co-mingling SDP activity with other market center activity may obscure or distort information about the market center's execution quality in their Rule 605 reports, making it more difficult for market participants to observe the execution quality of each separate trading venue. SDPs are sometimes called ''ping pools,''[615] reflecting that institutional investors use these venues to ''ping'' (*i.e.,* submit a small order in search of hidden liquidity) SDPs, often using Immediate or Cancel (IOC) orders. IOC orders typically have different execution profiles than other types of orders, including lower fill rates.[616] Combining information on orders submitted to a market center's SDP along with its other orders will therefore effect a downwards skew on the market center's fill rates, and analogously an upward skew on the SDP's fill rates. This may particularly be the case for wholesalers who combine the orders submitted to their SDP with orders that are internalized or executed on a riskless principal basis,[617] since SDP activity represents a significant portion of their trading volume.[618] Also, since the information on executions in SDPs largely reflects institutional orders, combining information on SDP orders along with other orders would tend to obscure information that is particularly relevant for institutional investors or broker-dealers handling institutional investors' orders in assessing differences across these market centers. To the extent that institutional investors are less able to observe and compare differences in execution quality across market centers as a result, this may reduce incentives for these market centers to compete for institutional investor orders on the basis of execution quality.

(b) Coverage of Orders Under Current Rule 605 Reporting Requirements

The Commission believes that current Rule 605 reporting requirements exclude execution quality information about some order sizes and types that are relevant to market participants.

To estimate the percentage of shares that are currently excluded from Rule 605 reporting requirements and the driving factor behind their exclusions (*i.e.,* whether they are excluded based on their submission time, type, or size), data from the Tick Size Pilot B.I Market

[614] These numbers are based on an analysis of the percentage of market orders, marketable limit orders, non-marketable limit orders, and other orders that 46 retail brokers route to different types of venues in Q1 2022 based on their Rule 606 reports. Consistent with Rule 606, routing statistics are aggregated together in Rule 606 reports based on whether the stock is listed in the S&P 500 index. The 46 broker-dealers were identified from the 58 retail brokers identified according to the procedure described in *supra* note 609. This analysis uses the retail broker's 606 report if they publish one, or the Rule 606 report of their clearing broker if they did not produce a Rule 606 report themselves (the sample of 46 broker-dealer Rule 606 reports include some broker-dealers that were not included in the CAT retail analysis because some clearing broker Rule 606 reports are included). Some broker-dealers reported handling orders only on a not held basis and did not have any Rule 606 reports. Because Rule 606 only include percentages of where their order flow is routed and not statistics on the number of orders, the reports are aggregated together using a weighting factor based on an estimate of the number of non-directed orders each broker-dealer routes in each security type each month. The number of non-directed orders is estimated separately for S&P 500 and non-S&P 500 stocks by dividing the number of non-directed market orders originating from a retail broker in each stock type in a given month, which is estimated from CAT data, by the percentage of market orders as a percent of non-directed orders in the retail broker's Rule 606 report for that stock type in the same month (the weight for a clearing broker consists of the aggregated orders from the introducing brokers in the CAT analysis that utilize that clearing broker). The resulting statistics show that broker-dealers routed 87.3% of orders in S&P 500 stocks and 87.9% of orders in non-S&P 500 stocks to wholesalers, as compared to 9.1% and 8.5%, respectively, to national securities exchanges.

[615] *See, e.g.,* Annie Massa, *Trader VIP Clubs, 'Ping Pools' Take Dark Trades to New Level,* Bloomberg, (Jan. 16, 2018, 5:00 a.m.), *available at https://www.bloomberg.com/news/articles/2018-01-16/trader-vip-clubs-ping-pools-take-dark-trades-to-new-level#xj4y7vzkg.*

[616] *See infra* section VII.C.2.(c)(7) for discussion of differences between marketable IOC order executions and the executions of other marketable order types.

[617] *See infra* section VII.C.2.(c)(8) for a discussion on how the treatment of wholesalers' riskless principal trades in Rule 605 reports may also obscure information on execution quality.

[618] *See infra* note 769 and accompanying text, describing that the combined trading volume of the affiliated SDPs of the two most active wholesalers accounted for over 4% of total U.S. consolidated trading volume in 2021.

Quality dataset,[619] which had much broader reporting requirements than Rule 605,[620] was analyzed for a period from April 2016 to March 2019. As a first step, approximately 25% of orders are estimated to be excluded from Rule 605 requirements as they are flagged as having special handling requests. A breakdown of the remaining submitted share volume (*i.e.,* after excluded special handling orders) is presented in Figure 2, and shows that around 2.2% of shares are currently excluded from Rule 605 reporting requirements due to having effective times outside of regular trading hours. A further 51.6% of shares are excluded because they were of an order type that is currently excluded from Rule 605 reporting requirements.[621] An additional 11.3% of the remaining order volume are excluded from Rule 605 coverage because of the exclusion of orders less than 100 shares and larger-sized orders. This leaves only around a third of share volume that is currently eligible to be included in Rule 605.[622]

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Figure 2: Rule 605 Coverage, by Submission Time, Order Type, and Order Size, April 2016–March 2019

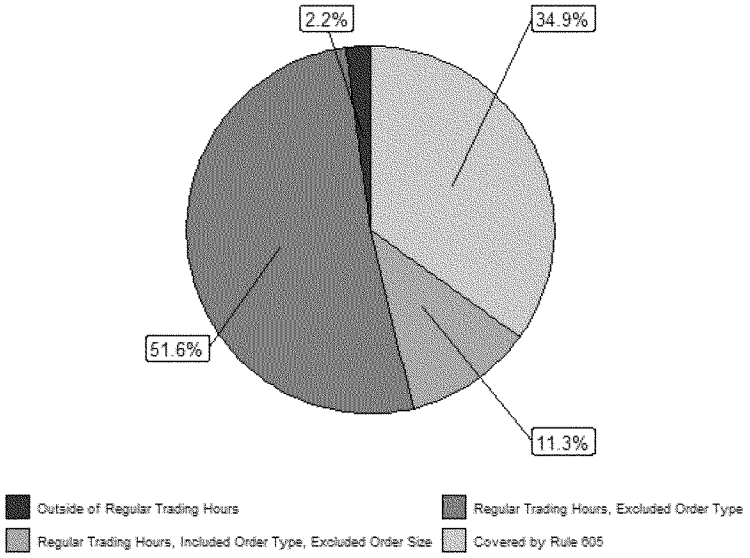

Figure 2: Rule 605 Coverage, by Submission Time, Order Type, and Order Size, April 2016 – March 2019. This figure shows the additional percentage of orders that are excluded from Rule 605 reporting requirements after the sequential addition of various exclusions, using data from the Tick Size Pilot B.I Market Quality dataset, for all pilot and control stocks and for the entire pilot period from April 2016 to March 2019. See supra note 619 for dataset description.

In order to examine changes in Rule 605 coverage, the Commission compared the number of executed shares in one market center's Rule 605 reports between October 2003 and February 2021 to data on that market center's execution volume retrieved from TAQ.[623] Figure 3 shows that an estimated 50% of shares executed during regular market hours were included in Rule 605 reports as of February 2021,[624] and shows that this number has been on a slightly downward trend since around mid-2012.[625]

[619] *See* Securities Exchange Act Release No. 72460 (June 24, 2014), 79 FR 36840 (June 30, 2014) (Order Directing the Exchanges and the Financial Industry Regulatory Authority To Submit a Tick Size Pilot Plan) (''Tick Size Pilot Plan''). The Tick Size Pilot B.I Market Quality dataset contains information for approximately 2,400 small cap stocks for a period from April 2016 to March 2019. As the Tick Size Pilot data only collected data for small cap stocks, results using this dataset are not necessarily representative of all stocks.

[620] *See* Appendix B and C Requirements and Technical Specifications, *available at https://www.finra.org/sites/default/files/Appendix_B_C_Reporting_Requirements_version2.pdf.* Order types that are included in the Tick Size Pilot dataset that are not covered by Rule 605 include Resting Intermarket Sweep orders, Retail Liquidity Providing orders, Midpoint Passive Liquidity orders, Not Held orders, Clean Cross orders, Auction orders, and orders that became effective when an invalid NBBO was in effect. Order sizes included in the Tick Size Pilot dataset that are not covered by Rule 605 include orders for between 1–99 shares and orders for 10,000+ shares. *See also* Tick Size Pilot Program, Appendix B and C Statistics Frequently Asked Questions, *available at https://www.finra.org/sites/default/files/Tick-Size-Pilot-Appendix-B-and-C-FAQ.pdf* (''Tick Size Pilot FAQs''), answer to Question 2.1. Furthermore, the Tick Size Pilot dataset includes separate statistics for orders submitted outside of regular trading hours (trading sessions E and BE). *See* Tick Size Pilot FAQs, answer to Question 4.11.

[621] Of the shares excluded on the basis of order type, the largest percentage (73.6%) are excluded because they are not-held orders.

[622] An additional percentage of this order flow is also excluded from coverage due to the exclusion of stop-loss orders and non-exempt short sales, but these are not one of the listed order types in the Tick Size Pilot dataset and therefore it is not possible to exclude them. *See* Appendix B and C Requirements and Technical Specifications, *available at https://www.finra.org/sites/default/files/Appendix_B_C_Reporting_Requirements_version2.pdf.*

[623] The number of shares traded on NYSE was collected from the intraday TAQ Consolidated Trade files for the period from October 2003 to February 2021 for the entire universe of TAQ securities. Trades outside of regular trading hours were excluded. This dataset includes trades at the opening and closing auction. Due to that fact that odd-lot trades are only included in TAQ from December 2013 onwards, the Commission excluded odd-lot trades from the dataset to avoid a mechanical decrease in coverage following their inclusion into the dataset. Rule 605 data for the same period was provided by IHS Markit.

[624] The Commission focused on the data from one market center (NYSE) because of the availability of a long time series for NYSE Rule 605 data. The Commission selected NYSE due to its large market share and ease of identifying this market center in both Rule 605 and TAQ data. Note that these results are not necessarily representative of all market centers and the results for other market centers may be different.

[625] The implementation of the MDI Rules may result in a change in the flow of orders across

Figure 3: Rule 605 Coverage Compared to TAQ, for the NYSE, October 2003–February 2021

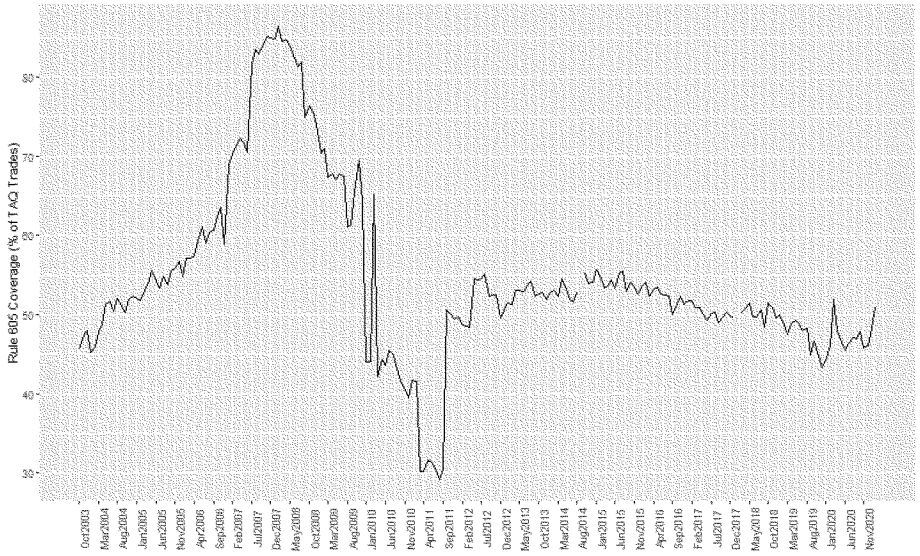

Figure 3: Rule 605 Coverage Compared to TAQ, for the NYSE, October 2003 – February 2021. This figure plots the number of shares executed on NYSE as reported in monthly Rule 605 reports, divided by the monthly total number of shares traded on NYSE as reported in TAQ. Note that the number of executed shares reported in Rule 605 reports is first divided by two, as in Rule 605 data each trade is reported twice: once for the buy-side, and once for the sell-side of the trade. Due to the presence of outliers, data for September 2014 were removed. See supra note 623 for dataset descriptions. This analysis uses data from prior to the implementation of the MDI Rules and specific numbers reported may be different following the implementation of the MDI Rules. See supra note 625 and section VII.C.1.d)(2).

Figure 3 shows that Rule 605 coverage has varied significantly over time, likely the result of market and regulatory events that may have affected the usage of orders types that are excluded from or included in the definition of a covered order. For example, equity markets have seen an increase in the usage of ISOs after Regulation NMS [626] and an increase in participation in national securities exchanges' closing auctions,[627] both of which likely have decreased Rule 605 coverage over time.[628]

The following sections will discuss the various facets of Rule 605 reporting requirements that lead to the exclusion of orders from reporting requirements and the extent to which these orders may be relevant for an assessment of execution quality, including excluded order sizes, ISOs, stop orders, non-exempt short sale orders, away-from-the-quote limit orders, and orders submitted outside of regular trading hours.

(1) Orders Less Than 100 Shares and Larger-Sized Orders

Currently, orders of certain sizes are excluded from Rule 605 reporting requirements, including orders for less than 100 shares and larger-sized orders.[629] Taken together, data on the usage of orders of these sizes implies that a large percentage of orders and trades is currently excluded from Rule 605 reporting requirements on the basis on order size, thus limiting the extent to which reporting entities compete for customers on the basis of execution quality.

(a) Orders Less Than 100 Shares

Due to the Rule's current exclusion of orders that are sized smaller than 100 shares, which excludes all odd-lot orders and, in some cases, round lot orders where a round lot is less than 100 shares, the Commission believes that Rule 605 reports are missing information about an important segment of order flow.

The rise in the use of odd-lot orders is a phenomenon that has been well-

trading venues, which may result in numbers that are different from those reported here. *See supra* section VII.C.1.(d)(2) for further discussion. However, the Commission does not believe that the MDI Rules would significantly affect the proportion of exchange volume that is covered by Rule 605 reporting requirements.

[626] *See infra* note 1021 and corresponding text. Marketable ISOs submitted at prices worse than the NBBO are excluded from Rule 605 reporting requirements.

[627] *See, e.g.,* Vincent Bogousslavsky & Dmitriy Muravyev, *Who trades at the Close? Implications for Price Discovery and Liquidity* (working paper Dec. 16, 2021), *available at https://ssrn.com/abstract=3485840* (retrieved from SSRN Elsevier database), showing that closing auctions accounted for 7.5% of daily volume in 2018, up from 3.1% in 2010. The definition of ''covered orders'' that are subject to Rule 605 reporting requirements excludes orders for which customers requested special handling, including orders to be executed at a market opening price or a market closing price. *See* 17 CFR 242.600(b)(22).

[628] Other market and regulatory changes that may have impacted Rule 605 coverage over time include the increased use of automated orders (*e.g.,* NYSE switching from a floor-based trading model to a hybrid model), which may have increased coverage during the period of 2003–2007 due to an increase in the number of ''held'' orders (*see* 2018 Rule 606 Amendments Release, 83 FR 58338), and changes in the use of block orders. Note that the use of odd-lots and orders for less than one share have also changed substantially over time, but these orders types are excluded from our analysis of TAQ data.

[629] *See* 17 CFR 242.605(a)(1). *See also supra* note 40 and corresponding text for a definition of the current order size categories included in Rule 605 reporting requirements.

documented in modern markets.[630] An analysis of data from the SEC's MIDAS analytics tool[631] confirms that the use of odd-lots has increased substantially as a percentage of total on-exchange trades within the past decade. Figure 4 plots monthly averages of the odd-lot rate (the number of odd-lot trades as a percentage of the total on-exchange trades) across stock price deciles, showing that the relative number of odd-lot trades has increased dramatically between 2012 and 2022, for high-priced stocks in particular.[632] Specifically, the figure shows that the odd-lot rate increased from around 0.6% to 2.32% for the lowest-price stocks (Decile 1), and from 10.6% to 40.9% for the highest-priced stocks (Decile 10).

Figure 4: Odd-Lot Rates by Stock Price Deciles, January 2012–March 2022

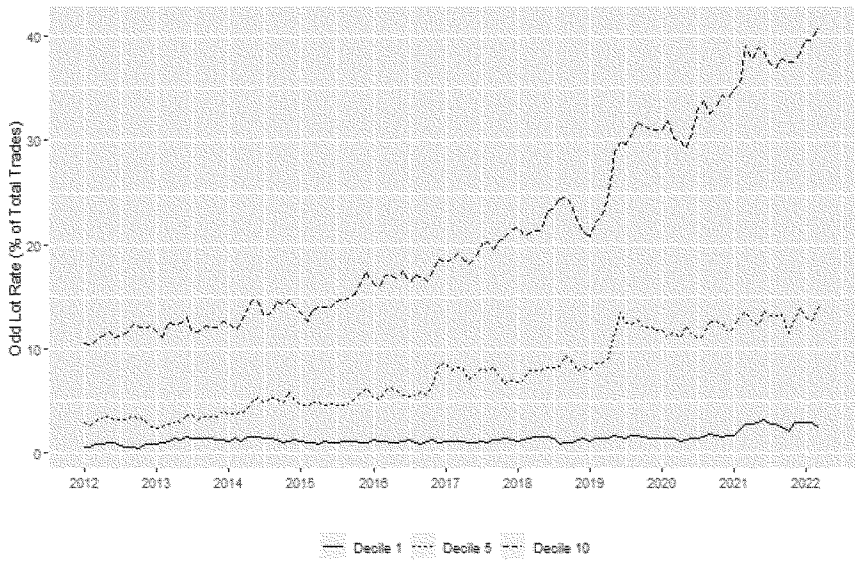

Figure 4: Odd-Lot Rates by Stock Price Deciles, January 2012 – March 2022. This figure plots the odd-lot rate (the number of odd-lot trades on national securities exchanges as a percentage of the total number of on-exchange trades) across stock price deciles for the period from January 2012 to March 2022. For brevity the plot contains data for the smallest (Decile 1), median (Decile 5) and largest (Decile 10) stock price deciles. See supra note 631 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 632 and section VII.C.1.d)(2).

There is evidence that these high percentages are not only the case for odd-lot trades, but for odd-lot orders as well. Using data from January to March 2021, a recent academic working paper found that the rate of orders sized between 1 and 100 shares ranges from 5.6% of all submitted orders for less than 500 shares in the lowest-priced stocks, to 46.9% of all such orders in the highest-priced stocks.[633] This is supported by an analysis of the distribution of order sizes using order submission data from MIDAS for a sample of 80 stocks during the month of March 2022.[634] Confirming results from Figure 4 examining the time series of odd-lot order rates, Figure 5 shows that odd-lot orders make up a significant percentage of orders (18.2%), although these orders are only a small percentage of total submitted share volume (2.8%).[635]

Figure 5: Distribution of NMLOs Across Order Size Buckets, March 2022

[630] *See, e.g., supra* note 273 and accompanying text, describing how market participants have stated that odd-lots make up a majority of all trades. Until the round lot definition adopted pursuant to the MDI Rules is implemented, round lots continue to be defined in exchange rules. For most NMS stocks, a round lot is defined as 100 shares. Following the implementation of the MDI Rules, for stocks with prices greater than $250, a round lot will be defined as consisting of between 1 and 40 shares, depending on the tier. *See supra* note 577 for a definition of these tiers.

[631] *See* dataset Summary Metrics by Decile and Quartile, SEC, *available at https://www.sec.gov/marketstructure/downloads.html.* The data is available between January 2012 and March 2022.

[632] The number of odd-lot trades may be higher following the implementation of the MDI Rules due to the availability of odd-lot quotes in consolidated market data, which may result in numbers that are different from those reported here. For stocks priced above $250, the change in the definition of round lots may in result in fewer odd-lot trades, as more trades will be incorporated into the definition of round lots. *See supra* section VII.C.1.(d)(2) for further discussion.

[633] *See* Bartlett, et al. The authors divide their sample of stocks into five price-based buckets, with stocks in the lowest-priced group defined as those priced at $20.00 or less, and stocks in the highest-priced group priced at $250.00 or more.

[634] This dataset consists of NMLO submission data collected from MIDAS and includes the posted orders and quotes on 11 national securities exchanges, for a sample of 80 stocks, across all trading days in March 2022. For more details on this dataset, *see https://www.sec.gov/marketstructure/midas-system.* The sample of stocks is chosen to be a representative sample in terms of market capitalization and price (calculated using price and shares outstanding data from CRSP on the last trading day in February 2021, from CRSP 1925 US Stock Database, Ctr. Rsch. Sec. Prices, U. Chi. Booth Sch. Bus. (2022)). Note that the MIDAS dataset only includes displayed orders, and includes some order types that are currently excluded from Rule 605 reports, such as short sale orders and orders with special handling requests, as it is not possible to distinguish these orders in MIDAS.

[635] This data only includes information about NMLOs, and therefore information about the sizes of market orders and marketable limit orders is not available.

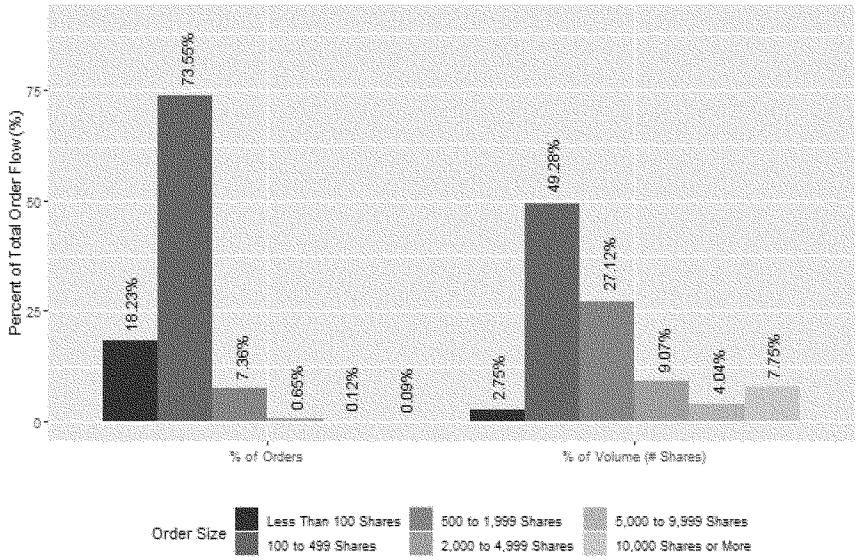

Figure 5: Distribution of NMLOs across Order Size Buckets, March 2022. This figure plots the percentage of NMLOs that can be categorized into the existing Rule 605 order size categories, using order submission data from MIDAS. Percentages are expressed relative to the total number of orders and the total number of shares. See supra note 634 for dataset description.

Market commentators have attributed this rise in odd-lot trading to a variety of factors. For example, an increase in the number of high-priced stocks caused order sizes to decrease in these stocks, where trading in larger order sizes is more expensive.[636] Another factor is a rise in algorithmic trading, which chops orders into many smaller orders. Broker-dealers that handle institutional orders often make use of odd-lot orders as a result of trading algorithms that split larger parent orders into smaller child orders to reduce the market impact of their trades.[637] High frequency traders also use inside the spread odd-lot orders as a means of probing for hidden liquidity or detecting forthcoming order flow. Academic papers have found evidence that high frequency traders and other institutional investors make up a substantial fraction of odd-lot trades.[638] Another potential reason for the increase in odd-lot trading is the increasing presence of trading by individual investors, who tend to use smaller order sizes.[639] Therefore, by not capturing information related to these orders, Rule 605 reports are missing information about potentially important segments of order flow from both individual and institutional investors.

(b) Orders Less Than a Share

Due to the Rule's current exclusion of fractional orders that are smaller than one share,[640] the Commission believes that Rule 605 reports are missing information about an increasingly important segment of individual investor order flow. Similar to the increase in odd-lots, one reason for the increase in the use of fractional shares is the increasing presence of trading by individual investors, who tend to use smaller order sizes.[641] The past few years have seen increasing attention paid to fractional shares, as more and more retail brokers are offering this functionality.[642] The Commission understands that there are at least two different ways that retail brokers handle fractional trades: first, they can rely on their clearing firm, which will often ''round up'' the fractional part of the order and deposit the residual in an internal ''fractional inventory account''; and second, they can execute fractional trades against their own inventory.[643]

An estimation of the percentage of orders that are currently excluded from Rule 605 reporting requirements because they are smaller than one share is difficult, as these orders are executed off-exchange and therefore not included in public datasets. However, an analysis using data from CAT[644] confirms that

[636] *See, e.g.,* Phil Mackintosh, ''*Odd Facts About Odd-Lots,*'' (Apr. 2021), *available at https://www.nasdaq.com/articles/odd-facts-about-odd-lots-2021-04-22.*

[637] *See infra* section VII.C.3.(a)(1)(b), discussing the practice of broker-dealers handling institutional parent orders as not held orders and splitting them up into child orders.

[638] *See, e.g.,* Hardy Johnson, Bonnie F. Van Ness & Robert A. Van Ness, *Are all odd-lots the same? Odd-lot transactions by order submission and trader type,* 79 J. Banking & Fin. 1(2017); Maureen O'Hara, Chen Yao & Mao Ye, *What's not there: Odd lots and market data,* 69 J. Fin. 2199 (2014).

[639] *See, e.g.,* Bartlett et al. (2022); Matthew Healey, *An In-Depth View Into Odd Lots,* Chi. Bd. Options Exch. (Oct. 2021), *available at https://www.cboe.com/insights/posts/an-in-depth-view-into-odd-lots/.*

[640] Note that orders greater than one share can also be fractional. If the fractional order is for more than just a single share (*e.g.,* 2.5 shares), the broker-dealer may internalize the fractional component (0.5 shares) and reroute the whole component (2 shares) to a market center for execution.

[641] *See, e.g.,* Kevin L. Matthews, *What are Fractional Shares and How do They Work?,* Bus. Insider (Sept. 21, 2022), *available at https://www.businessinsider.com/personal-finance/fractional-shares.*

[642] *See, e.g.,* Rick Steves, *Fractional Shares: Experts Weight in Amid Exploding Retail Trading Volumes,* Fin. Feeds (June 7, 2021, 8:25 a.m.), *available at https://financefeeds.com/fractional-shares-experts-weigh-in-amid-exploding-retail-trading-volumes/,* which shows that trading volume increased substantially (in one case, more than 1,400%) for brokers after they introduced the use of fractional shares.

[643] *See, e.g.,* Robert P. Bartlett, Justin McCrary & Maureen O'Hara, *A Fractional Solution to a Stock Market Mystery* (working paper July 20, 2022), *available at https://ssrn.com/abstract=4167890* (retrieved from SSRN Elsevier database). Note that, as fractional shares fall below the smallest order size category in current Rule 605, a broker-dealer that currently exclusively executes fractional shares would be a market center, but would not be required to file Rule 605 reports.

[644] This dataset contains CAT records capturing introducing and trading activity in March 2022, including fractional NMS orders that were eventually executed on- and off-exchange. As individual fractional orders are often aggregated into a single representative order before routing and execution, staff looked at the information specific to the originating customer orders (designated as MENO orders events in CAT) that were eventually

Continued

levels of fractional trading are mostly the result of individual investor trading: in March 2022, there were 31.67 million orders for less than one share that eventually received an execution, the overwhelming majority (92%) of which were submitted by accounts attributed to ''Individual Customers.'' [645] While these orders only represented a small fraction (around 1.4%) of total executed orders, they represented a much higher fraction (10.4%) of executions received by individual investors.[646] Therefore, by not capturing information related to these orders, Rule 605 reports are missing information about an important segment of individual investor trades.

(c) Larger-Sized Orders

Due to the Rule's current exclusion of orders that are larger than 10,000 shares,[647] the Commission believes that Rule 605 reports are missing information about another important segment of order flow. The Commission understands that practices have evolved such that most broker-dealers that service institutional investors use SORs to break up these customers' large parent orders into smaller-sized child orders.[648] As shown in Figure 6, which plots the number of shares associated with trades that are for 10,000 or more shares as a percent of total executed shares,[649] the rate of larger-sized trades declined from more than 25% in late 2003 to 11.3% as of March 2022. This decline is likely the result of the increased use of SORs, though other market changes such as the overall increase in stock prices may play a part. However, the rate of larger-sized trades has been increasing since August 2011, when the rate of larger-sized trades was around 6.7%.

Figure 6: Larger-Sized Trades as a Percent of Total Executed Shares, September 2003–March 2022

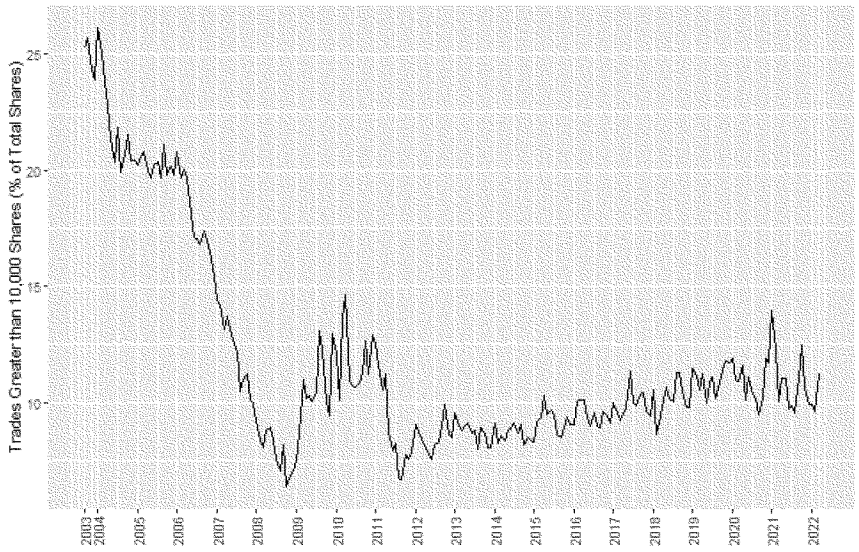

Figure 6: Larger-Sized Trades as a Percent of Total Executed Shares, September 2003 – March 2022. This figure plots the monthly number of shares associated with trades that are for 10,000 shares or more, divided by the total number of executed shares, using data from TAQ. See supra note 649 for dataset description.

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Furthermore, larger-sized orders make up a non-negligible percent of order flow. Figure 5, which plots the distribution of NMLO sizes in order submission data from MIDAS for the month of March 2022, shows that, while NMLOs of 10,000 or more shares made up only 0.09% of order flow in terms of number of orders, they made up nearly 7.8% of order flow in terms of share volume. However, some, or possibly most, of these larger-sized orders may be not held to the market, so would not be required to be included in Rule 605 reports even without the exemptive relief.[650]

(2) Orders Submitted With Stop Prices

The Commission believes that the current exclusion of orders with stop prices from the definition of ''covered order'' excludes orders that are likely relevant for investors. A stop order, also referred to as a stop-loss order, is an order to buy or sell a stock once the price of the stock reaches the specified price, known as the stop price. When the stop price is reached, a stop order becomes a market order, or a limit order in the case of so-called stop limit

executed, and, separately, examined the information specific to the executions of the orders (designated as MEOT for off-exchange or EX and EOT for on-exchange events in CAT) that could be linked to the fractional MENOs either directly or via a representative order.

[645] *See supra* note 609 for a definition of account types in CAT.

[646] In terms of notional volume, executed fractional orders make up around 0.17% of total executed dollar volume and 1.4% of individual investor executed dollar volume.

[647] *See supra* note 281 and corresponding discussion describing the exemptive relief provided by the Commission in 2001 for orders with a size of 10,000 shares or greater.

[648] *See infra* section VII.C.3.(a)(1)(b) further discussing the practice of broker-dealers handling institutional parent orders as not held orders and splitting them up into child orders.

[649] This analysis uses data from intraday TAQ Consolidated Trade files for the period from September 2003 to March 2022 for the entire universe of TAQ securities. Plotted is the monthly number of shares associated with trades that are for 10,000 shares or more, divided by the total number of executed shares. The data is limited to trades with sales conditions indicating regular trades, including regular trades with no associated conditions, automatic executions, intermarket sweep orders, and odd lot trades. *See* NYSE Daily TAQ Client Specification, *available at https://www.nyse.com/publicdocs/nyse/data/Daily_TAQ_Client_Spec_v3.3.pdf.*

[650] *See supra* note 60 and accompanying text discussing broker-dealers' requirements under Rule 606(b)(3) to provide individualized reports of execution quality upon request for not held orders.

orders.[651] The treatment of stop orders varies across broker-dealers and market centers.[652]

The Commission understands that stop orders resting on national securities exchanges have been uncommon, and the vast majority of stop orders are handled by broker-dealers.[653] Some national securities exchanges have eliminated this order type from their rule book.[654] Furthermore, the use of stop orders has typically been associated with individual investors,[655] who use these orders to try to protect a gain or to limit potential losses of a currently held position.[656] Table 4 breaks down a sample of stop loss order volume by account type and stop loss order type using CAT data for March 2022.[657] The data confirms that the use of stop orders by institutional investors is very rare (only 0.23% of market and 0.0003% of limit orders are submitted with stop prices), while their use is relatively more common for individual investors, particularly for market orders, around 6.44% of which are submitted with stop prices.

TABLE 4—STOP ORDER VOLUME BY ACCOUNT AND ORDER TYPES, MARCH 2022

Investor and order type	Orders with stop prices (% of total orders)	Types of stop orders (% of total stop orders)			
		Stop/ stop limit	Stop on quote/stop limit on quote	Trailing stop/ trailing stop limit	Total
Institutional:					
Market	0.23	49.4	0.5	11.3	61.3
Limit	0.0003	37.8	0.4	0.5	38.7
Individual:					
Market	6.44	68.3	9.0	10.3	87.6
Limit	0.03	10.1	1.7	0.6	12.4

Table 4: Stop Order Volume by Account and Order Types, March 2022. This table shows the percentage of orders that are submitted with stop prices (as a percentage of total orders) separately for accounts associated with institutional and individual investor types and for market and limit orders, using a sample of CAT data for all NMS stocks from March 2022. Also shown is a breakdown of stop order submission volume according to six common types of stop orders. *See supra* note 657 for information on the dataset and identification of stop orders.

(3) Non-Exempt Short Sale Orders

Commission staff has taken the position that staff would view all non-exempt short sale orders as special handling orders.[658] As a result, these orders are currently not included as part of Rule 605 statistics, which may exclude a large portion of orders that are likely relevant for market participants.

Non-exempt short sale orders are orders that are subject to price restrictions under Rule 201 of Regulation SHO,[659] which contains a short sale circuit breaker that, when triggered by a price decline of 10% or more from a covered security's prior closing price, imposes a restriction on the price at which the covered security may be sold short (*i.e.,* must be above the current national best bid). Once triggered, the price restriction will apply to short sale orders in that security for the remainder of the day and the following day, unless the short sale order is ''short exempt.'' [660] Since a non-exempt short sale that is subject to a price restriction is only allowed to take place at least one tick above the NBB, these could be ''orders to be executed on a particular type of tick or bid,'' which would exclude them from the definition of ''covered orders.'' [661] The exclusion of tick-sensitive orders from Rule 605 reporting requirements ensures that these orders do not skew execution quality statistics, as the prevention of

[651] *See, e.g.,* SEC, *Types of Orders, available at https://www.investor.gov/introduction-investing/investing-basics/how-stock-markets-work/types-orders* and the definitions of stop order and stop limit order in FINRA Rule 5350(a), *available at https://www.finra.org/rules-guidance/rulebooks/finra-rules/5350.* The stop price can be the last sale price, or a quotation in the case of stop on quote or stop limit on quote orders. The stop price may also be permitted to increase or decrease by a predetermined amount or formula in the case of trailing stop and trailing stop limit orders.

[652] For example, one broker-dealer stated that some of the market centers to which it routes orders may impose price limits to prevent stop orders from being triggered by potentially erroneous trades, and that these price limits vary by market center. *See Trading FAQs: Order Types,* Fidelity, *available at https://www.fidelity.com/trading/faqs-order-types.* Another brokerage firm states that, depending on to which market center a stop limit order is presented, a stop limit order can be activated as a limit order using either a transaction or quotation as the triggering event. *See Best Execution of Equity Securities,* UBS (June 2021), *available at https://www.ubs.com/content/dam/static/wmamericas/bestexecution.pdf.*

[653] *See, e.g.,* Memorandum from SEC Division of Trading and Markets on Certain Issues Affecting Customers in the Current Equity Market Structure (Jan. 26, 2016), *available at https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac-012616.pdf,* citing NYSE Order Type Usage Chart illustrating that stop orders, along with good-til-canceled, agency cross and manual orders, accounted for only 0.19% of total matched volume for Q3 2015 and Q4 2015. *See also How to Survive the Markets Without Stop-Loss Orders,* NASDAQ (Dec. 2, 2015), *available at https://www.nasdaq.com/articles/how-survive-markets-without-stop-loss-orders-2015-12-02,* stating that stop orders represent around 2% of all orders placed on national securities exchanges.

[654] *See, e.g.,* Securities Exchange Act Release No. 76649 (Dec. 15, 2015), 80 FR 79365 (Dec. 21, 2015) (SR–NYSE–2015–60) (''NYSE Notice''); Securities Exchange Act Release No. 76655 (Dec. 15, 2015), 80 FR 79382 (Dec. 21, 2015) (SR–NYSEMKT–2015–103).

[655] *See, e.g.,* Annie Massa & Sam Mamudi, *Black Rock Calls for Halting Stock Market to Avoid Volatility,* Bloomberg Bus. (Oct. 7, 2015), *available at http://www.bloomberg.com/news/articles/2015-10-07/blackrock-calls-for-halting-the-stock-market-to-avoid-volatility* (citing industry concerns with ''the widespread use of stop orders by retail investors'').

[656] *See, e.g.,* Memorandum from SEC Division of Trading and Markets on Certain Issues Affecting Customers in the Current Equity Market Structure (Jan. 26, 2016), *available at https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac-012616.pdf.* Meanwhile, professional or institutional investors are more likely to have the resources to be able to actively monitor their orders, and are therefore less likely to use stop orders. *See, e.g., How to Survive the Markets Without Stop-Loss Orders,* NASDAQ (Dec. 2, 2015), *available at https://www.nasdaq.com/articles/how-survive-markets-without-stop-loss-orders-2015-12-02.*

[657] *See supra* note 609 for dataset description. Stop orders are identified using the reporting requirements for stop orders in the CAT Reporting Technical Specifications for Industry Members. *See CAT Reporting Technical Specifications for Industry Members,* Consolidated Audit Trail, 64 (July 29, 2022), *available at https://www.catnmsplan.com/sites/default/files/2022-07/07.29.2022_CAT_Reporting_Technical_Specifications_for_Industry_Members_v4.0.0r16_CLEAN_0.pdf.*

[658] *See* 2013 FAQs.

[659] *See supra* note 246 for more information about Rule 201 of Regulation SHO.

[660] ''Short exempt'' orders include short sale orders from market makers and short sales priced above the current national best bid at the time of submission. *See* 17 CFR 242.201(c) and (d).

[661] *See supra* section II.B.1.(b) for a discussion of the definition of covered orders.

these orders from executing at the best bid would likely lead to lower execution quality statistics (*e.g.,* negative price improvement and higher effective spreads) as compared to other orders.

However, in the years since Rule 201's adoption, it has become clear that Rule 201 price test restrictions are not often triggered. Staff found that, between April 2015 and March 2022, a Rule 201 trigger event only occurred on 1.7% of trading days for an average stock.[662] Around 18% of Rule 201 triggers occur the day after a previous trigger event, and around 46% occur within a week after a previous trigger event. These statistics imply that Rule 201 triggers tend to be relatively rare, and clustered around a few isolated events.

(4) Orders Submitted Pre-Opening/Post-Closing

When Rule 605 was first adopted, the Commission explained the decision to exclude orders submitted outside of regular trading hours by stating that there are substantial differences in the nature of the market between regular trading hours and after-hours, and therefore orders executed at these times should not be blended together.[663] However, the current exclusion of all orders submitted outside of regular market hours from the definition of ''covered order,'' [664] in addition to excluding orders that execute outside of regular hours, also extends to orders that, while submitted outside of regular market hours, are only eligible to execute during regular market hours. While these orders represent only a small portion of order flow, they represent a relatively high concentration of orders from individual investors. Therefore, the current exclusion of all orders submitted outside of regular trading hours from Rule 605 may lead to the exclusion of an important segment of individual investor orders.

When Rule 605 was first adopted, after-hours markets were still mostly the purview of institutional investors, but a growing number of broker-dealers had recently begun providing their retail customers with the ability to have their orders directed to electronic communication networks (ECNs) after the major markets close for the day. The growth in the availability of after-hours trading for individual investors raised concerns over, and heightened awareness of, the differences in execution quality for after-hours trades, which tend to be much riskier due to lower liquidity levels and higher volatility in after-hours markets.[665]

Along with an increase in access to after-hours trading, the late 1990s and early 2000s saw an increase in the prevalence of online brokerages, in which individual investors in particular were given newfound access to order entry systems. Early research into the rise of online brokerages describes a shift from a system in which retail brokers ''communicate buy/sell recommendations to clients over the telephone'' (presumably during regular working hours), to a system in which individual investors have ''round-the-clock access to trading systems and account information.'' [666] Logically, as investors make use of the ''round-the-clock'' access offered by online brokerages, the number of orders submitted outside of regular market hours has likely increased over the preceding decades. However, not all orders submitted after hours are eligible to trade in after-hours markets, which continues to be the case even in today's market. For example, some broker-dealers' platforms allow customers to submit orders at any time, but unless the customer requests to trade during extended hours and the security is eligible to trade as such, the order will only be executed during regular market hours.[667] Since these orders are not intended to, and in many cases are not eligible to, execute outside of regular trading hours, these orders may not be subject to the same concerns that drove the Commission to exclude orders submitted outside of trading hours from Rule 605 reporting requirements in the Adopting Release.

To estimate the amount of orders that are submitted outside of regular trading hours, data from the Tick Size Pilot B.I Market Quality dataset [668] was analyzed to break order volume down into different trading sessions according to when the order was eligible to trade.[669] The Commission considers only those orders that have an effective time during regular market hours to be eligible for Rule 605 reporting, and excludes orders that are otherwise excluded from current Rule 605 reporting requirements, *i.e.,* because they are an excluded order type or size. The Commission found that a small fraction of orders are effective outside of regular market hours (1.3%), while the vast majority of orders (98.7%) are effective during regular market hours.

At least some of these orders, while submitted outside of regular market hours, execute during regular trading hours, *e.g.,* because they are NMLOs that are only eligible to execute during regular trading hours.[670] In order to estimate the extent to which this occurs, a sample of CAT data [671] was analyzed to examine submission volumes of NMLOs submitted outside of regular trading hours that were designated as only eligible to trade during regular trading hours,[672] and compared them to

[662] This analysis looked at the percentage of trading days that experienced a Rule 201 trigger event for the period January 2012 to February 2021 for all listed stocks on NYSE or NASDAQ exchanges and then averaged across stocks. The Commission restricted its sample to common stocks identified in CRSP (share code 10 or 11), from CRSP 1925 US Stock Database, Ctr. Rsch. Sec. Prices, U. Chi. Booth Sch. Bus. (2022). The Commission also excluded financial stocks (SIC code 6000–6999), as financial stocks may have different properties than other types of stocks, including characteristics related to short selling (*e.g.,* Markus K. Brunnermeier & Martin Oehmke, *Predatory Short Selling,* 18 Rev. Fin. 2153 (2014)). Rule 201 circuit breaker data retrieved from *ftp://ftp.nyxdata.com/NYSEGroupSSRCircuitBreakers/* and *ftp://ftp.nasdaqtrader.com/SymbolDirectory/shorthalts/.*

[663] *See* Adopting Release, 65 FR at 75421.

[664] *See* 17 CFR 242.600(b)(77).

[665] *See, e.g., Special Study: Electronic Communication Networks and After-Hours Trading,* SEC (June 2000), *available at https://www.sec.gov/news/studies/ecnafter.htm.*

[666] Jennifer Wu, Michael Siegel & Joshua Manion, *Online Trading: An Internet Revolution,* Sloan School of Management Massachusetts Institute of Technology Research Notes, p. 4 (1999).

[667] *See, e.g., Extended Hours Overview,* Charles Schwab, *available at https://www.schwab.com/public/schwab/nn/qq/about_extended_hours_trading.html; Extended-Hours Trading,* Robinhood, *available at https://robinhood.com/us/en/support/articles/extendedhours-trading/.*

[668] *See supra* note 619 for dataset description.

[669] These trading sessions include (1) regular hours only; (2) extended hours only; (3) both regular and extended hours with an effective time during regular market hours; and (4) both regular and extended hours with an order effective time during extended hours. *See* Tick Size Pilot Program Appendix B and C Frequently Asked Questions, Q4.11, *available at https://www.finra.org/sites/default/files/Tick-Size-Pilot-Appendix-B-and-C-FAQ.pdf.*

[670] Note that most retail brokers do not permit market orders during extended hours trading. *See, e.g., Extended Hours Overview,* Charles Schwab, *available at https://www.schwab.com/public/schwab/nn/qq/about_extended_hours_trading.html; Extended-Hours Trading,* Robinhood, *available at https://robinhood.com/us/en/support/articles/extendedhours-trading/.*

[671] The sample consists of 390 stocks for the period of March 2021. Note that this sample of NMLOs collected from CAT may include NMLOs that would not be included in Rule 605 reports, if they never touch the NBBO at any point during their lifespan. Characteristics include whether the order was submitted to an exchange or off-exchange market center, distance from the prevailing quote midpoint (or, in the case of pre-open orders, from the open price) in basis points (bps), and order size in terms of number of shares. For off-exchange orders, the Commission is also able to characterize whether the order was initially submitted by an individual investor.

[672] The definition of marketability for the purposes of this analysis for pre-open orders is determined using the NBBO that is first disseminated after the time of order receipt, such that orders to be executed at a market opening price are excluded. *See supra* note 231 and accompanying text for more information about

the volumes and characteristics of NMLOs submitted during a sample 10-minute time window from 9:40 a.m. to 10:40 a.m. This analysis confirms that pre-open orders eligible to trade during regular trading hours likely make up only a very small percentage of order volume, representing only around 4.8% of the volume of orders submitted during a single ten-minute period of the trading day. However, further analysis reveals that these orders contain a high concentration of individual investor orders. Specifically, pre-open share volume contains a much larger fraction of individual investor shares (29.5%) than the sample time window during regular trading hours (1.9%), at least for off-exchange market centers for which individual investor orders could be identified.[673] This is consistent with the idea that at least some of this order flow represents orders that are submitted by individual investors outside of market hours, *i.e.,* via online brokerage accounts, but not necessarily with the intention to engage in after-hours trading.

(c) Information Required by Current Rule 605 Reporting Requirements

In addition to decreasing the coverage of Rule 605, subsequent market changes since the initial adoption of Rule 605 may have also decreased the relevance of some of the metrics included in Rule 605 reports. This section will discuss how market changes may have affected, or will likely affect in the near future, aspects of several such metrics, including the definition of round lots for order size categories, the granularity of metrics related to time-to-execution, and the use of a five-minute time horizon for realized spreads.

(1) Order Size Categories

The Commission believes that defining order size categories in terms of numbers of shares has led these order size categories to be less informative about differences in execution qualities across differently-sized orders. To illustrate, consider that some Regulation NMS rules exclude orders or trades that are sized above $200,000, as these orders typically warrant different treatment than smaller orders.[674] For a $50 stock, a $200,000 order would be equivalent to around 4,000 shares, meaning that typically-sized orders (*i.e.,* orders that are not excluded from the previously described Regulation NMS rules) below $200,000 (and above $500, given that orders below 100 shares are excluded) are split between three order size categories: 100 to 499 shares, from 500 to 1999 shares, and from 2000 to 4999 shares. Market participants are therefore able to use these order size categories to compare across orders of different sizes. However, for a $500 stock, a $200,000 order would only be equivalent to 400 shares. Therefore, for the purposes of Rule 605 reporting, nearly all typically-sized orders in this high-priced stock are either grouped in the smallest order size category (100 to 499 shares[675]), or, if they would fall below the smallest order size category of 100 shares, excluded altogether from reporting requirements.[676] As all orders tend to be clustered into a single category, market participants are unable to use these categories to compare across orders of different sizes in higher-priced stocks. Similarly, at least one market participant argues that the definition of the current order size categories in terms of number of shares together with the exclusion of orders of less than 100 shares,[677] has led to the exclusion of more orders with low dollar values as the average stock price increases.[678]

Furthermore, the Commission's 2020 adoption of the MDI Rules included a new definition of ''round lot'' that causes some round lots to be excluded from reporting requirements, absent an update to Rule 605's order size categories.[679] Specifically, the current size categories as defined under Rule 605, which exclude orders with fewer than 100 shares, exclude a portion of round lots for stocks with prices greater than $250.

(2) Non-Marketable Limit Order Categories

The Commission preliminarily believes that the current categorization of NMLOs may include orders whose executions are more likely to depend on their limit prices and price movements in the market, and exclude orders whose executions are more likely to depend on their handling by the market center. This could lead to the excessive exclusion of limit orders whose execution quality may be relevant to both individual and institutional investors.[680]

When proposing to exclude away-from-the-quote NMLOs with a limit price more than ten cents away from the NBBO, the Commission reasoned that the execution quality statistics for these types of orders may be less meaningful because their executions depend more on the order's limit price and price movement in the market than on handling by the market center.[681] Meanwhile, the current ''near-the-quote'' limit order category[682] is meant to include limit orders that are submitted away from the NBBO, but that still have a relative likelihood of being executed (hence the minimum distance requirement from the NBBO). However, it is important to note that the likelihood of execution of both greatly depends on the movement of the NBBO. An order submitted even within 10 cents of the NBBO may never receive an opportunity to be executed if that order never touches the NBBO (*e.g.,* if prices were to move away from that order immediately after submission), and an order that is submitted further than 10 cents may indeed eventually execute if prices move towards the order.

Figure 7 breaks down a sample of MIDAS NMLO submission data from 80 stocks in March 2022[683] into NMLO

defining the marketability of orders submitted outside of regular market hours.

[673] As the account type (*i.e.,* individual or institutional) data field is only available upon order origination and is not transferred to the executing market center, staff was not able to differentiate individual investors in the CAT data for exchanges.

[674] *See, e.g.,* Rule 606(a)(1) of Regulation NMS (requiring reports on the routing of customer orders) and Rule 600(b)(25) of Regulation NMS (defining ''customer order'' to exclude an order with a market value of $200,000 or more); Rule 604(b)(4) of Regulation NMS (providing an exception for orders of block size from required limit order display) and Rule 600(b)(12) of Regulation NMS (defining ''block size'' as, in part, an order for a quantity of stock having a market value of at least $200,000).

[675] *See* 17 CFR 242.605(a)(1). *See also supra* note 40 and corresponding text for a definition of the current order size categories included in Rule 605 reporting requirements.

[676] In addition, even prior to the implementation of the MDI Rules, a small number of NMS stocks have a round lot size smaller than 100. *See supra* note 266.

[677] *See supra* section VII.C.2.(b)(1)(a) for a discussion of the exclusion of orders that are less than 100 shares from current Rule 605 reporting requirements.

[678] *See* Phil Mackintosh, *Modern Retail Needs Modern Rules,* NASDAQ (May 27, 2021, 11:54 a.m.), *available at https://www.nasdaq.com/articles/modern-retail-needs-modern-rules-2021-05-27/.*

[679] *See supra* note 577 for a definition of these tiers.

[680] Both institutional and individual investors likely make use of NMLOs. One academic study, using data on retail orders between 2003 and 2007 from two OTC market centers, estimated that NMLOs made up around 39% of individual investor order flow. *See* Eric K. Kelley & Paul C. Tetlock, *How Wise are Crowds? Insights from Retail Orders and Stock Returns,* 68 J. Fin. 1229 (2013). Other academic papers suggest that NMLO usage by institutional investors may also be high. *See, e.g.,* Amber Anand, Sugato Chakravarty & Terrence Martell, *Empirical Evidence on the Evolution of Liquidity: Choice of Market Versus Limit Orders by Informed and Uninformed Traders,* 8 J. Fin. Mkt. 288 (2005); Ron Kaniel & Hong Liu, *So what orders do informed traders use?,* 79 J. Bus. 1867 (2006).

[681] *See* Proposing Release, 65 FR 48406 (Aug. 8, 2000) at 48414.

[682] *See* 17 CFR 242.600(b)(14).

[683] *See supra* note 634 for a description of the dataset.

types, including away-from-the-quote, near-the-quote, and at-the-quote NMLOs, along with several categories of inside-the-quote NMLOs depending on their distance from the midpoint (below-the-midpoint, at-the-midpoint, and beyond-the-midpoint).[684] The figure shows that away-from-the-quote NMLOs represent nearly a quarter of all non-marketable share volume.

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Figure 7: Order Submission Share Volume by NMLO Type, March 2022

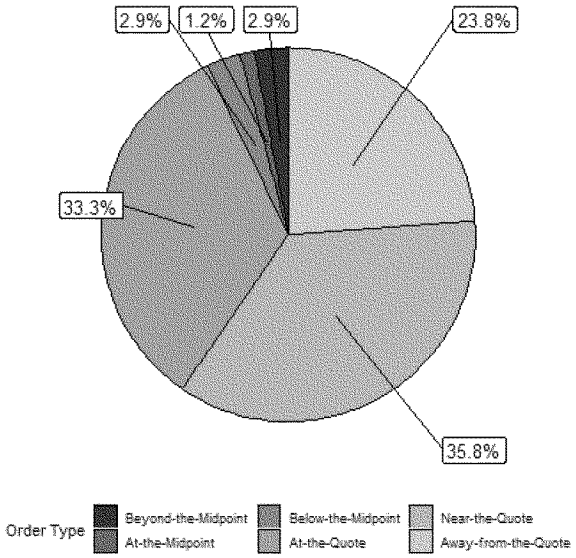

Figure 7: Order Submission Share Volume by NMLO Type, March 2022. This figure plots the percentage of order flow that can be categorized into various NMLO categories, using order submission data from MIDAS. See supra note 634 for a description of the dataset. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 684 and section VII.C.1.d)(2).

Figure 8 presents data on the fill rates of NMLO orders, broken down by NMLO type, using the same sample of MIDAS NMLO submission data.[685] The figure shows that near-the-quote and away-from-the-quote NMLOs appear very similar in terms of fill rates (0.6% and 0.18%, respectively), particularly compared to other types of NMLOs (*e.g.,* inside-the-quote NMLOs have an average fill rate of around 2.7% to 5.1%). The fact that near-the-quote and away-from-the-quote NMLOs have similar fill rates is consistent with the possibility that the current exclusion of NMLOs priced more than 10 cents away from the NBBO is based on a threshold that does not optimally differentiate between orders that have a meaningful chance to execute.[686] Meanwhile, orders that never have a meaningful opportunity to execute (*e.g.,* because they never touch the NBBO) may be included in Rule 605 statistics. To get an idea of the extent to which such orders are currently included in Rule 605 statistics, note that, according to Figure 8, more than 99% of near-the-quote NMLOs do not execute, which, according to Figure 7, represents around 36% of total submission volume. While it is possible that some of these orders did not execute because of their handling by the market center, it is unlikely that this is case for all of them, and likely that some of the lack of fills was the result of other factors, such as price movements or cancellations by the submitter.[687]

Figure 8: Fill Rates of NMLOs, March 2022

[684] Results may be different following the implementation of the MDI Rules. Specifically, the NBBO is anticipated to narrow for stocks priced above $250 as a result of the new definition of round lots, which would likely decrease the number of inside-the-quote NMLOs and increase the number of quotes at or outside of the quotes for these stocks. *See supra* section VII.C.1.(d)(2) for further discussion.

[685] The distribution of orders into various NMLO categories may change following the implementation of the MDI Rules. *See supra* note 684 and section VII.C.1.d)(2). However, it is not clear how a change in the distribution of orders into various NMLO categories would affect the average fill rates of these NMLO categories.

[686] Commenters supported including NMLOs further away from the quote in Rule 605 reports but noted the difficulty of providing meaningful execution quality statistics for such orders. *See supra* notes 296–297 and accompanying text.

[687] *See infra* section VII.E.2.(b) for a discussion of how NMLO orders that are cancelled quickly after submission may impact fill rates.

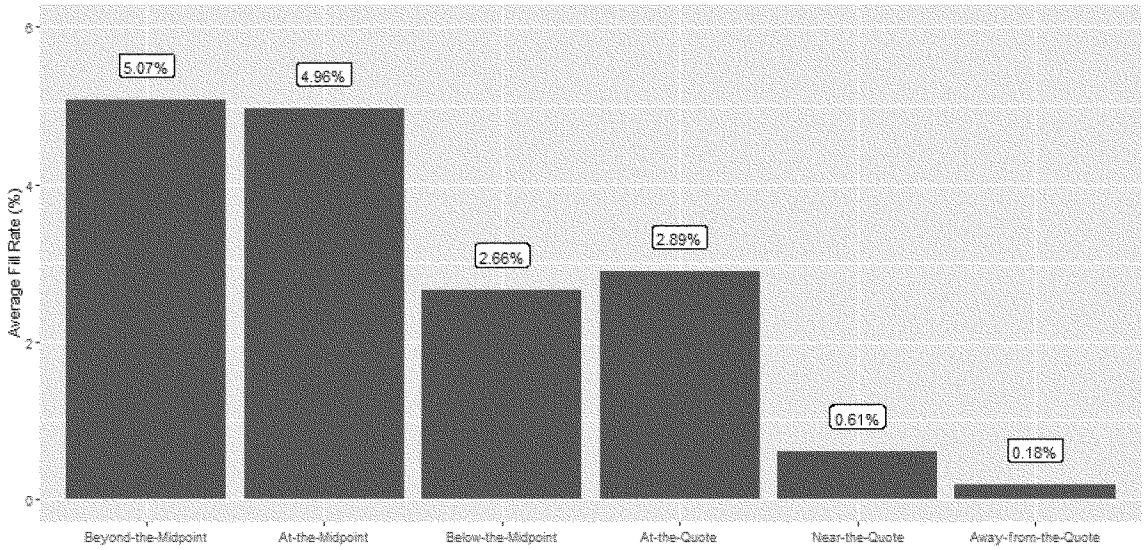

Figure 8: Fill Rates of NMLOs, March 2022. This figure plots the fill rates of order flow that can be categorized into various NMLO categories, using order submission data from MIDAS. Fill rates are calculated as the number of shares executed divided by the number of shares submitted. See supra note 634 for a description of the dataset. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 685 and section VII.C.1.d)(2).

Furthermore, defining the threshold for inclusion in Rule 605 reporting requirements in nominal terms (*i.e.,* 10 cents) means that NMLO coverage varies depending on the stock price: high-price stocks with smaller relative tick sizes have less NMLO coverage, since 10 cents represents a relatively tighter band around the NBBO.[688] This is shown in Figure 9, which breaks down the NMLO submission volumes in Figure 8 by both order type and average share prices. The figure shows that away-from-the-quote NMLOs represent 24.4% of total NMLO share volumes for the group of stocks with the highest share prices, but only 8.4% for the group of stocks with the lowest share prices. Excluding large portions of relevant NMLOs results in less reliable market quality measures; this may especially be the case for high-priced stocks, thus making comparisons between market centers less reliable for these stocks.

Figure 9: Order Submission Share Volume by NMLO Type and Stock Price Quartiles, March 2022

[688] Results may be different following the implementation of the MDI Rules. Specifically, NMLO coverage for stocks priced above $250 may decrease even further, as the narrowing of the NBBO for these stocks would result in even tighter price bands. *See supra* section VII.C.1.(d)(2) for further discussion.

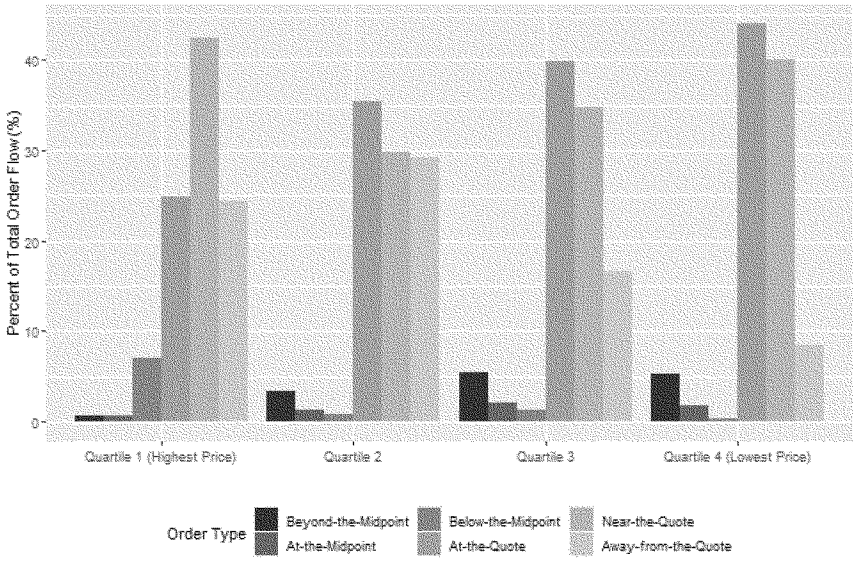

Figure 9: Order Submission Share Volume by NMLO Type and Stock Price Quartiles, March 2022. This figure plots the percent of order flow that can be categorized into various NMLO categories, using order submission data from MIDAS. Stocks are split into quartiles based on average stock prices. See supra note 634 for a description of the dataset. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 688 and section VII.C.1.d)(2).

(3) Beyond-the-Midpoint Limit Orders

Currently, Rule 605 reports may not accurately reflect how the execution quality of inside-the-quote NMLOs may vary across market centers. The Commission preliminarily understands that some inside-the-quote limit orders may have different execution quality characteristics than other types of NMLOs, and that this may vary across market centers. In particular, the Commission preliminarily understands that some market centers, such as some wholesalers, treat ''beyond-the-midpoint'' limit orders (*i.e.,* NMLOs that are priced more aggressively than the midpoint) like marketable limit orders and will offer price improvement to these orders. However, because they are not a marketable order type (*i.e.,* they do not fully cross the spread), some statistics are not currently calculated for inside-the-quote limit orders, including price improvement statistics and effective spreads.

In order to examine this possibility, Table 5 presents results from an analysis of the execution quality of beyond-the-midpoint NMLOs compared to other order types, including market, marketable limit, and other types of inside-the-quote NMLOs, using a sample of orders executed by the six most active wholesalers from CAT data for the period of Q1 2022.[689] The results show that beyond-the-midpoint NMLOs executed by wholesalers tend to have much faster time-executions and higher fill rates than other types of inside-the-quote NMLOs, and are also somewhat more likely to be given price improvement. Grouping beyond-the-midpoint orders together with other NMLOs obscures the differences in these market centers' treatment of these types of orders, including potential differences in price improvement.

TABLE 5—EXECUTION QUALITY CHARACTERISTICS OF BEYOND-THE-MIDPOINT NMLOS EXECUTED BY WHOLESALERS, Q1 2022

Order type	Average time-to-execution (seconds)	Median time-to-execution (seconds)	Fill rates (%)	Price-improved orders (% total orders)
Market	21.19	0.04	91.0	78.1
Marketable Limit	233.95	3.22	94.0	55.9
Beyond-the-Midpoint NMLOs	1503.31	145.49	94.1	4.6

[689] *See supra* note 609 for dataset description. This dataset is from prior to the implementation of the MDI Rules and the distribution of orders into various NMLO categories, including beyond-the-midpoint orders, may change following the implementation of the MDI Rules. *See supra* note 684 and section VII.C.1.(d)(2). However, it is not clear how a change in the distribution of orders into various NMLO categories would affect the average fill rates and time-to-execution of these NMLO categories. The percent of price-improved orders may also change, depending on how wholesalers adjust their price improvement practices in stocks with narrower spreads. However, it is unclear how the percentage of price-improved beyond-the-midpoint NMLOs would change relative to other types of NMLOs.

TABLE 5—EXECUTION QUALITY CHARACTERISTICS OF BEYOND-THE-MIDPOINT NMLOS EXECUTED BY WHOLESALERS, Q1 2022—Continued

Order type	Average time-to-execution (seconds)	Median time-to-execution (seconds)	Fill rates (%)	Price-improved orders (% total orders)
At-the-Midpoint and Below-the-Midpoint NMLOs	4189.13	1480.60	81.7	1.1

Table 5: Execution Quality Characteristics of Beyond-the-Midpoint NMLOs Executed by Wholesalers, Q1 2022. This table shows execution quality metrics for different order types handled by the top six wholesalers using CAT data during the period of Q1 2022. *See supra* note 609 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. *See supra* note 689 and section VII.C.1.d)(2).

(4) Time-to-Execution

The rapid increase in execution speeds in modern markets has decreased the usefulness of time-to-execution information that is currently required in Rule 605 reports.[690] Currently, time-to-execution information is required in Rule 605 reports in two ways: first, for market and marketable limit orders, the share-weighted average time-to-executions for orders executed with price improvement, at the quote, and with price dis-improvement, calculated based on timestamps recorded in seconds; and second, for all orders, the number of shares executed within certain pre-defined time-to-executions categories.[691]

First, calculating average time-to-execution statistics using timestamps recorded in terms of seconds does not reflect changes in market speeds. Figure 10 uses data from the SEC's MIDAS analytics tool [692] to plot the percentage of on-exchange NMLOs that, conditional on being executed,[693] are fully executed within one second or less from the time of submission between Q4 2012 and Q1 2022. The figure shows that this percentage has increased over time across different market capitalization groups, and that in Q1 2022 more than half (51.6%) of executed NMLOs are executed in less than one second in large market cap stocks. Therefore, while timestamps expressed in seconds may have been appropriate for the markets when Rule 605 was first adopted, they are likely to miss much of the variation in time-to-execution across market centers in today's markets.

Figure 10: Percentage of NMLOs Executed Within One Second, Q1 2012–Q4 2022

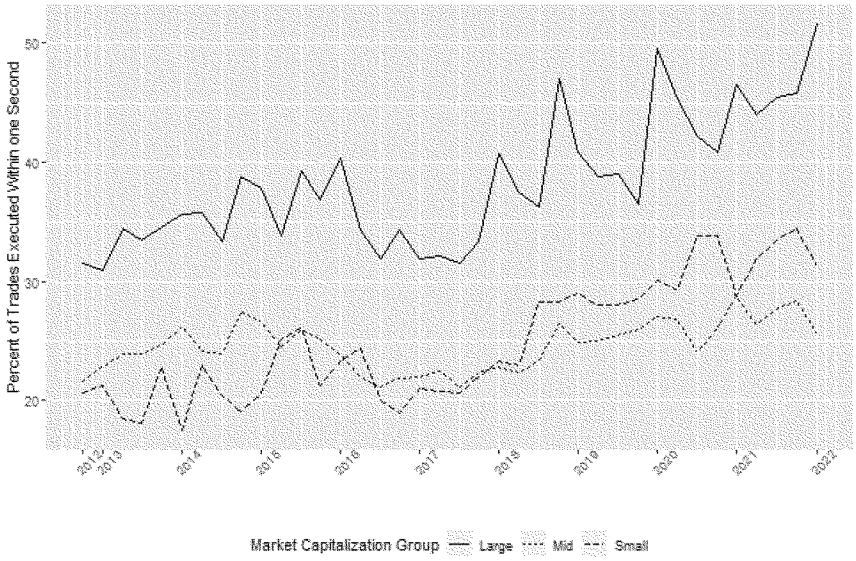

Figure 10: Percentage of NMLOs Executed Within One Second, Q1 2012 - Q4 2022. This figure plots the percentage of NMLOS that, conditional on being executed on a national securities exchange, are executed within one second or less from the time of submission between Q4 2012 and Q1 2022 using data from the SEC's MIDAS analytics tool. See supra note 692 for dataset description.

[690] *See supra* note 133 and accompanying text discussing concerns raised by commenters about the current provisions in Rule 605 for time-to-execution information.

[691] *See supra* note 343 for a definition of these time-to-execution categories.

[692] *See* dataset *Conditional Cancel and Trade Distributions,* SEC, *available at https://www.sec.gov/marketstructure/downloads.html.* If the order is not fully executed, it is treated as canceled at the close. *See Quote Life Report Methodology,* SEC, *available at https://www.sec.gov/marketstructure/quote-life-report-methodology.*

[693] *I.e.,* Figure 10 plots the number of fully executed NMLOs executed within one second relative to the total number of fully executed on-exchange NMLOs. Note that, in contrast, Figure 8 plots the number of executed NMLO shares divided by the total number of submitted NMLO shares.

Second, given that many orders are executed on a sub-second basis, the current time-to-execution buckets prescribed by Rule 605 are not able to fully capture variations in time-to-executions across order types.[694] To illustrate this, Figure 11 groups on-exchange NMLO executions collected from MIDAS for the period of March 2022 [695] into time-to-execution buckets that correspond to those currently defined in Rule 605. The figure shows that, while the distribution of orders looks reasonable for away-from-the-quote and near-the-quote NMLOs, for which executions are relatively evenly distributed across the time-to-execution categories, these categories do not capture much differentiation for other NMLO types, particularly for those that take place inside the quote. For inside-the-quote NMLOs, 84.2% to 85.7% of orders are grouped in the shortest time-to-execution bucket (from 0 to less than 10 seconds), depending on the distance to the midpoint, while the category corresponding to the longest time-to-execution bucket defined by Rule 605 (5 to 30 minutes) has only 1.1% to 1.3% of executions. Therefore, these time-to-execution categories likely do not fully capture variations in the execution times of these orders across reporting entities.

Figure 11: Distribution of NMLO Execution Times, March 2022

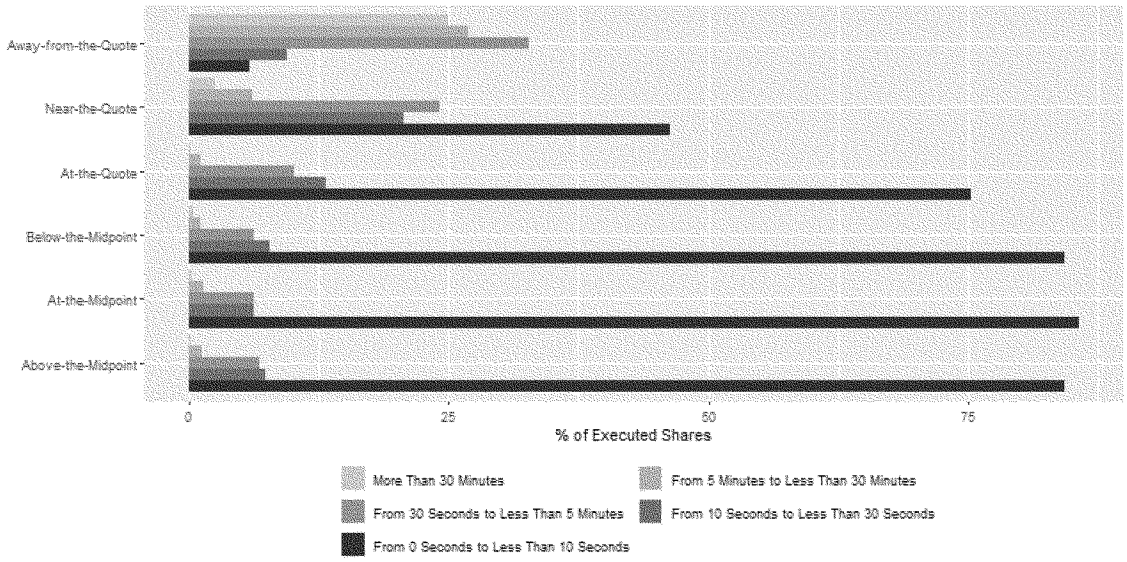

Figure 11: Distribution of NMLO Execution Times, March 2022. This figure plots the distribution of shares across different time-to-execution categories, for different categories of NMLOs, using order submission data from MIDAS. See supra note 634 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 695 and section VII.C.1.d)(2).

MIDAS data includes only orders and quotes that are posted on national securities exchanges' LOBs and trades that are executed against those orders,[696] and as such it is not possible to view the submission times (and thus calculate the time-to-execution of) market and marketable limit orders using MIDAS data. As a result, the above analysis is only able to consider the time-to-execution of on-exchange NMLOs. In order to estimate the time-to-execution of both on- and off-exchange orders, including market and marketable limit orders, the Commission used the Tick Size Pilot B.I Market Quality data from April 2016 until March 2019.[697]

[694] *See supra* note 343 for a definition of these time-to-execution categories.

[695] *See supra* note 634 for data description. Note that this dataset includes only NMLOs submitted to exchanges that do not immediately execute and are subsequently posted to the limit order book. The results of this analysis may not reflect the execution quality of inside-the-quote NMLOs that execute immediately, *e.g.,* against hidden liquidity on the limit order book. Furthermore, this dataset is from prior to the implementation of the MDI Rules and the distribution of orders into various NMLO categories may change following the implementation of the MDI Rules. *See supra* note 684 and section VII.C.1.(d)(2). However, it is not clear how a change in the distribution of orders into various NMLO categories would affect the average time-to-execution of these NMLO categories.

[696] *See supra* note 634. MIDAS data includes information about off-exchange trade executions, but not information about any off-exchange order submissions, so it is also not possible to use MIDAS data to calculate the time-to-execution of off-exchange orders.

[697] *See supra* note 619 for data description. Note that, as the Tick Size Pilot only collected data for small cap stocks, these execution times are not necessarily representative of all stocks. For example, larger market cap stocks are typically more liquid and likely execute faster. Also, as this is an older data set (April 2016 until March 2019), it may be that market speeds have changed since this time. However, as it is likely that market speeds have only gotten faster since this time period, it could represent a lower bound on execution times and therefore still give an idea of how relevant the current Rule 605 time-to-execution buckets are for market and marketable limit orders. Lastly, this dataset also includes off-exchange orders, while the MIDAS data only includes on-exchange orders, which could result in different execution times between the two datasets. Furthermore, this dataset is from prior to the implementation of the MDI Rules and the distribution of orders into various NMLO categories may change following the implementation of the MDI Rules. *See supra* note 684 and section VII.C.1.(d)(2). However, it is not clear how a change in the distribution of orders into various NMLO categories would affect the average time-to-execution of these NMLO categories.

Figure 12 shows the distribution of time-to-execution statistics for market and marketable limit orders, along with the three categories of non-marketable limit orders currently required in Rule 605 reports (*i.e.,* inside-the-quote, at-the-quote, and near-the-quote). Note that the time-to-execution categories defined in the Tick Size Pilot dataset are more granular than those in Rule 605.

Figure 12: Distribution of Order Execution Times, April 2016–March 2019

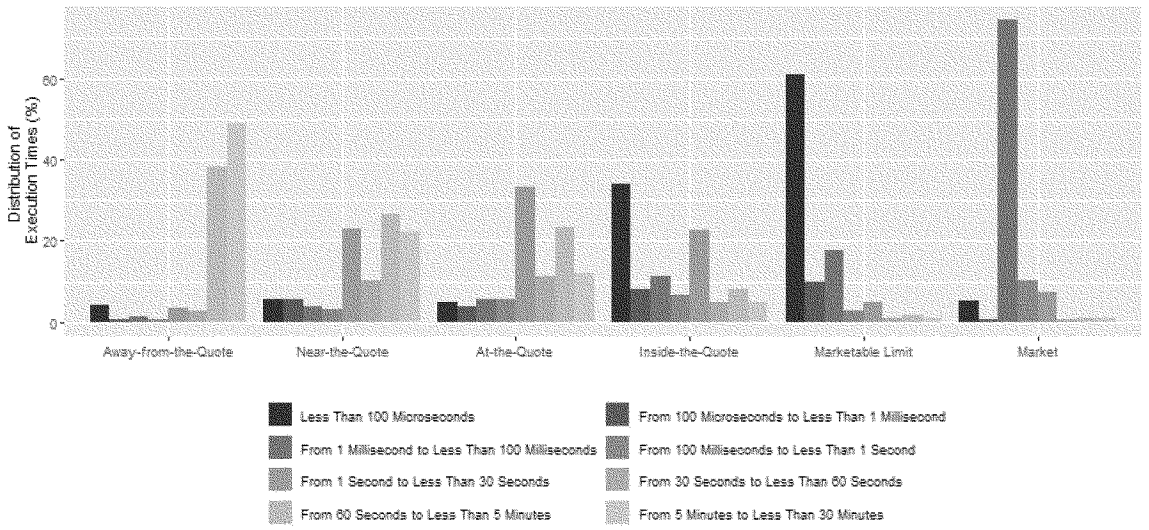

Figure 12: Distribution of Order Execution Times, April 2016 – March 2019. This figure plots the distribution of execution times across different time-to-execution categories, for market orders, marketable limit orders, and different categories of NMLOs. See supra note 619 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 697 and section VII.C.1.d)(2).

Echoing the results using MIDAS data in Figure 11, Figure 12 shows that, for at-the-quote and near-the-quote limit orders, executions are reasonably well distributed across the different time-to-execution buckets and there is positive volume in the longer time-to-execution buckets that are included in both the Rule 605 and Tick Size Pilot categorizations (30 to 59 seconds, 60 to 299 seconds, and 5 to 30 minutes). However, similar to the results for inside-the-quote NMLOs, for market and marketable limit orders, execution times are mostly bunched up at the faster end of their time buckets; in fact, the vast majority of these orders are executed in under one second, falling within the shortest Rule 605 category of shares executed from 0 to 9 seconds. Likewise, the longer time-to-execution buckets that are included in both the Rule 605 and Tick Size Pilot categorizations are virtually empty. Therefore, as with inside-the-quote NMLOs, current Rule 605 time-to-execution categories are missing information about potential differences across reporting entities in terms of the execution times of the market and marketable limit orders that they handle, which limits the usefulness of time-to-execution information for investors.[698]

(5) Effective and Realized Spreads

The Commission believes that current requirements in Rule 605 related to measures of effective and realized spreads may lead to uninformative or incomplete information.

First, because of the increase in the speed at which markets operate,[699] the requirement to use a five-minute benchmark to calculate realized spreads[700] may limit the ability of the Rule 605 realized spreads to measure what they are intended to measure, *i.e.,* the adverse selection risk associated with providing liquidity at a market center. Liquidity providers face adverse selection risk when they accumulate inventory, for example by providing liquidity to more informed traders, because of the risk of market prices moving away from market makers before they are able to unwind their positions.[701] Realized spreads are calculated by comparing an order's transaction price to the NBBO midpoint five minutes later (*i.e.,* an estimate of the average expected trade price). Smaller (or even negative) realized spreads reflect that market prices have moved away from market makers, which is usually a reflection of order flow with

[698] Academic literature suggests that time-to-execution information would be especially useful for institutional investors with short-lived private information, who profit from trading against other, slower institutions. *See, e.g.,* Ohad Kadan, Roni Michaely & Pamela C. Moulton, *Trading in the Presence of Short-Lived Private Information: Evidence from Analyst Recommendation Changes,* 53 J. Fin. Quantitative Analysis 1509 (2018). Time-to-execution information would also benefit institutions that engage in market making, as one study shows these institutions are likely to rely on speed to reduce their exposure to adverse selection and to relax their inventory constraints. *See* Jonathan Brogaard, Bjorn Hagströmer, Lars Nordén & Ryan Riordan, *Trading Fast and Slow: Colocation and Liquidity,* 28 Rev. Fin. Stud. 3407 (2015).

[699] *See supra* section VII.C.2.(c)(4) for a discussion of evidence of increased market trading speeds.

[700] *See* 17 CFR 242.600(b)(9). *See also supra* note 359 and accompanying text for a further discussion of the definition of the realized spread.

[701] For example, if a liquidity provider provides liquidity to an informed trader, who is selling its shares because it knows that the share price is about to drop, the market maker will accumulate a long position in the stock. If the market maker were to immediately try to unwind this position in the market, the share price may have already dropped and the market maker will have to sell at a lower price than what it paid for the shares.

greater adverse selection risk. Therefore, all else being equal, if a market center reports favorable execution quality measures but a low or negative realized spread, this would reflect that the market center is still providing liquidity even during adverse market conditions.

Selecting an appropriate time horizon to calculate the realized spread must strike a balance between too short, which could distort the measures by transitory price impact, and too long, which could measure noise [702] or the cumulative impact of subsequent market changes which are unrelated to the order's execution quality. An ideal measurement horizon would be one that aligns with the amount of time an average liquidity provider holds onto the inventory positions established from providing liquidity, which is not easily observable. A number of academic studies argue that the five-minute horizon is too long for a high-frequency environment.[703] As one paper puts it, ''five minutes is a 'lifetime', and so is not a meaningful time frame in which to evaluate trading.'' [704] Another paper shows that realized spreads will generally increase as the time horizon that they are calculated over is shortened, highlighting that realized spreads are highly dependent on the time horizon over which they are calculated.[705]

In order to see how using different time horizons for calculations of realized spreads can affect comparisons across market centers, using TAQ data for a sample of 400 stocks in February 2021,[706] the Commission calculated the average realized spreads across 15 different market centers, measured using six different time horizons: 1 second, 5 seconds, 10 seconds, 15 seconds, 1 minute, and 5 minutes. The results are presented in Figure 13, and support the findings from the empirical literature, that the choice of time horizon is non-trivial and realized spreads are generally increasing as the time horizon decreases.[707]

Figure 13: Average Realized Spreads by Market Center and Time Horizon, February 2021

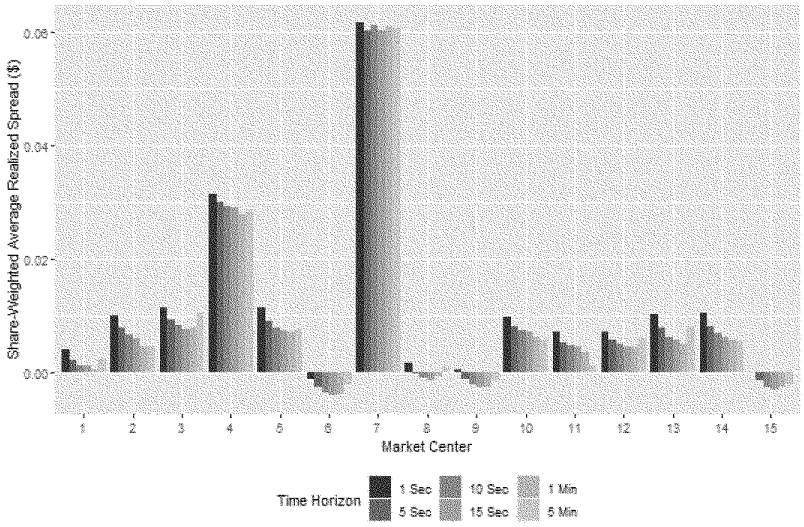

Figure 13: Average Realized Spreads by Market Center and Time Horizon, February 2021. This figure plots the share-weighted average realized spread using different time horizons, across 15 different national securities exchanges, using data from TAQ. See supra note 706 for dataset description. Measures grouped by exchange were calculated on a stock-day basis, then weighted according to the formula: Measures of Stock *i* on Market Center *j* × (Volume of Stock *i* across All Market Centers / Volume of All Stocks across All Market Centers). To account for the fact some stocks did not trade on some market centers on some days, in those instances, the stock-day-exchange measure was replaced by the corresponding measure across all market centers. The measures were then summed up by stock and averaged across trading days. This weighting avoids cases in which a market center may have a higher dollar realized spread because it had more trading volume in high-priced stocks, which tend to have higher realized spreads by construct. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 707 and section VII.C.1.d)(2).

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[702] The term ''noise'' is used throughout in the statistical sense and refers to unexplained or unrelated variability in observations that degrades the efficiency of computed statistics or estimators.

[703] *See, e.g.,* O'Hara 2015; O'Hara et al.; Conrad and Wahal.

[704] *See* O'Hara 2015. The author argues that the use of a five-minute time horizon to calculate realized spreads leads to spreads that are nearly always negative, which is inconsistent with their interpretation as returns to market-making. The implication is that the five-minute time horizon is too noisy.

[705] *See* Conrad and Wahal.

[706] Using CRSP data from the last trading day in February 2021, the Commission selected 400 stocks, 100 each from 4 size quartiles: under $100 million, $100 million to $1 billion, $1 billion to $10 billion, and over $10 billion. Within each market cap group, the Commission split the stocks into 4 quartiles based on price and selected 25 stocks from each price quartile evenly spaced within the quartile. The Commission manually replaced 3 stocks in the smallest size quartile with a price and sized matched stock because they had very little trading volume. The Commission limited its analysis to trades during regular market hours without an irregular sale condition. Analysis derived based on data from CRSP 1925 US Stock Database, Ctr. Rsch. Sec. Prices, U. Chi. Booth Sch. Bus. (2022).

[707] This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. Specifically, the NBBO midpoint in stocks priced higher than $250 could be different under the MDI Rules than it otherwise would be, resulting in changes in the estimates for statistics calculated using the NBBO midpoint, such as realized spreads. While specific numbers might change, the Commission does not expect the relative variation in realized spreads across different time horizons to change as a result of the implementation of MDI. *See supra* section VII.C.1.(d)(2) for further discussion.

These differences can have implications for comparisons across market centers as well. As shown in Figure 13, while Market Centers 8 and 9 have positive realized spreads using the shortest time horizon, their spreads are mostly negative at longer time horizons. As a result, an assessment of whether these market centers have higher or lower realized spreads (*i.e.,* more or less adverse liquidity conditions) as compared to, say, Market Center 6, depends on the time horizon used. Therefore, the choice of interval can not only affect the interpretation of realized spreads as a measure of liquidity conditions, but also affect comparisons across market centers.

From the results of this analysis, it is unclear whether the choice of any specific measurement horizon results in realized spreads more accurately measuring adverse selection risk, as the ''ideal'' measurement horizon is not easily observable. However, given the higher frequency of trading today, it is likely that the use of a five-minute horizon for realized spreads limits the extent to which these measures are able to capture adverse selection risk, making it more difficult to compare conditions for liquidity providers across market centers.

Second, reporting entities are currently not required to include information about the effective spreads of NMLOs in Rule 605 reports, which means that neither individual nor institutional investors have access to information about this dimension of execution quality for their NMLOs. The effective spread is calculated by comparing the trade execution price to the midpoint of the prevailing NBBO at the time of order receipt, which is used as an estimate of the stock's value.[708] For market and marketable limit orders, the effective spread captures how much more than the stock's estimated value a trader has to pay for the immediate execution of its order. For NMLOs, instead of capturing a cost of immediacy, the effective spread captures how much the limit order provider expects to earn (*i.e.,* pay less than or receive more than the stock's estimated value, depending on whether its order is to buy or sell) from the execution of its limit order.[709] This measure of the expected benefits to liquidity provision contains information that may otherwise be useful to investors, but is currently missing in Rule 605 reports.[710]

Lastly, the fact that Rule 605 reports only contain information on average realized and average effective spreads in terms of dollar amounts makes it difficult for market participants to account for differences in share prices when comparing across market centers.[711] While spreads in dollar terms can be useful for participants because they can reflect a cost of (or benefit to) trading in terms that are easy to interpret, it is also the case that, since the effective spread is a per-share cost, the real costs to investors captured by the effective spread can be very different, depending on the stock price.[712] All else being equal, spread measures tend to be higher in dollar terms for higher-priced stocks. As different reporting entities handle and/or transact in different mixes of stocks, this may make it difficult for market participants who may want to compare reporting entities' overall price performance or their performance for baskets of stocks to aggregate across effective spreads.[713]

Also, measuring spreads in absolute terms may lead to comparisons across reporting entities that do not take into account potential differences in the timing of order flow, particularly for stocks whose prices vary significantly over the course of the monthly reporting period. For example, say that a stock's price increased dramatically over the course of a month from $2.50 to $250 and that, by chance, Market Center A executed more order flow for that stock at the beginning of the month, while Market Center B executed more order flow for that stock at the end of the month. In its Rule 605 report for that month, Market Center A showed an average effective spread of $0.01, while Market Center B showed an average effective spread of $0.10. Measured in dollar terms, Market Center B would seem to have offered worse execution prices than Market Center A, since it is associated with higher effective spreads. However, relative to the stock price, Market Center B would actually have the offered the better prices (a percentage effective spread of 0.04%) compared to Market Center A (a percentage effective spread of 0.4%).[714] This illustrates that a market center's spread measures may be higher in dollar terms, but not necessarily because it offered worse execution performance; instead, these differences in spread measures may simply reflect changes in the stock's dollar price and the timing of market center's order flow.

(6) Price and Size Improvement

The current measure of price improvement required for Rule 605 reports may not succeed in always capturing price improvement relative to the best available prices. Currently, market centers are required to report price improvement as the difference between the trade price and the NBBO.

[708] *See, e.g.,* Bjorn Hagströmer, *Bias in the Effective Bid-Ask Spread,* 142 J. Fin. Econ. 314 (2021). *See infra* section VII.E.3.(c)(3) discussing potential issues with using the midpoint to calculate effective spreads.

[709] The interpretation of effective spreads for NMLOs is different from that of realized spreads. Effective spreads capture what liquidity providers expect to earn from providing liquidity, assuming that prices do not change before the liquidity provider is able to unwind its position and realized its profit. Meanwhile, realized spreads capture what it actually earns, taking into account that the market price may have moved against the liquidity provider before it could unwind its position. *See supra* note 701 and accompanying text. Therefore, while the effective spread measures the expected benefits to liquidity provision, the realized spreads measure its riskiness.

[710] Both individual and institutional investors provide liquidity through the use of NMLOs. *See supra* note 680.

[711] In theory, market participants could also control for differences in share prices by matching up stock-level information from Rule 605 reports to, *e.g.,* information on the stock's average stock price from that month. However, this would require market participants who wish to control for differently-priced stocks to go through the extra step of gathering and matching stock price information to Rule 605 data, which may be an unreasonable expectation, particularly for individual investors with limited resources. Furthermore, while a monthly average might well capture the prevailing stock price for any given execution for a stock with low price volatility, it might not be a good representation of the prevailing stock price for executions in stocks with high price volatility.

[712] To illustrate, consider an investor that wants to acquire a $10,000 position in a $250 stock with an effective spread of $0.01; the investors will have to pay about $0.40 to purchase 40 shares of the stock. Now consider an investors who wants to acquire a $10,000 position in a $2.50 stock with an effective spread of $0.01; the investor would have to pay around $4.00 to acquire 400 shares. In other words, even though the dollar effective spread was the same, it was ten times more expensive for the investor to accumulate a position worth the same dollar amount in the lower-priced stock.

[713] While the main purpose of Rule 605 is to facilitate comparisons across reporting entities on the basis of execution quality within a particular security, the Commission understands that access to aggregated information is useful for market participants. The proposed amendment to require reporting entities to prepare summary reports that aggregate execution quality information for S&P 500 stocks, along with all NMS stocks, would give market participants access to aggregate effective spreads for one commonly used basket of stocks. Meanwhile, per-stock percentage spread information would enhance market participants' ability to aggregate effective spread information across baskets of stocks other than the S&P 500.

[714] To illustrate how the percentage effective spread can reflect different costs in real terms, consider if one customer acquired a $10,000 stake in the stock at the beginning of the month (*i.e.,* $10,000/$2.50 = 4,000 shares); a per-share effective spread of $0.01 means that the customer's cost of acquiring the position would have been $40. Meanwhile, another customer acquired a $10,000 stake at the end of the month (*i.e.,* $10,000/$250 = 40 shares); a per-share effective spread of $0.10 means that the customer's cost would have been only $4.

However, a recent academic working paper shows that odd-lots offer better prices than the NBBO 18% of the time for bids and 16% of the time for offers.[715] If an order executes against a resting odd-lot with a price better than the NBBO, the execution would result in positive price improvement according to the current Rule 605 reporting requirements. In cases where this occurs, this positive price improvement is the result of an inadequate benchmark price being used, and not the same as if the market center were to actively offer the order at a price better than the best available market price, which is what price improvement is typically intended to measure.

Furthermore, such positive price improvement may actually reflect price dis-improvement, once all available displayed liquidity is taken into account. For example, if a market center internalizes an order with $0.05 of price improvement relative to the NBBO, but odd-lots are available on another market center at prices that are $0.10 better than the NBBO, the market center would post a price improvement measure of $0.05, even though the investor could have received a better price if the market center had routed the order to execute against the available odd-lot liquidity instead of internalizing the order. As a result, current measures of Rule 605 may overstate the amount of price improvement offered by some market centers.

Information about price improvement is different from information about whether orders received an execution of more than the displayed size at the quote, *i.e.,* ''size improvement.'' The price improvement metrics currently required by Rule 605 do not necessarily capture a market center's ability to fill orders beyond the liquidity available at the NBBO.[716] For example, consider a situation in which the market is $10.05 × $10.10 with 100 consolidated shares available at the NBO of $10.10 and 100 consolidated shares available at the next best ask price of $10.15. Say that a trader submits a marketable buy order for 200 shares to a market center, which fills the entire order at the best ask price of $10.10. The market center's Rule 605 statistics would reveal a price improvement metric of $0 for this order, despite the fact that the trader saved money by avoiding having to walk the book, which would have resulted in a total price of (100 * $10.10) + (100 * $10.15) = $2,025. As a result of the market center's ability to offer this ''size improvement,'' the trader saved an average of $10.125 $− $10.10 = $0.025 per share. This information about execution quality is not reflected in the market center's price improvement statistics.

As the Commission stated in the Adopting Release, the average effective spread captures some information about size improvement.[717] The effective spread is calculated by comparing the trade execution price with the midpoint of the NBBO, rather than with the NBBO itself. In this way, it captures the full range of available liquidity at a market center and not merely the displayed orders that determine the NBBO. The effective spread will be larger for orders that are larger than liquidity available at the NBBO and are required to walk the book. Therefore, generally speaking, a market center that offers greater size improvement will tend to have a lower average effective spread (*i.e.,* these measures will be negatively correlated).[718] However, as this measure contains information about both size and price, it may be difficult to disentangle information about size improvement from information about price improvement when interpreting average effective spreads.[719] Therefore, investors that particularly value the ability of market centers to offer size improvement, such as investors trading in larger order sizes, would not currently be able to use the metrics currently contained in Rule 605 reports to easily discern which market center would better handle their order according to this dimension of execution quality.[720]

(7) Marketable IOCs

The Commission preliminarily believes that grouping marketable IOCs together with other marketable limit orders may lead to a downward skew on the execution quality metrics (specifically, derived estimates of fill rates) for market centers that handle a large amount of IOCs, which would hinder the extent to which these metrics could be used to accurately compare execution quality across market centers. At least one commenter to the 2010 Concept Release on Equity Market Structure pointed out that IOCs may have a different submitter profile (typically, institutional investors) and different execution quality characteristics than other types of orders.[721] Furthermore, an analysis using CAT data[722] of retail orders received at larger retail brokers during June 2021 indicate that approximately only 0.02% of individual investor

[715] *See* Bartlett et al. (2022). The authors found that this percentage increases monotonically in the stock price, for example, for bid prices, increasing from 5% for the group of lowest-price stocks in their sample, to 42% for the group of highest-priced stocks.

[716] An analysis of data from the Tick Size Pilot B.II Market and Marketable Limit Order dataset reveals that nearly 7% of orders had sizes greater than the liquidity available at the NBBO between April 2016 and March 2019. *See infra* note 723 for data description. *See also supra* note 406 and accompanying text. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. Specifically, the MDI Rules could result in a smaller number of shares at the NBBO for stocks in higher-priced round lot tiers, increasing the number of orders with sizes greater than the NBBO. *See supra* section VII.C.1.(d)(2) for further discussion.

[717] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75425.

[718] For example, assume that a trader submits a marketable buy order for 100 shares to a $10.05 × $10.10 market with 100 consolidated shares available at the NBO of $10.10 and 100 consolidated shares available at the next best ask price of $10.15. In this case, the effective spread would be 2 * ($10.10 − $10.075) = $0.05, reflecting that the trader had to pay an average of $0.05 more per share than the NBBO midpoint. Now consider the situation in which the trader instead submits a marketable buy order for 200 shares to a market center (''Market Center A'') that walks the order up the book. In this case the effective spread will be twice as high, 2 * ($10.125 − $10.075) = $0.10. This higher effective spread reflects the need for Market Center A to use volume beyond the best quote to fill the order. If, on the other hand, instead of walking the 200-share order up the book, a market center (''Market Center B'') fills the entire buy order at the current NBO of $10.10; the effective spread would only be $0.05. The ability of Market Center B to execute an order for more than the displayed size at the quote is therefore reflected in an effective spread that is lower than that of Market Center A.

[719] To illustrate, consider the example in *supra* note 718, but, instead of 200 shares, the trader's order was for 100 shares and Market Center A executed the order with an average price dis-improvement of $0.025; the effective spread for Market Center A would similarly be $0.10. Furthermore, consider a situation in which the market is wider at $10.12 × $10.02 and Market Center B executes the 100-share order with an average price improvement of $0.025 per share, while Market Center A executes it without any price improvement. Both of these cases would lead to the same effective spreads (an effective spread of $0.10 for Market Center A, and an effective spread of $0.05 for Market Center B) as the above-described scenario in which Market Center B offered size improvement and Market Center A did not, but for situations in which the order size is less than or equal to the displayed size at the quote.

[720] For example, compare the example of Market Center B offering size improvement to a 200-share order in note 718, *supra,* to the example of Market Center B offering price improvement to a 100-share order in note 719, *supra.* A trader that tends to submit 200-share orders would want to know a market center's ability to offer the first scenario, while a trader that tends to submit 100-share orders would want to know the market center's ability to offer the second scenario. However, in both examples the Rule 605 report would show an effective spread statistic of $0.05 for orders in the order size category of 100–499 shares, which means that these traders would not be able to use this statistic to discern a market center's execution quality according to the dimension of execution quality that they find most valuable.

[721] *See supra* note 326 and accompanying text.

[722] *See supra* note 609 for dataset description.

orders are submitted with an IOC instruction.

To examine whether IOC orders have different execution quality characteristics than other types of orders, an analysis was performed using data from the Tick Size Pilot B.II Market and Marketable Limit Order dataset,[723] which includes a flag indicating whether a market or marketable limit order has been marked as IOC. The results are presented in Table 6 and show that IOCs indeed may have different execution quality, as they typically have much lower fill rates (3.22%) than other market and marketable limit orders (15.94%), particularly for larger-sized orders. Therefore, the inclusion of IOCs along with other types of market and marketable limit orders may skew the execution quality of these other orders types, particularly since IOCs make up more than 90% of market and marketable share volume.

TABLE 6—IMMEDIATE-OR-CANCEL (IOC) SHARE VOLUME, OCTOBER 2018–OCTOBER 2019

	IOC volume (% of share volume)	Fill rate (IOC)	Fill rate (non-IOC)
Market Centers Other than Wholesalers:			
Less than 100 shares	88.1	39.6	15.4
100 to 499 shares	88.9	14.8	11.5
500 to 1,999 shares	84.6	5.4	6.5
2,000 to 4,999 shares	89.3	3.0	8.1
5,000 to 9,999 shares	91.6	1.3	7.5
10,000 or more shares	92.8	0.3	3.8
Wholesalers:			
Less than 100 shares	33.6	30.1	67.1
100 to 499 shares	70.7	13.4	48.1
500 to 1,999 shares	66.6	5.6	95.0
2,000 to 4,999 shares	54.8	4.3	93.7
5,000 to 9,999 shares	59.0	2.1	84.5
10,000 or more shares	83.8	0.3	60.7
All Market Centers and Order Sizes	90.04	3.22	15.94

Table 6: Immediate-Or-Cancel (IOC) Share Volume, October 2018–October 2019. This table shows the percentage of market and marketable limit orders submitted with IOC instructions, along with the fill rates of those orders, using data from the Tick Size Pilot B.II Market and Marketable Limit Order dataset. *See supra* note 723 for data description. This dataset contains an ''IOC'' flag, which is equal to ''Y'' if the order is an IOC order. The Commission excluded orders outside of regular trading hours and identified retail wholesaler orders as orders originating from seven trading center codes that the Commission understands to be retail wholesalers.

This is especially likely to be the case for wholesalers. The Commission understands that IOC orders received by wholesalers are typically institutional orders that are pinged in the wholesalers' SDPs to see if any contra-side volume is available. This is supported by Table 6, which shows that the differences between fill rates for IOC and non-IOC orders are particularly stark for these market centers: While wholesaler fill rates range between 60% and 95% for non-IOC orders, they are mostly below 30% for IOC orders, and even smaller for larger order sizes, dropping to just 0.3% for orders for 10,000 shares or more. This is again consistent with the idea that wholesalers' IOC orders may represent institutional orders that are routed to their SDPs. Co-mingling SDP activity with other market center activity may obscure differences in execution quality or distort the general execution quality metrics for the market center.[724] Similarly, grouping together IOC orders along with other types of market and marketable orders could impose a significant downwards skew on the fill rates, in particular for larger order sizes and orders handled by wholesalers. This may impact market centers' incentives to achieve better execution quality for marketable orders.[725]

(8) Riskless Principal Orders

The Commission believes that current reporting of riskless principal transactions[726] leads to the duplicative reporting of these orders, and creates uncertainty about how many orders are internalized by off-exchange market centers, particularly wholesalers.

In a riskless principal transaction, a market center routes a principal order to a second market center, typically an exchange or ATS, in order to fulfill a customer order; upon execution at the second market center, the first market center executes the customer transaction on the same terms as it received from the principal execution at the second market center. Currently, for the purposes of Rule 605 reporting, both the first and second market centers in this example would report the riskless principal transaction as having been executed at the market center under Rule 605(a)(1)(i)(D), rather than as a part of the cumulative number of shares of covered orders executed at any other venue under Rule 605(a)(1)(i)(E).[727]

[723] *See* Tick Size Pilot Plan. This dataset contains information for approximately 2,400 small cap stocks for a period from April 2016 to March 2019. Orders with special handling codes are discarded, as are orders marked as short sales (''SS''). Note that, as the Tick Size Pilot collected data only for small cap stocks, these time-to-executions are not necessarily representative of all stocks. For example, larger market cap stocks may be traded more actively by institutional investors, and therefore would likely have higher IOC volumes.

[724] *See supra* section VII.C.2.(a)(2) for further discussion of co-mingling SDP activity with other market center activity.

[725] For example, if a market center's Rule 605 reports reveals low fill rates for market orders simply because it handles a large amount of marketable IOCs, it may not be incentivized to improve its fill rates for other types of market orders since the higher fill rates of these orders would be obscured by the low fill rates of marketable IOCs.

[726] *See supra* note 416 and accompanying text for a definition and discussion of riskless principal transactions.

[727] *See supra* note 417 and accompanying text. In contrast, for the purposes of SIP reporting, the away market center is required to report the principal transaction to the tape, while the receiving market center would post a non-tape (regulatory or clearing-only) report to reflect the offsetting riskless customer transaction. When the initial leg of the transaction takes place on and is reported through an exchange, members are instructed not to report the customer transaction for public dissemination purposes, as that would result in double (tape) reporting of the same transaction. *See* Trade Reporting Frequently Asked Questions, answers to Questions 302.2 and 302.4, *available at https://www.finra.org/filing-reporting/market-transparency-reporting/trade-reporting-faq.*

The Commission believes that, particularly in the case of riskless principal transactions that are handled by wholesalers, grouping transactions that are handled on a riskless principal basis together with other orders executed at the market center under Rule 605(a)(1)(i)(D) may obscure information about the extent to which wholesalers internalize orders. Wholesalers primarily choose between two options to execute the individual investor orders that they handle: they either internalize orders by executing orders against their own capital, or they execute orders on a riskless principal basis.[728] While wholesalers' internalized orders are not exposed to competition from other interested parties quoting on external market centers, their riskless principal executions expose individual investor orders to trading interest from market participants other than the wholesaler, which has potential implications for differences in execution quality between these two order types. Currently, both types of orders would be categorized together as orders executed at the market center under Rule 605(a)(1)(i)(D), so market participants would not be able to tell from Rule 605 reports whether a wholesaler internalizes the majority of its individual investor order flow, or executes the majority as riskless principal. Thus, key information that would be useful for investors (particularly individual investors, whose orders are overwhelmingly handled by wholesalers [729]) when interpreting and comparing information about wholesalers' execution quality is currently missing from Rule 605 reports.

(d) Accessibility of Current Rule 605 Reports

Rule 605 currently requires market centers to post their monthly reports on an internet website that is free of charge and readily accessible to the public.[730] There is currently no system or requirement in place for the centralized posting of Rule 605 reports, which results in search costs for market participants. In order to collect a complete or mostly complete set of Rule 605 reports to, for example, select the reporting entity offering the best execution quality in a given stock, a market participant would need to perform the following tasks, for each of the estimated 236 reporting entities that are currently required to prepare Rule 605 reports: [731] first, search the internet for the website(s) of the reporting entity; second, find the area of the reporting entity's website(s) that links to its Rule 605 report; and third, find the correct link and download the appropriate report (or multiple reports, if the information for multiple months is desired).

The process of collecting Rule 605 reports may be simplified by the NMS Plan's requirement that each market center must designate a single Participant to act as the market center's Designated Participant, who is tasked with maintaining a comprehensive list of the hyperlinks provided by its market centers.[732] Furthermore, certain reporting entities' use of third-party vendors to prepare and/or collect Rule 605 reports may also simplify the process of collecting Rule 605 reports, as these vendors typically maintain a centralized repository of the reports that they handle.[733] However, because an individual vendor or Designated Participant may only offer a subset of Rule 605 reports or hyperlinks to reports, which may not be a representative sample of reports, it is still the case that collecting the complete or even a mostly comprehensive set of Rule 605 reports could entail search costs.[734] In order to collect a complete set of reports, market participants may still need to search the websites of and collect reports from multiple vendors or Designated Participants.

3. Markets for Brokerage and Trading Services for NMS Stocks Under Current Rule 605 Disclosure Requirements

(a) Brokerage Services for NMS Stocks

(1) Current Structure of the Market for Brokerage Services

Based on information from broker-dealers' FOCUS Report Form X–17A–5 Schedule II, there were 3,498 registered broker-dealers as of Q2 2022. A portion of these broker-dealers focus their business on individual and/or institutional investors in the market for NMS stocks.[735] These include both carrying broker-dealers, who maintain custody of customer funds and securities, and introducing broker-dealers, who accept customer orders and introduce their customers to a carrying broker-dealer that will hold the customers' securities and cash.[736] The Commission estimates that there are approximately 153 broker-dealers that carry at least one customer trading in NMS stocks and options, [737] and 1,110 broker-dealers that introduce at least one customer trading in NMS stocks and options.[738]

When a customer places an order in an NMS stock with a broker-dealer, the broker-dealer acts as an agent on behalf of that customer, who generally wants to receive the best possible execution of their order.[739] These broker-dealers can generally decide how to route that order for execution to an exchange, a wholesaler, or an ATS, where the trade

[728] *See infra* section VII.C.3.(b)(1) for further discussion of the market for trading services, which includes wholesalers.

[729] *See supra* note 614 for results from an analysis of retail brokers' routing practices.

[730] *See* 17 CFR 242.605(a)(2) (requiring market centers to make their Rule 605 reports ''available for downloading from an internet website that is free and readily accessible to the public. . . .'').

[731] *See supra* section VI.C for a discussion of the estimated number of reporting entities under the proposed amendments.

[732] *See* Section VIII of the Rule 605 NMS Plan. For a description of ''Designated Participant'' as defined in the Plan, *see supra* note 47.

[733] *See, e.g., Disclosure of SEC—Required Order Execution Information,* S&P Global, *available at https://vrs.vista-one-solutions.com/sec605rule.aspx.*

[734] For these reasons and others, EMSAC has suggested considering a centralized location for 605 reports. See EMSAC Recommendations Regarding Rule 605 and 606, SEC, 4, available at https://www.sec.gov/spotlight/emsac/emsac-recommendations-rules-605-606.pdf (stating that ''To further improve standardization and the consistency of reporting, the SEC could consider centralizing report creation in an unbiased and trusted source such as FINRA.''). The Commission also notes that FINRA has proposed requiring members to submit Rule 606(a) order routing reports to FINRA for publication on the FINRA website. See Report from FINRA Board of Governors Meeting, FINRA (Mar. 2022), available at *https://www.finra.org/media-center/newsreleases/2022/report-finra-board-governors-meeting-march-2022* (describing proposed amendments to centrally host SEC Rule 606(a) reports).

[735] Some broker-dealers service only the accounts of other brokers, which are excluded from the definition of customers. *See supra* note 140 for a definition of ''customer.''

[736] *See supra* note 174 for a description of introducing and carrying broker-dealers. Some firms operate a hybrid introducing/carrying broker-dealer by introducing on a fully disclosed basis to a carrying broker-dealer those customers that trade securities for which the broker-dealer is not prepared to provide a full range of services. *See, e.g.,* Securities Exchange Act Release No. 70073 (Aug. 21, 2013), 78 FR 51910 (Aug. 21, 2013) at 51911, 51949, and 51968.

[737] This number is based on the number of broker-dealers that report carrying at least one customer on their 2021 FOCUS Schedule I reports.

[738] This number is based on estimates using broker-dealers FDIDs identified in CAT data during the 2021 calendar year. As CAT data only includes information about NMS stocks and options, broker-dealers that introduce or carry customers trading in other assets classes are not included in these numbers. *See infra* note 1008 for a discussion of the data and methodology for identifying introducing broker-dealers.

[739] Some investors may not value order-level execution quality in all cases. For example, it is the Commission's understanding that when an institutional customer submits a large order to be executed on behalf of one account (*e.g.,* a single mutual fund or pension fund), it expects the broker-dealer that handles and executes such large order to do so in a manner that ensures best execution is provided to the ''parent'' order. *See infra* section VII.C.3.(a)(1)(b) for further discussion.

may be executed or potentially routed further. The high level of fragmentation of NMS stock trading [740] means that broker-dealers have a variety of choices for order routing and execution, and the venue that a broker-dealer chooses may have a tangible effect on the execution quality of an order.

A broker-dealer has a legal duty to seek best execution of customer orders. The duty of best execution predates the federal securities laws and is derived from an implied representation that a broker-dealer makes to its customers.[741] The duty is established from ''common law agency obligations of undivided loyalty and reasonable care that an agent owes to [its] principal.'' [742] This obligation requires that a ''broker-dealer seek to obtain for its customer orders the most favorable terms reasonably available under the circumstances.'' [743]

Investors may incur switching costs when changing broker-dealers, such as the cost of withdrawing or transferring funds and potential administrative fees. Switching broker-dealers could also involve time delays resulting in lost investment opportunities or revenues and other opportunity costs.[744] Furthermore, some customers that rely on broker-dealers' non-execution-related services, such as providing recommendations, holding customers' funds and securities and/or providing analyst research, may find it more costly to switch broker-dealers, as these services would be more difficult to transfer across broker-dealers. However, the Commission understands that some broker-dealers, including some that cater to individual investors, will compensate new customers for transfer fees that their outgoing broker-dealer may charge them, which would result in lower (or even zero) switching costs.[745] The Commission understands that some investors, particularly institutional investors, are likely to use multiple broker-dealers,[746] which would tend to lead to lower switching costs as a customer that is unhappy with one broker-dealer could simply use one of their other broker-dealers to handle those orders.

The Commission understands that the structure of the market for brokerage services can broadly be separated into two distinct markets—brokerage services for individual investors on the one hand, and brokerage services for institutional investors on the other—that differ somewhat in terms of their market structure.

(a) Brokerage Services for Individual Investors

As of the end of 2021, there were approximately 1,037 registered broker-dealers that originated orders on behalf of individual investors in the market for NMS stocks.[747] Unlike institutional investors, individual investors generally use a single broker to handle their orders. Retail brokers can broadly be divided into ''discount'' brokers and ''full-service'' brokers.[748] Competition between discount brokers for the business of individual investors in particular has recently resulted in many new entrants and a decline in commissions to zero or near zero.[749] Instead of commissions on certain transaction, these discount brokers earn revenue through other means, including, among other products and services, interest on margin accounts and from lending securities, as well as broker-wholesaler arrangements involving PFOF paid by the wholesaler to the retail broker. Discount broker-dealers can distinguish themselves by the accessibility and functionality of their trading platform, which can be geared towards less experienced or more sophisticated investors, and by providing more extensive customer service as well as tools for research and education on financial markets.

(b) Brokerage Services for Institutional Investors

As of the end of 2021, there were approximately 909 registered broker-dealers that originated institutional orders in the market for NMS stocks.[750] One feature that distinguishes the market for institutional brokerage services is that a significant portion of institutional investor orders are generally ''not held'' orders.[751] A broker-dealer has time and price discretion in executing a not held order, and institutional investors in particular rely on such discretion for various reasons including minimizing price impact.[752] Due to the large size of institutional trading interests, broker-dealers will often split orders when handling their orders, often through the use of SORs. Specifically, a broker-dealer or its SOR will split up a ''parent'' order into multiple ''child'' orders, with the goal of executing the child orders in a way that achieves the

[740] *See infra* section VII.C.3.(b)(1) for a breakdown of trading in NMS stocks across various types of trading venues.

[741] *See, e.g., Newton* v. *Merrill, Lynch, Pierce, Fenner & Smith, Inc.,* 135 F.3d 266, 270 (3d Cir.), *cert. denied,* 525 U.S. 811 (1998).

[742] *See id.*

[743] *See id. See also* Securities Exchange Act Release No. 37619A (Sept. 6, 1996), 61 FR 48290 (Sept. 12, 1996) (''Order Execution Obligations Adopting Release''). A Report of the Special Study of Securities Markets stated that ''[t]he integrity of the industry can be maintained only if the fundamental principle that a customer should at all times get the best available price which can reasonably be obtained for him is followed.'' *See* SEC Report of the Special Study of Securities Markets, H.R. Doc. No. 95, 88th Cong., 1st Sess. Pt. II, 624 (1963) (''Special Study'').

[744] *See, e.g., Understanding the Brokerage Account Transfer Process,* FINRA, *available at https://www.finra.org/investors/learn-to-invest/brokerage-accounts/understanding-brokerage-account-transfer-process.*

[745] *See, e.g.,* Scott Connor, *Thinking about Switching to TD Ameritrade? Transferring is Easier than You Might Think,* TD Ameritrade (Oct. 17, 2019), *available at https://tickertape.tdameritrade.com/investing/how-to-switch-brokers-17755* (''If your broker does charge you a transfer fee, TD Ameritrade will refund you up to $100.'').

[746] For example, one academic paper finds that institutional investors tend to break up larger orders and spread them out across multiple broker-dealers, as a strategy to avoid information leakage. *See, e.g.,* Munhee Han & Sanghyun (Hugh) Kim, Splitting and Shuffling: Institutional Trading Motives and Order Submissions Across Brokers (working paper Sept. 30, 2020), *available at https://ssrn.com/abstract=3429452* (retrieved from SSRN Elsevier database).

[747] This number is estimated using the CAT data described *infra* in note 1008. Individual investor accounts are identified in CAT as accounts belonging to the ''Individual Customer'' account type, defined as accounts that do not meet the definition of FINRA Rule 4512(c) and are also not proprietary accounts. *See supra* note 609 for more information about account types in CAT.

[748] Note that there is not necessarily a precise delineation between full-service and discount brokers. Discount brokers generally provide execution-only services, typically at a reduced or zero commission rate. Full-service brokers (as they are commonly called) typically charge commissions in exchange for a package of services, including execution, incidental investment advice, and custody. *See, e.g.,* Interpretive Rule Under the Advisers Act Affecting Broker-Dealers, Advisers Act Release No. 2652 (Sept. 24, 2007), notes 2 and 20.

[749] *See, e.g.,* Samuel Adams & Connor Kasten, *Retail Order Execution Quality under Zero Commissions,* (working paper Jan. 7, 2021), *available at https://ssrn.com/abstract=3779474* (retrieved from SSRN Elsevier database), describing how ''on October 1st, 2019, Charles Schwab announced that they would cut commissions from $4.95 per trade to zero on all retail trades starting on October 7th. Within hours, TD Ameritrade followed by announcing they would cut commissions to zero from $6.95 beginning on October 3rd. By January 3rd, Vanguard, Fidelity, and E*TRADE had joined the trend in offering free equity trades for retail investors.''

[750] This number is estimated using the CAT data described in *infra note* 1008. Institutional investor accounts are identified in CAT as accounts belonging to the ''Institutional Customer'' account type, defined as accounts that meet the definition in FINRA Rule 4512(c). *See supra* note 609 for more information about account types in CAT.

[751] *See supra* note 538 discussing an analysis showing that institutional investors are more likely than individual investors to use not held orders.

[752] *See* 2018 Rule 606 Amendments Release, 83 FR 58338 nn.60–61 and corresponding text. Meanwhile, a broker-dealer must attempt to execute a held order immediately, which typically better suits individual investors who seek immediate executions and rely less on broker-dealer order handling discretion.

best execution for the parent order.[753] For example, a broker-dealer may not execute a child order at the best price, if doing so could result in a larger price impact and increases the overall cost of working a parent order. For this reason, most institutional parent orders are handled by broker-dealers on a not held basis, which would exclude these orders from Rule 605 execution quality disclosure requirements.[754] However, since 2018, broker-dealers are required by Rule 606(b)(3) to provide individualized reports of execution quality of not held orders upon request.[755]

(2) Competition Between Broker-Dealers on the Basis of Execution Quality

Broker-dealers compete with one another along a variety of dimensions,[756] including the execution quality that they offer, and make their execution quality known in a variety of ways. For example, at least one broker-dealer published execution quality reports using the FIF template,[757] and furthermore some broker-dealers disclose their own execution quality metrics on their websites.[758] Broker-dealers may seek to improve their competitive position on the basis of execution quality by, for example, investing in the speed and quality of their routing technology. Broker-dealers may also compete on the basis of execution quality by reevaluating their routing strategies to increase the extent to which they route orders to the market centers offering better execution quality.

As discussed above,[759] when making routing decisions, some broker-dealers may face conflicts of interest that misalign their interests with their customers' interest in receiving better execution quality. These conflicts of interest could result, for example, from broker-dealer affiliations with market centers. Some broker-dealers operate or are otherwise affiliated with ATSs, which implies a possible conflict of interest relative to their customers' best interests in that these broker-dealers may give preference to routing orders to their own ATSs, where they typically pay lower transaction fees, even if their customer would have received better execution quality if the order were routed to another trading venue. At least one academic study has shown that broker-dealers that route orders to their ATSs obtain worse execution quality.[760] Similarly, presence of liquidity fees and rebates on some market centers may incentivize broker-dealers to make routing decisions based on where they can receive the highest rebate (or pay the lowest fee), rather than where they can receive better execution quality on behalf of their customer.[761] For example, a recent research paper analyzed the relation between maker-taker fee schedules and order routing, and found a negative relation between take fees and limit order execution quality.[762] Another potential conflict of interest, particularly with regard to individual investor order flow, includes the receipt of PFOF, which may result in broker-dealers routing orders to wholesalers as a result of the terms of the PFOF arrangements.[763]

If information asymmetries, such as those resulting from insufficient public information about broker-dealer execution quality,[764] prevent investors from observing differences in execution quality across broker-dealers, this would limit the extent to which broker-dealers would need to keep these conflicts of interest in check and compete on the basis of execution quality.

(b) Trading Services for NMS Stocks

(1) Current Structure of the Market for Trading Services

Trading services for NMS stocks are highly fragmented among different types of market centers.[765] Table 7 shows that in Q1 of 2022, NMS stocks were traded on 16 national securities exchanges and off-exchange at 32 NMS Stock ATSs and at over 230 other FINRA members, including 6 wholesalers that internalize the majority of individual investor marketable orders.[766] National securities exchanges execute approximately 60% of total share volume in NMS stocks, while off-exchange market centers execute approximately 40% of total share volume.[767] The majority of off-exchange volume is executed by wholesalers, who execute almost one quarter of total share volume (23.9%) and about 60% of off-exchange volume. Some OTC market makers, such as wholesalers, operate SDPs through which they execute institutional orders in NMS stocks against their own inventory.[768] SDPs accounted for approximately 4% of total trading volume in Q1 2022.[769] As of June 2022, the Commission estimates that there are currently 236 market centers to which Rule 605 applies.[770]

[753] *See* Tyler Beason & Sunil Wahal, *The Anatomy of Trading Algorithms,* (working paper Jan. 21, 2021), *available at https://ssrn.com/abstract=3497001* (retrieved from SSRN Elsevier database).

[754] Note that some child orders may be held orders and thus would be required to be included in Rule 605 reports.

[755] *See supra* note 60 and accompanying text discussing broker-dealers requirements under Rule 606(b)(3) to provide individualized reports of execution quality upon request for not held orders.

[756] For example, broker-dealers may compete by charging lower commissions for trading, or by offering a wider range of services or functionalities, such as trading in additional asset classes such as options.

[757] *See supra* note 554.

[758] *See supra* note 506 for examples.

[759] *See supra* section VII.C.2.(a)(1).

[760] *See* Amber Anand, Mehrdad Samadi, Jonathan Sokobin & Kumar Venkataraman, *Institutional Order Handling and Broker-Affiliated Trading Venues,* 34 Rev. Fin. Studies 3364 (2021).

[761] *See, e.g.,* Robert H. Battalio, Shane A. Corwin, & Robert H. Jennings, *Can Brokers Have It All? On the Relation Between Make-Take Fees and Limit Order Execution Quality,* 71 J. Fin. 2193 (2016).

[762] *See id.* The authors ''document a strong negative relation between take fees and several measures of limit order execution quality. Based on this evidence, [they] conclude that the decision of some national brokerages to route all nonmarketable limit orders to a single exchange paying the highest rebate is not consistent with the broker's responsibility to obtain best execution for customers.''

[763] The study by Schwarz et al. (2022) in *supra* note 529 does not find a relationship between the amount of PFOF a retail broker receives and the amount of price improvement their customers' orders receive. However, the authors noted that the variation in the magnitude of price improvement they saw across retail brokers was significantly greater than the amount of PFOF the retail broker received, which could indicate their sample was not large enough to observe a statistically significant effect.

[764] *See supra* section VII.C.2.(a)(1) discussing broker-dealers' current execution quality reporting requirements.

[765] Some academic studies attribute the highly fragmented nature of this market to implementation of Regulation NMS. *See, e.g.,* Maureen O'Hara & Mao Ye, *Is Market Fragmentation Harming Market Quality?,* 100 J. Fin. Econ. 459 (2011); Amy Kwan, Ronald Masulis & Thomas H. MacInish, *Trading Rules, Competition for Order Flow and Market Fragmentation,* 115 J. Fin. Econ. 330 (2015).

[766] *See* Concept Release on Equity Market Structure, 75 FR 3594, 3598–3560 (Jan. 21, 2010) (for a discussion of the types of trading centers); *see also* Form ATS–N Filings and Information, *available at https://www.sec.gov/divisions/marketreg/form-ats-n-filings.htm.* These wholesalers were determined based on marketable order routing information from retail broker Rule 606(a)(1) reports.

[767] This analysis uses data from prior to the implementation of the MDI Rules. The implementation of the MDI Rules may result in a change in the flow of orders across trading venues, which may result in numbers that are different from those reported here. However, the Commission is uncertain of the magnitude of these effects. *See supra* section VII.C.1.(d)(2) for further discussion.

[768] *See* Rosenblatt Securities (2022), US Equity Trading Venue Guide. Wholesalers and OTC market makers can execute orders themselves or route orders to be executed on other venues. An SDP always acts as the counterparty to any trade that occurs on the SDP. *See, e.g., Where Do Stocks Trade?,* FINRA (Dec. 3, 2021), *available at https://www.finra.org/investors/insights/where-do-stocks-trade.*

[769] *See* Rosenblatt Securities (2022), US Equity Trading Venue Guide.

[770] *See supra* section VI.C for a discussion of this estimate. Some market centers may not be required to prepare Rule 605 reports, for example, if they do not handle any covered orders.

TABLE 7—NMS STOCK TRADED SHARE VOLUME PERCENTAGE BY MARKET CENTER TYPE

Market center type	Venue count	Share volume (% of total volume)	Off-exchange share volume (% of total off-exchange)
NMS Stock ATSs	32	10.2	25.2
National Securities Exchanges	16	59.7	.....
Wholesalers	6	23.9	59.4
Other FINRA Members	232	6.3	15.6

Table 7: NMS Stock Traded Share Volume Percentage by Market Center Type. This table reports the percentage of all NMS stock executed share volume and the percentage of NMS stock share volume executed off-exchange for different types of market centers for Q1 2022, including lists the number of venues in each market center category. Exchange share volume and total market volume are based on CBOE Market Volume Data on monthly share volume executed on each exchange *available at: https://cboe.com/us/equities/market_statistics/historical_market_volume/.* NMS Stock ATS, wholesaler and FINRA member share volume are based on monthly data from FINRA OTC (Non-ATS) Transparency Data Monthly Statistics, *available at: https://otctransparency.finra.org/otctransparency/OtcData;* and FINRA ATS Transparency Data Monthly Statistics, *available at: https://otctransparency.finra.org/otctransparency/AtsBlocksDownload.* This analysis uses data from prior to the implementation of the MDI Rules and specific numbers reported may be different following the implementation of the MDI Rules. *See supra* note 767 and section VII.C.1.(d)(2).

These market centers, among other things, match traders with counterparties, provide a framework for price negotiation and provide liquidity to those seeking to trade, to supply investors with execution services at efficient prices. Market centers' primary customers are the broker-dealers that route their own orders or their customers' orders for execution at the trading center, and market centers compete with each other for these customers on a number of dimensions, including execution quality.

Broker-dealers may face switching costs from changing the primary trading venues to which they route orders. For example, the extent to which broker-dealers may have long-term contractual arrangements to route orders to specific market centers would hamper their ability to switch trading venue. The common practice across national securities exchanges of setting fee and rebate schedules where specific tiers are determined by execution volume [771] may also make it difficult of broker-dealers to transfer order flow between market centers. Volume-based tiering gives broker-dealers an incentive to concentrate orders on a given exchange, not because that exchange may offer the best execution quality but because doing so can allow a broker-dealer to execute sufficient volume on the exchange to qualify for a better tier and receive a lower fee or higher rebate. In addition, for national securities exchanges, upfront connectivity fees associated with establishing a connection to a new exchange could also discourage switching.

While national securities exchanges cater to a broader spectrum of investors, ATSs and OTC market makers, including wholesalers, tend to focus more on providing trading services for either institutional or individual investor order flow. For example, an analysis of retail brokers' routing practices showed that a group of six wholesalers handled more than 87% of the customer orders of retail brokers in Q1 2022.[772] Meanwhile, SDPs are mainly used for institutional orders, to avoid exposure to potentially more informed order flow on other trading venues.[773]

(2) Competition Between Trading Venues on the Basis of Execution Quality

Trading venues compete with one another on the basis of the execution quality that they offer, as well as on the basis of other potential factors.[774] As discussed above, Rule 605 reports are currently a useful proxy that investors and their broker-dealers can use to assess and compare the execution quality that they can expect to receive across market centers,[775] and there is evidence that broker-dealers factor in information about the execution quality of market centers from Rule 605 reports when making their order routing decisions. One academic study attributes a significant decline in effective and quoted spreads following the implementation of Rule 605 to an increase in competition between market centers, who improved the execution quality that they offered in order to attract more order flow.[776] Market centers may seek to improve their competitive position on the basis of execution quality by, for example, investing in the speed and quality of their execution technology.

Market centers have less of an incentive to compete and innovate on execution quality to the extent that broker-dealers route orders for reasons other than execution quality. As discussed above, if information asymmetries, such as those resulting from insufficient public information about broker-dealer execution quality, prevent investors from observing differences in execution quality across broker-dealers, this would limit the extent to which broker-dealers would need to compete on the basis of execution quality.[777] Market centers also have less of an incentive to compete on the basis of execution quality to the extent that broker-dealers and other market participants are less able to use Rule 605 reports to compare execution quality across market centers, for example, as a result of erosions to the information content of Rule 605 statistics due to changes in market conditions,[778] or to the extent that Rule

[771] Some national securities exchanges typically currently use volume calculated on a monthly basis to determine the applicable threshold or tier rate. *See, e.g.,* fee schedules of NASDAQ PSX, *available at https://listingcenter.nasdaq.com/rulebook/phlx/rules/Phlx%20Equity%207* (as of July 2022) (calculating fees based on ''average daily volume during the month''); and *Cboe EDGA,* EDGA Equities Fee Schedules, *available at https://www.cboe.com/us/equities/membership/fee_schedule/edga/* (as of Apr. 1, 2022) (calculating fees based on ''average daily volume'' and ''daily volume'' on a monthly basis).

[772] *See supra* note 614 for more details about this analysis.

[773] *See, e.g.,* Yashar H. Barardehi, et al., *Internalized Retail Order Imbalances and Institutional Liquidity Demand* (working paper revised May 23, 2022), *available at https://ssrn.com/abstract=3966059* (retrieved from SSRN Elsevier database).

[774] For example, national securities exchanges may adjust fees and rebates to incentivize broker-dealers to route more order flow to them. The use of liquidity rebates have also allowed national securities exchanges to compete with off-exchange market centers for order flow by making it more expensive to offer price improvement over the displayed NBBO. *See* Transaction Fee Pilot for NMS Stocks, 84 FR 5202 (Feb. 20, 2019) at 5255.

[775] *See supra* section VII.C.1.(a).

[776] *See* Zhao & Chung.

[777] *See supra* section VII.C.3.(a)(2).

[778] For example, market centers may be less incentivized to compete on the basis of execution

Continued

605 does not include some relevant order sizes or types.[779]

D. Economic Effects

The proposed amendments modifying the reporting requirements under Rule 605 may result in numerous beneficial economic effects. These economic effects would mainly derive from improvements in the transparency of execution quality of broker-dealers and market centers, which would promote competition among these reporting entities on the basis on execution quality. However, the proposed amendments to Rule 605 may also result in initial and ongoing compliance costs to reporting entities.

As discussed above, this section measures the economic effects of the proposed amendments relative to a regulatory baseline that includes the implementation of the MDI Rules.[780] Furthermore, this section reflects the Commission's assessment of the anticipated economic effects, including potentially countervailing or confounding economic effects from the MDI Rules.[781] However, given that the MDI Rules have not yet been implemented, they have not affected market practice and therefore data that would be required for a comprehensive quantitative analysis of the economic effects that includes the effects of the MDI Rules is not available. It is possible that the economic effects relative to the baseline could be different once the MDI Rules are implemented. Where implementation of the above-described MDI Rules may affect certain numbers, the description of the economic effects below notes those effects.

1. Benefits

The Commission believes that the proposed amendments would promote increased transparency of order execution quality as a result of the expansion and modernization of Rule 605 disclosure requirements, as well as a requirement for reporting entities to prepare summary reports, which would improve market participants' ability to use Rule 605 reports and the information contained therein to compare execution quality across reporting entities. This in turn would lead to increased competition between reporting entities on the basis of execution quality, leading to improvements in the execution quality received by investors as competition between reporting entities would be create incentives to offer better execution quality in order to attract and retain customers and order flow.

(a) Increase in Transparency and Access to Information About Execution Quality

The Commission believes that the proposed amendments would promote increased transparency of order execution quality, particularly for larger broker-dealers who were not previously required to disclose execution quality information under Rule 605, but also for all reporting entities, whose execution quality information would be more relevant and easier to access as a result of improvements to existing Rule 605 disclosure requirements.

(1) Expanding the Scope of Reporting Entities

(a) Expanding Requirements for Larger Broker-Dealers

The proposed amendment expanding the scope of Rule 605 reporting entities to include larger broker-dealers[782] would increase transparency into the differences in execution quality achieved by these broker-dealers when they route customer orders to execution venues.[783] Broker-dealers that route customer orders have many choices about where to route customer orders for execution,[784] and their routing decisions affect the execution quality that their customers' orders receive.[785] To ensure that they are directing their orders to the broker-dealer(s) that are able to achieve better execution quality, investors, along with other market participants, have a vested interest in their ability to accurately assess the execution quality that their broker-dealers are able to achieve. However, in the current regulatory environment, the ability of some customers to assess the execution quality that their broker-dealers are providing for their held orders may be limited.[786]

As a result of the proposed amendments, customers of these broker dealers, along with other market participants, would no longer need to make inferences about these broker-dealers' execution quality based on broker-dealer routing information from Rule 606 data combined with market centers' execution quality information from Rule 605 data, but would have access to direct information about the aggregate execution quality achieved by these broker-dealers.[787] Customers could then use this information to compare across broker-dealers and select those broker-dealers offering better execution quality. Furthermore, combined with information about broker-dealers' payment relationships with execution venues in quarterly reports prepared pursuant to Rule 606(a)(1), information about the aggregate execution quality obtained by larger broker-dealers that are in the business of routing customer orders would give market participants and other interested parties access to key information that would facilitate their ability to evaluate how these payment relationships may affect execution quality.

Under the proposed amendments, larger broker-dealers would be required to categorize the execution quality information required by Rule 605 using the same categories that market centers would be required to use, including by individual security, different types of orders, and different order sizes. As with market centers, a particular broker-dealer's order flow may be made up of a different mixture of securities, order types, and order sizes, which may impact or constrain that broker-dealer's

speed to the extent that, as a result of rapid increases in the speed of trading, market participants are less able to use time-to-execution measures from Rule 605 reports to compare across market centers. *See supra* section VII.C.2.(c)(4) for further discussion.

[779] For example, market centers may be less likely to compete on the basis of execution quality for orders of less than 100 shares, since these orders are not required to be included in Rule 605 reports. *See supra* section VII.C.2.(b)(1)(*b*) for further discussion.

[780] *See supra* section VII.C.1.(d).

[781] *See supra* section VII.C.1.(d)(2) for a discussion of the Commission's anticipated economic effects of the MDI Rules as stated in the MDI Adopting Release.

[782] *See supra* section III.A for further discussion of the proposed amendments related to the expansion of Rule 605 reporting entities to include larger broker-dealers.

[783] The EMSAC and commenters generally supported expanding the Rule's scope beyond market centers, including to broker-dealers. *See supra* notes 103–119 and accompanying text. The Commission believes that these effects would principally accrue to larger broker-dealers, who would be required to prepare Rule 605 reports, but may spill over to effect smaller broker-dealers as well. *See* discussion in *infra* section VII.D.1.(d)(1).

[784] *See supra* section VII.C.3.(b)(1), discussing fragmentation in the market for trading services for NMS stocks.

[785] *See, e.g., supra* note 529 and accompanying text, describing a recent academic working paper finding significant variations in execution quality across broker-dealers.

[786] *See supra* section VII.C.2.(a)(1) for a discussion of limitations to investors' abilities to use Rule 606 and Rule 605 reports to estimate the execution quality achieved by broker-dealers. Note that institutional investors may have access to alternative sources of information about execution quality. *See supra* section VII.C.1.(c)(2) for a discussion.

[787] This effect would be enhanced by the requirement that broker-dealers publish Rule 605 reports for their broker-dealer activities separately from activities related to the market center(s) that they may operate, which would allow investors to access execution quality information that is exclusively related to the firm's broker-dealer operations. *See supra* note 182 and accompanying text.

overall execution quality level.[788] For example, Figure 14, which uses a week of CAT data [789] to break down broker-dealer order flow into different order types, shows that broker-dealers indeed handle a variety of order types, including both marketable and non-marketable orders, for both their individual and institutional investor customers. Giving market participants access to this information in Rule 605 reports would ensure that they are able to control for these differences in order flow characteristics when assessing and comparing execution quality information across broker-dealers.

Figure 14: Broker-Dealer Order Volume by Order Type, January 3–7, 2022

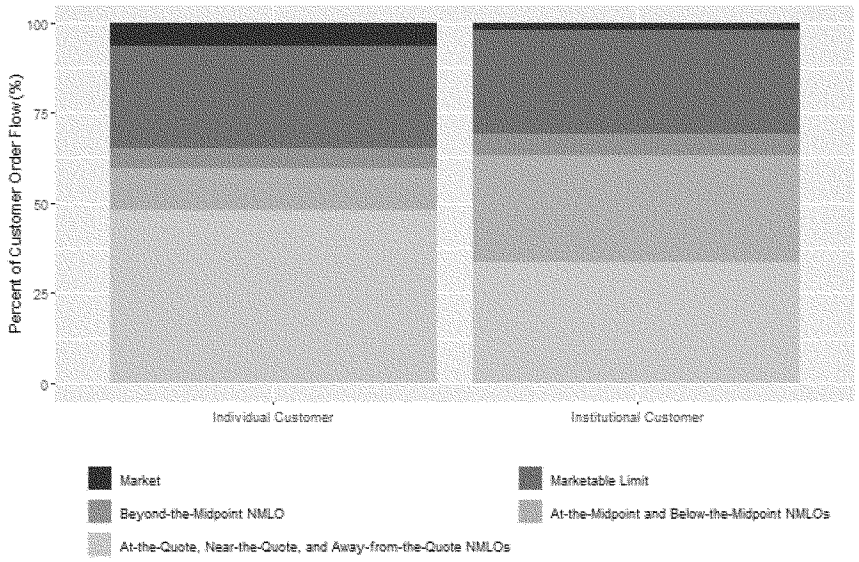

Figure 14: Broker-Dealer Order Volume by Order Type, January 3-7, 2022. This figure shows the distribution of customer order flow, in terms of the percentage of the total number of submitted orders, across different order types for both individual investor and institutional investor customers, using a sample of CAT data for NMS stocks for the period of January 3 to January 7, 2022. See supra note 609 for dataset description.

The proposed amendment for larger broker-dealers to report both the number of shares executed at the receiving broker-dealer and the number of shares executed at any other venue [790] would ensure that Rule 605 reports capture the execution quality of all orders that larger broker-dealers receive for execution as part of their customer-facing broker-dealer function. The majority of executions resulting from a firm's broker-dealer operations would likely be categorized as away-executed shares in the Rule 605 reports associated with its broker-dealer operations.[791] While these shares would not be categorized as being directly executed by the broker-dealer, it is likely that market participants understand that execution quality can depend significantly on the broker-dealers' order handling and routing practices.

The proposed amendments would also require larger broker-dealers to report the same execution quality information as market centers, including information about execution prices, execution speeds, and fill rates,[792] as well as, as a result of the proposed amendments, information about size improvement.[793] The Commission acknowledges that there are certain ways in which broker-dealers may systematically differ from market centers in terms of their execution quality statistics; for example, due to their need to reroute orders that they receive for execution, broker-dealers are likely to have a longer execution time as measured from the time of order receipt, as compared to market centers who can execute orders immediately without the need to reroute. However, these differences are generally well-known to market participants, who would be able to account for these differences in assessing execution quality. Furthermore, it is unlikely that market participants would use information in Rule 605 reports to compare broker-dealers to market centers, as information about the execution quality of these two types of reporting entities is useful to different market participants for fundamentally different purposes. In terms of the principal-agent problems described in the Market Failure section,[794] information about execution quality for broker-dealers solves a different principal-agent problem than information about execution quality for market centers. Broker-dealers' Rule 605 reports would be more likely to be used by broker-dealers' customers to compare execution quality across broker-dealers to alleviate the principal-agent problem that exists between broker-dealers and their customers. In contrast, market

[788] *See supra* note 513 for an example of how differences in order flow characteristics may impact inferences about execution quality.

[789] *See supra* note 609 for dataset description.

[790] *See* 17 CFR 242.605(a)(1)(i)(D) and (E). As discussed herein, the Commission is proposing to modify Rule 605(a)(1)(i)(D) to also cover the number of shares executed at the receiving broker or dealer. *See supra* note 155 and accompanying text.

[791] To the extent that a broker-dealer also acts as a market center, any executions that it handles would be required to be published in the Rule 605 report(s) that it files in its capacity as a market center.

[792] *See supra* section VII.C.1.(a) for a discussion of the economic significance of the execution quality information currently required by Rule 605 to be disclosed by market centers.

[793] *See* proposed Rule 605(a)(1)(i)(F) and discussion in *supra* section IV.B.4.(e).

[794] *See supra* section VII.B.

centers' Rule 605 reports would continue to be more useful for broker-dealers to compare execution quality across market centers to alleviate the principal-agent problem that exists between broker-dealers and the market centers to which they route their customers' orders.

The Commission is mindful that Rule 605's execution quality reports contain a large volume of statistical data, and as a result it may be difficult for individual investors to review and digest the reports. By requiring larger brokers-dealers to report stock-by-stock order execution information in a uniform manner, the current proposal would make it possible for market participants and other interested parties to make their own determinations about how to group stocks or orders when comparing execution quality across broker-dealers. Requiring larger broker-dealers to produce more detailed execution quality data would also help ameliorate potential concerns about overly general statistics, or about the specific categorization of orders and selection of metrics in the summary reports, by allowing market participants and other interested parties to conduct their own analysis based on alternative categorizations of the underlying data. Should certain market participants not have the means to directly analyze the detailed statistics,[795] independent analysts, consultants, broker-dealers, the financial press, and market centers likely will continue to respond to the needs of investors by analyzing the disclosures and producing more digestible information using the data to the extent that they currently do so.[796] Furthermore, requiring all market centers and larger broker-dealers to prepare summary reports with aggregated execution quality information[797] as well as Rule 605 reports would strike a balance between ensuring that market participants have access to detailed execution quality information, and providing an overview of execution quality information that may be more accessible for some market participants.[798]

(b) Specifying and Expanding Requirements for Market Centers

In addition to the proposed amendment expanding the scope of Rule 605 reporting entities to include larger broker-dealers, the Commission believes that additional proposed modifications to the scope of reporting entities would also promote increased transparency.

A proposed amendment specifies that broker-dealers that operate ATSs must prepare Rule 605 reports for their ATSs that are separate from the reports for their other trading activities.[799] Another proposed amendment requires that market centers operating SDPs post separate reports for each entity.[800] These amendments would address directly what Rule 605 requires with respect to reporting by firms that operate multiple market centers, thus increasing the transparency of each reporting entity's execution quality and limiting the co-mingling of information about multiple types of reporting entities into a single report, which, to the extent that it occurs, may currently add noise to or skew Rule 605 reports. For example, requiring market centers that operate SDPs to report statistics separately for each line of business would increase the transparency of the operating market centers' fill rates by eliminating the downwards skew from including ''pinging'' orders submitted to the SDP into their Rule 605 reports.[801] Market participants would be better informed about the execution quality of each reporting entity, which would facilitate comparisons across reporting entities.

If the Order Competition Rule Proposal is adopted,[802] the proposed amendment requiring separate Rule 605 reports for qualified auctions[803] would also promote increased transparency. First, it would allow for easier comparisons of how execution quality varies across qualified auctions. Second, it would limit the extent to which co-mingling qualified auction statistics with other orders executed on a market center add noise to or skew that market center's Rule 605 report. For example, orders submitted to a qualified auction may be more likely to receive price improvement, and may have systematically different fill rates and time-to-executions, as compared to similar orders executed in other trading mechanisms.[804]

The proposed amendment expanding the order size categories required by Rule 605 to include information about fractional shares[805] would also expand the scope of reporting entities to include an estimated 20 additional market centers[806] that currently exclusively execute fractional shares and that were previously not required to file Rule 605 reports due to fractional shares falling below the smallest order size category in the current Rule 605. This would increase transparency about the execution quality achieved by these market centers.

(2) Modifications to Rule 605 Disclosure Requirements

The Commission believes that, as a result of the proposed amendments expanding and modernizing Rule 605 disclosure requirements, the metrics contained in Rule 605 would be more informative about execution quality, which would increase transparency into the differences in execution quality achieved by reporting entities. These improvements in transparency would stem from modifications aimed at clarifying and expanding the scope of Rule 605 reporting entities, modernizing the information required to be reported under Rule 605, and improving the accessibility of the information contained in Rule 605 reports.

(a) Expanding the Definition of Covered Orders

The proposed amendments expanding the definition of covered orders to include additional order types would increase transparency about the execution quality that reporting entities achieve for these additional order types, including orders submitted outside of regular trading hours, orders submitted with stop prices, and non-exempt short sale orders.[807]

[795] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75419 (stating that most individual investors likely would not obtain and digest the reports themselves). *See also supra* note 112 and accompanying text (EMSAC committee member stating that retail investors will not look at the Rule 605 reports); Angel Letter at 3 (commenter stating that Rule 605 data is too raw for most investors to interpret); and *See* Consumer Federation II at 10 (commenter stating that most retail investors may not use the disclosures directly).

[796] *See, e.g., supra* notes 545–547, describing the use of Rule 605 data in academic literature, in comment letters related to Commission and SRO rulemaking, and the financial press.

[797] *See* proposed Rule 605(a)(2).

[798] Several EMSAC committee members argued in favor of requiring broker-dealers to file Rule 605 reports rather than only summary reports. *See supra* notes 112–114 and accompanying text.

[799] *See* proposed Rule 605(a)(1). *See also supra* note 214 and accompanying text. *See supra* note 212 and accompanying text for discussion of suggestions from the EMSAC and commenters related to reporting requirements for ATSs.

[800] *See* proposed Rule 605(a)(1). *See also supra* note 219 and accompanying text.

[801] *See supra* section VII.C.2.(a)(2) for a discussion of why the co-mingling of wholesaler and SDP orders for the purposes of Rule 605 reporting will effect a downwards skew on the fill rates derived from the wholesalers' Rule 605 reports.

[802] *See* Order Competition Rule Proposal.

[803] *See* proposed Rule 605(a)(1). *See also supra* note 203 and accompanying text.

[804] *See supra* section III.B for further discussion.

[805] *See* proposed Rule 600(b)(19).

[806] *See supra* note 486 for further discussion of this estimate.

[807] Commenters have suggested various ways to expand or modify the definition of covered order, including broadening its scope to capture

First, the proposed amendment expanding the definition of ''covered orders'' to include NMLOs submitted outside of regular trading hours that become executable during regular trading hours [808] would lead to a more complete picture of reporting entities' execution characteristics.[809] While an analysis using CAT data shows that pre-open/post-close orders that are executable during regular hours are likely only a small portion of total order flow, these orders have a higher concentration of individual investor shares (29.5%) than the sample time window during regular trading hours (1.9%).[810] Therefore, including information about the execution quality of these orders would be very relevant for individual investors, who would be able to make more informed decisions when choosing a broker-dealer if these orders are included in broker-dealers' execution quality disclosures. Likewise, broker-dealers would be able to make more informed decisions about where to route NMLOs submitted outside of regular trading hours, knowing that these orders are being factored into a market center's overall statistics.

Second, the proposed amendment removing the exclusion of orders with stop prices from the definition of ''covered orders'' [811] would increase transparency about the execution quality of this type of order.[812] This would be particularly beneficial for this order type, as the handling of stop orders can vary significantly across broker-dealers and across the market centers to which they route.[813] Furthermore, the execution prices of stop orders are highly sensitive to handling and execution practices, as these orders are more likely to execute when the stock price is in decline and any delay in execution will result in a larger loss (or smaller gain) for the investor. This risk is particularly acute for stop orders that use market orders, as the execution price an investor receives for this market order can deviate significantly from the stop price in a fast-moving market where prices change rapidly.[814] As shown in Table 4, stop orders that trigger the submission of market orders are the most common type of stop orders used by individual investors (representing 87.7% of their stop orders), who are more likely than institutional investors to submit stop orders (*i.e.,* 6.44% of individual investors' market orders are submitted with stop prices vs. 0.23% of those of institutional investors). Therefore, information about the execution quality of stop orders would be particularly useful for individual investors, who could use this information to identify and direct stop orders to those broker-dealers with the practices and abilities that allow them to achieve higher execution quality for these orders. As broker-dealers would be incentivized to improve their handling of stop orders,[815] they would be able to use information about the execution quality of stop orders achieved by market centers to route stop orders to those market centers with the practices and abilities that allow them to achieve higher execution quality for these orders.[816] Furthermore, the proposed amendment to include stop orders as a separate order type category rather than grouping them together with other order types [817] also would prevent them from skewing the execution quality of other orders downwards, given that stop orders are more likely to execute in adverse market conditions.

Lastly, the proposal to clarify that non-exempt short sale orders should be included in Rule 605 statistics [818] would lead to a more complete picture of reporting entities' execution characteristics, as short sales make up a large portion of trades and by implication are likely also a significant component of order flow.[819] An analysis of short volume data found that, between August 2009 and February 2021, short selling was an average of 47.3% of trading volume for non-financial common stocks.[820] To the extent that the proportion of short selling trade volume is comparable to the proportion of short selling order volume, these data points show that short selling is prevalent in equity markets. Therefore, the inclusion of non-exempt short sale orders would result in reporting entities' execution quality statistics reflecting more relevant orders for individual and institutional investors, who both engage in short selling. While the costs to maintain margin accounts and borrow stocks may prevent some individual investors from participating in the short sale market, one academic working paper found that, between January 2010 and December 2016, 6.36% of all off-exchange short selling [821] could be attributed to retail traders, and 10.92% of retail trading was made up of short sales.[822] Meanwhile, evidence suggests

additional order types. *See supra* notes 122–125 and accompanying text.

[808] *See* proposed Rule 600(b)(30). *See also supra* note 230 and accompanying text.

[809] One commenter to the 2018 Rule 2016 Amendments and petitioner for rulemaking recommending inclusion of orders submitted prior to market open in Rule 605 reporting requirements. *See supra* notes 123–125.

[810] *See* analysis described in *supra* Section VII.C.2.(b)(4).

[811] *See* proposed Rule 600(b)(30) (eliminating the express carve out of orders submitted with stop prices from the definition of ''covered order''). *See also supra* note 243 and accompanying text.

[812] A petitioner stated that including stop orders within the Rule's scope would provide a more complete view of the orders certain broker-dealers may use when assessing the execution quality market centers provide. *See supra* note 123 and accompanying text.

[813] *See supra* note 652 and accompanying text for a discussion of differential treatment of stop orders.

[814] *See, e.g., SEC Investor Bulletin: Stop, Stop-Limit, and Trailing Stop Orders,* (July 13, 2017), *available at https://www.sec.gov/oiea/investor-alerts-bulletins/ib_stoporders.html.* This risk can be attenuated with the use of stop limit orders, which sets a minimum price at which the stop order can be executed. However, the limit price may prevent the stop limit order from executing if the stock price falls below the limit price before the stop limit order can execute.

[815] *See infra* section VII.D.1.(b)(1)(*a*) for a discussion of the proposed amendments' impact on competition between broker-dealers on the basis of execution quality for stop orders.

[816] As discussed in *supra* section VII.C.2.(b)(2), the Commission understands that the handling of stop orders can vary significantly across market centers.

[817] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include a category for ''*executable* orders submitted with stop prices'') (emphasis added). *See also* discussion in *supra* section IV.B.2.(a).

[818] *See supra* note 254 and accompanying text.

[819] *See also supra* note 123 and accompanying text (petitioner recommending inclusion of short sales in Rule 605).

[820] Short volume data is provided by CBOE Group (CBOE BYX Exchange, CBOE BZX Exchange, CBOE EDGA Exchange, CBOE EDGX Exchange), FINRA (FNYX,FNSQ, FNQC), NASDAQ Group (Nasdaq BX, Nasdaq PSX and Nasdaq Stock Market), and NYSE Group (New York Stock Exchange, NYSE Arca, NYSE American, NYSE Chicago, and NYSE National). *See https://www.cboe.com/us/equities/market_statistics/short_sale/* (CBOE data); *https://www.finra.org/finra-data/browse-catalog/short-sale-volume-data* (FINRA data); *https://nasdaqtrader.com/Trader.aspx?id=shortsale* (NASDAQ data); *ftp://ftp.nyxdata.com/* (NYSE data). Common stocks include those with a CRSP share code of 10 or 11. Financial stocks (SIC code 6000–6999) and stocks that do not have an active trading status in CRSP (trade status = A) are excluded. Analysis derived based on data from CRSP 1925 US Stock Database, Ctr. Rsch. Sec. Prices, U. Chi. Booth Sch. Bus. (2022). The daily level of short selling is calculated for each stock as the daily number of shares sold short divided by the daily trading volume, averaged across stocks, and finally averaged across all days in the sample (August 3, 2009 to February 5, 2021). Note that this number matches that of other studies. For example, Figure F.1 in the Congressional Study on Short Sale Reporting shows that the level of short selling as a percentage of trading volume grew from 2007 to close to 50% by 2013. *See* Short Sale Position and Transaction Reporting (June 5, 2014), *available at https://www.sec.gov/files/short-sale-position-and-transaction-reporting%2C0.pdf.*

[821] One academic paper found that short selling by individual investors made up a much smaller percentage of overall shorting volume on NYSE (1% to 2%). The authors attribute the low number of on-exchange retail shorting to brokerage routing decisions. *See* Ekkehart Boehmer, Charles M. Jones & Xiaoyan Zhang, *Which Shorts are Informed?,* 63 J. Fin. 491 (2008).

[822] *See* Ekkehart Boehmer & Wanshan Song, *Smart Retail Traders, Short Sellers, and Stock*

Continued

that short selling by institutional investors is largely the purview of hedge funds,[823] which are estimated to make up around 85% of the short selling market.[824] One academic paper finds that short sellers' choice of trading venue is highly dependent on its market design and that, due to their information advantages, short sellers prefer trading venues that offer high execution speeds over those that offer low trading costs.[825] Therefore, including information about the execution quality that reporting entities achieve for short sale orders into Rule 605 disclosures would be relevant for a variety of investors who engage in short selling.

(b) Modernizing the Required Information

(i) Categorization by Order Size

The proposed amendments modernizing the information required by Rule 605 would promote increased transparency by increasing the relevance of the information contained in Rule 605 reports, including information about order size categories.[826]

The proposed amendments expanding Rule 605's order size categories to include information about a wider range of order sizes,[827] including odd-lots, orders less than one share, and larger-sized orders,[828] would increase the extent to which Rule 605 captures information about orders that are relevant to both individual and institutional investors. Analyses showed that the inclusion of orders for less than 100 shares into Rule 605 reporting requirements would include up to an additional 18.2% of NMLOs (2.8% of NMLO share volume),[829] and the inclusion of fractional shares would include up to an additional 10.4% of executions received by individual investors into Rule 605 reports.[830] Fractional shares would benefit from increased transparency. While the Commission lacks information on the execution quality of fractional shares, the execution quality of orders for less than one share may vary across broker-dealers. In particular, many market centers do not offer the functionality to accept or execute such orders, and so their execution quality will depend on how the broker-dealer handles these orders, such as internalizing such orders or aggregating them together for the purpose of rerouting to market centers.[831] Lastly, the inclusion of information about larger-sized orders would include up to an additional 7.8% of NMLO share volume,[832] which would likely mostly be relevant for institutional investors, to the extent that some of these orders may not be split into smaller child orders.[833]

In addition, the proposed amendments to define order size categories in terms of number of round lots[834] would increase the transparency regarding distribution of order sizes that a reporting entity handles, particularly for higher-priced stocks. The new MDI Rules tie the definition of round lot to a stock's average closing price during the previous month, with higher-priced stocks associated with lower-sized rounds lots,[835] to account for the fact that order sizes will tend to be smaller in higher-priced stocks. Continuing the example from section VII.C.2.(c)(1), under the new MDI Rules, a $500 stock would have a round lot size of 40 shares. Therefore, for a $500 stock, instead of all typically-sized orders below $200,000[836] (*i.e.,* 400 shares, or 10 round lots) being clustered in a single order size category, these orders would potentially be spread among four out of six of the proposed order size categories: (i) less than a share; (ii) odd-lot; (iii) 1 round lot to less than 5 round lots; (iv) 5 round lots to less than 20 round lots. This would result in a more meaningful categorization of orders that would better enable market participants to compare execution qualities across orders of different sizes. As a result, market participants would be better able to take into account potential differences in the distribution of order sizes that reporting entities typically handle for a given stock when comparing execution quality metrics across reporting entities, making these metrics more informative for making apples-to-apples comparisons of execution quality across reporting entities.

(ii) Categorization by Order Type

The proposed amendments modifying the order type categories required by Rule 605, including modifications to the coverage of NMLOs, and including separate order type categories for beyond-the-midpoint orders and marketable IOCs, would promote increased transparency by increasing the relevance of the information contained in Rule 605 reports.

First, the proposed amendment to modify Rule 605's coverage of NMLOs so that reporting entities are required to disclosure execution quality information only for those NMLOs that become executable[837] (*i.e.,* eventually touch the NBBO) would facilitate comparisons between market centers, by more accurately excluding NMLOs that do not receive a meaningful opportunity to execute; for example because the price moved away from the order and/or the order was cancelled before its limit price was reached.[838] On the other

Returns. Short Sellers, and Stock Returns (working paper Oct. 23, 2020) *available athttps://papers.ssrn.com/sol3/papers.cfm?abstract_id=3723096* (retrieved from SSRN Elsevier database).

[823] *See* Peter Molk & Frank Partnoy, *Institutional Investors as Short Sellers?,* 99 B.U. L. Rev. 837, 839 (2019). Molk and Partnoy's paper ''identif[ies] the regulatory and other barriers that keep key categories of institutions[, specifically, mutual funds, insurance companies, banks, sovereign wealth funds, endowments, and foundations,] from acquiring significant short positions.'' *Id.* at 843. In addition, a Division of Economic and Risk Analysis White Paper survey of all mutual fund Form N–SAR filings in 2014 found that ''[w]hile 64% of all funds were allowed to engage in short selling, only 5% of all funds actually did so.'' *See* Daniel Deli et al., *Use Of Derivatives By Registered Investment Companies,* SEC 8 (2015), *available at https://www.sec.gov/files/derivatives12-2015.pdf.*

[824] *See* Yawen Jiao, Massimo Massa & Hong Zhang, *Short Selling Meets Hedge Fund 13F: An Anatomy of Informed Demand,* 122 J. Fin. Econ. 544 (2016), citing a 2009 report from Goldman Sachs.

[825] *See* Adam V. Reed, Mehrdad Samadi & Jonathan Sokobin, *Shorting in Broad Daylight: Short Sales and Venue Choice,* 55 J. Fin. Quantitative Analysis 2246 (Nov. 2020).

[826] The EMSAC and commenters have also suggested bringing smaller and larger order sizes within scope. *See supra* notes 126–132 and accompanying text.

[827] Commenters have suggested amending the scope of the Rule to include odd-lot orders (*see supra* note 271 and accompanying text), as well as larger-sized orders (*see supra* notes 283–285 and accompanying text).

[828] *See* proposed Rule 600(b)(20). Furthermore, *see supra* section IV.B.1.(b)(2) for a discussion of the Commission's proposal to rescind the exemptive relief for orders of 10,000 or more shares and include these orders within the scope of Rule 605 reports.

[829] *See* Figure 5 in *supra* section VII.C.2.(b)(1)(*a*). As discussed in this section, odd-lots are submitted by both individual and institutional investors.

[830] *See* analysis in *supra* section VII.C.2.(b)(1)(*b*).

[831] *See supra* note 643 and accompanying text.

[832] *See* analysis in *supra* section VII.C.2.(b)(1)(*c*).

[833] This effect on competition may be limited if most large institutional orders are not held orders and would thus be excluded from Rule 605 reporting requirements, and/or are broken up into smaller child orders that are likely to be smaller and may already be included in Rule 605 reporting requirement. *See supra* note 650 and accompanying text.

[834] *See* proposed Rule 600(b)(19).

[835] *See supra* note 577 and accompanying text describing the new definition of round lots.

[836] This refers to the exclusion of orders greater than $200,000 from some Regulation NMS rules. *See supra* note 674.

[837] *See* proposed Rule 600(b)(42) (defining ''executable'') and proposed Rule 600(b)(20) (defining ''categorized by order type'' to include categories for ''*executable* orders submitted with stop prices'' and ''*executable* non-marketable limit orders'') (emphasis added). *See also supra* notes 240–241 and 303–304.

[838] *See supra* notes 296–297 and accompanying text for discussion of commenters' suggestions regarding Rule 605 reporting requirements for NMLOs.

hand, investors could expect a NMLO with a limit price equal to the prevailing NBBO to have a reasonable chance of executing, even if the limit price is more than $.10 away from the NBB or NBO at the time of order receipt. This would facilitate comparisons between market centers by ensuring that the execution quality statistics for NMLOs more meaningfully capture a market center's performance in handling NMLOs, rather than reflecting market conditions potentially outside of the market center's control, such as movements of the NBBO.

This is evident from an analysis comparing the fill rates of all near-the-quote and away-from-the-quote NMLOs to the fill rates of executable NMLOs, calculated using the sample of MIDAS data.[839] Results are presented in Figure 15.[840] While the fill rates of all near-the-quote and away-from-the-quote NMLOs are very low and similar to one another (0.2% and 0.6%, respectively), the fill rates of executable near-the-quote and away-from-the-quote NMLOs are much higher, and also very different from one another. In fact, at 32.9%, the average fill rate of executable away-from-the-quote NMLOs is relatively high, and actually much higher than the average fill rate of executable near-the-quote orders (5.5%).[841] This reflects that even away-from-the-quote orders are likely to execute if prices move such that they have a meaningful opportunity to execute.

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Figure 15: Fill Rates of Executable Away-From-the-Quote and Near-the-Quote NMLOs, March 2022

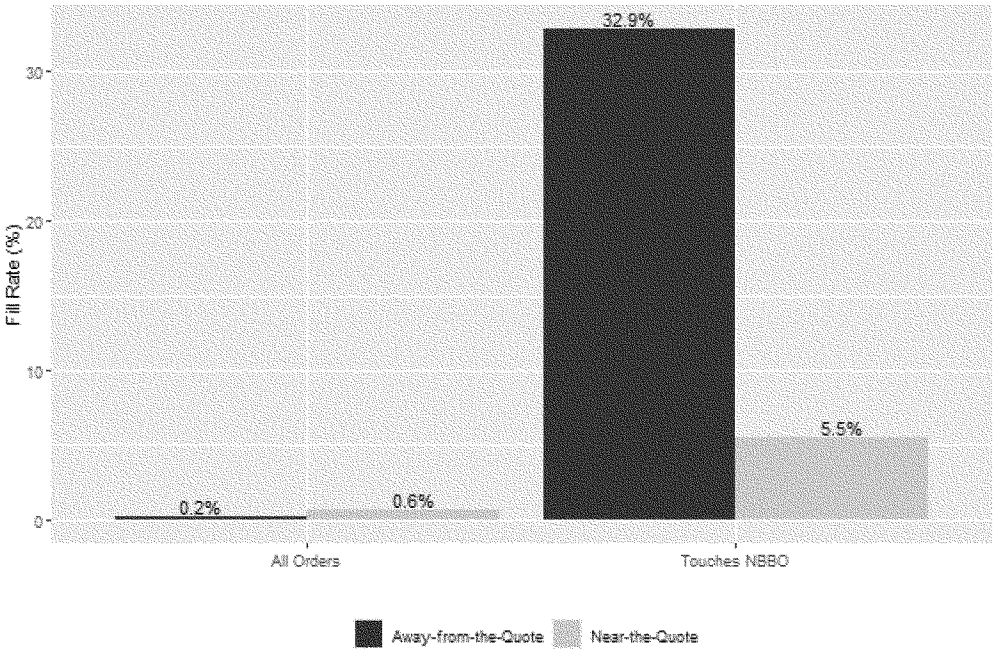

Figure 15: Fill Rates of Executable Away-from-the-Quote and Near-the-Quote NMLOs, March 2022. This figure plots the fill rates of away-from-the-quote and near-the-quote NMLOs, using order submission data from MIDAS. See supra note 634 for a description of the dataset. Fill rates are calculated as the number of shares executed divided by the number of shares submitted. Plotted are the fill rates for all away-from-the-quote and near-the-quote NMLOs, along with only those away-from-the-quote and near-the-quote NMLOs that eventually touch the NBBO (i.e., become executable). This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. See supra note 685 and section VII.C.1.d).

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Second, the proposed amendment to include a separate order type category for beyond-the-midpoint limit orders[842] would increase transparency on how reporting entities handle these types of orders (*e.g.,* whether or not they offer these orders price improvement) and reduce the extent to which including information about these orders along with other types of NMLOs may skew the execution quality statistics of other types of NMLOs. The Commission understands that different reporting entities may treat beyond-the-midpoint

[839] *See supra* note 634 for a description of the dataset. Staff found that, first, only a small percentage of NMLOs eventually touch the NBBO: only 15.01% of near-the-quote NMLOs and 2.08% of away-from-the-quote NMLOs were executable during their lifespan.

[840] This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. However, it is not clear how a change in the distribution of orders into various NMLO categories would affect the average fill rates of these NMLO categories. *See supra* note 685 and section VII.C.1.(d)(2). Also, note that, by definition, all at-the-quote and inside-the-quote NMLOs are executable by definition of having a limit price equal to or better than the NBBO, and so the fill rates of executable at-the-quote and inside-the-quote NMLOs would be identical to those for all at-the-quote and inside-the-quote NMLOs presented in Figure 8.

[841] This is likely because many near-the-quote NMLOs are cancelled before their limit prices are reached. In fact, examining the distribution of cancellations of these orders reveals that 27.5% of near-the-quote NMLO shares are cancelled within 100 milliseconds, vs. only 13.5% of away-from-the-quote NMLOs.

[842] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include a category for ''beyond-the-midpoint limit orders''). *See also supra* note 312 and accompanying text.

NMLOs differently from other types of NMLOs, and that as a result beyond-the-midpoint NMLOs have systematically different execution quality characteristics than other types of NMLOs, and even other types of inside-the-quote NMLOs. For example, beyond-the-midpoint limit orders may be offered price improvement at some market centers, such as wholesalers, so the execution quality of these orders would be highly dependent on to which type of market center the broker-dealer routes such orders.[843] Requiring reporting entities to report execution quality statistics separately for beyond-the-midpoint orders would reveal differences in reporting entities' handling of this type of order.

Lastly, the proposed amendment assigning marketable IOCs to a separate order type category so that they no longer would be commingled with other order types[844] would increase the transparency of execution quality information, both for IOCs and for other types of marketable orders.[845] Assigning marketable IOCs to a separate order type category would increase transparency about the execution quality that reporting entities achieve for these types of orders. Supporting the idea that IOCs tend to have different execution quality profiles than other types of marketable orders, an analysis showed that IOCs on average have much lower fill rates (3.22%) than other market and marketable limit orders (15.94%), and that fill rates vary across market centers and according to order characteristics such as size.[846] Information about the execution quality of IOCs would allow broker-dealers handling these types of orders to be able to better assess which market center on average offers better execution quality to these types of orders. These broker-dealers could thus make more informed decisions about where to route these orders. Furthermore, due to their different execution profiles, removing IOCs from other marketable order categories would cause the execution quality metrics for other types of marketable orders to more accurately reflect reporting entities' handling of other types of market orders.[847] The effect on the execution quality metrics of other types of marketable orders would likely be significant, as an analysis of IOCs found that they make up more than 90% of market and marketable share volume.[848]

(iii) Timestamp Conventions

Several of the proposed amendments would promote increased transparency by modifying the conventions used to calculate time-to-execution information for the purposes of Rule 605 reporting, including increasing the granularity of the timestamp, replacing the current time-to-execution buckets in Rule 605 with statistics capturing information about the distribution of time-to-execution, and modifying the conventions for recording the time-to-execution of NMLOs.[849]

First, the proposed amendment increasing the granularity of the timestamp conventions used for the time of order receipt and time of order execution from seconds to milliseconds[850] would make the current time-to-execution statistics in Rule 605, including the average share-weighted time-to-execution of shares executed with positive price improvement, without price improvement and also with negative price improvement, more informative about the execution speeds offered by a market center. Given the data and trading speeds enabled by modern technology in which execution speeds measured in seconds are likely to miss much of the variation in time-to-executions across reporting entities in today's markets, particularly for market and marketable orders,[851] adding granularity to the timestamps used to calculate the time-to-execution speed measures included in Rule 605 reports would benefit market participants in their efforts to compare time-to-executions across reporting entities.

Second, the proposal to eliminate the current time-to-execution buckets[852] would eliminate a method for presenting information about time-to-executions that has lost relevance over time, as, for reasons described above, these categories are not granular enough with respect to variations in time-to-executions across reporting entities. Instead, the Commission proposes requiring, in addition to average time to execution statistics as currently included in Rule 605,[853] both share-weighted median and 99th percentile time-to-execution statistics in order to provide information about the distribution of execution speeds achieved by a reporting entity.[854] Given that outliers could skew the share-weighted average time to execution, information about the distribution of execution speeds in addition to the average would still be useful. However, time-to-execution buckets are of limited utility, especially since time-to-execution buckets that are appropriate for some order types, such as NMLOs, may not be granular enough for other order types, such as market and marketable orders.[855] Statistics capturing the distribution of time-to-executions would represent a more flexible and useful method for capturing information about the time-to-executions of a variety of order types.

Finally, the proposed amendments would measure time-to-execution for NMLOs from the time that the order becomes executable, rather than from the time of order receipt.[856] This would ensure that this metric would be more likely to capture the portions of execution speed that are within a

[843] *See* Table 5 in *supra* section VII.C.5.(c), showing that beyond-the-midpoint orders handled by wholesalers tend to have higher fill rates, faster execution time, and higher price improvement relative to other types of NMLOs.

[844] *See* proposed Rule 600(b)(20) (defining ''categorized by order type'' to include a category for ''marketable immediate-or-cancel orders''). *See also* discussion in *supra* section IV.B.2.(c).

[845] The EMSAC, as well as commenters on the 2010 Equity Market Structure Concept Release and the 2018 Rule 606 Amendments, suggested separating IOCs within the categorization by order type. *See supra* note 324 and accompanying text.

[846] For example, market centers other than wholesalers tend to have higher fill rates for IOC odd-lots (39.6%) than non-IOC odd-lots (15.4%), the opposite is true for wholesalers (30.1% vs. 67.1%). *See* Table 6 in *supra* section VII.C.5.(g).

[847] *See supra* note 725 and accompanying text for an example of how co-mingling IOCs with other order types could lower marker centers' incentives to improve execution quality for other marketable orders.

[848] *See* Table 6 in *supra* section VII.C.5.(g) and corresponding discussion.

[849] *See supra* notes 339–340, 358 and accompanying text discussing suggestions from commenters related to the current provisions in Rule 605 for timestamps.

[850] *See* proposed Rule 600(b)(108) and (109). *See also supra* notes 333–334 and accompanying text.

[851] *See supra* section VII.C.2.(c)(4) for a discussion of how the granularity of the time-to-execution categories currently defined in Rule 605 has lost relevance over time.

[852] *See* 17 CFR 242.605(a)(1)(i)(F), (G), (H), (I) and (J) (detailing time-to-execution buckets of 0–9 seconds, 10 to 29 seconds, 30 to 59 seconds, 60 to 299 seconds and 5 to 30 minutes after the time of order receipt).

[853] *See* 17 CFR 242.605(a)(1)(ii)(D), (F), and (I), requiring share-weighted average period from the time of order receipt to the time of order execution for shares executed with price improvement, at the quote, and outside the quote, respectively.

[854] *See* proposed Rule 605(a)(1)(ii)(D), (E), (H), (I), (M), and (N), and proposed Rule 605(a)(1)(iii)(D) and (E), requiring share-weighted median and share-weighted 99th percentile time to execution information. *See also supra* note 349 and accompanying text.

[855] *See* Figure 12 and corresponding discussion in section VII.C.2.(c)(4), *supra,* describing an analysis showing that, for at-the-quote and near-the-quote limit orders, executions are reasonably well distributed across the different time-to-execution buckets but, for market and marketable limit orders, time-to-executions are mostly bunched up at the faster end of their time buckets.

[856] *See* proposed Rule 605(a)(1)(iii)(C), (D), and (E).

reporting entity's control, rather than dependent on market conditions.[857]

(iv) Modifications to Information Required for All Types of Orders

The proposed amendments modernizing the information required for all order types would promote increased transparency by increasing the relevance of the information contained in Rule 605 reports. This holds as well for the proposed amendments modifying the calculations of average realized spreads, expanding existing requirements to report average effective spreads, adding additional metrics such as percentage realized and effective spreads, effective over quoted spreads, and size improvement, and modifying the categorization of riskless principal trades.

First, the proposed amendment to modify the time horizon used to calculate the realized spread from a single horizon of five minutes to two horizons of 15 seconds and 1 minute[858] would increase the relevance of this measure and allow it to more accurately reflect the speed of modern markets.[859] This would allow market participants to better compare execution quality across market centers. Realized spreads are meant to capture information about the adverse selection risk associated with providing liquidity,[860] and in this way are a useful measure for evaluating reporting entities' order handling practices during times of market stress or high adverse selection. However, the current requirement to use a five-minute time horizon to calculate realized spreads for the purposes of Rule 605 disclosures is too long of a horizon to reflect the speed of modern markets, and likely results in noisy measures of the realized spread.[861] Instead, the proposed time horizons of 15 seconds and 1 minute are more appropriate time horizons given current trading speeds. Analysis found that the proposed time horizons of 15 seconds and 1 minute capture most of the information about realized spreads, in particular for the largest stocks.[862] This supports results from the academic literature, as one paper similarly posits that the five-minute time horizon should be replaced with a horizon of no more than 15 seconds for large stocks and 60 seconds for small stocks.[863]

Second, the proposed amendment to require market centers to include information about average effective spreads for NMLOs and orders submitted with stop prices,[864] in addition to market and marketable limit orders, would increase transparency about the availability of favorable executions for these types of orders. For NMLOs, the average effective spread captures how much customers can expect to be compensated for providing liquidity.[865] If a market center is offering lower (or, more precisely, more negative) effective spreads for NMLOs on average, that means that the market center is able to execute NMLOs even when the NBBO spread is wide, *e.g.,* because it is able to attract trading interest even during potentially adverse market conditions.[866] This can represent profitable trading opportunities for providers of limit orders, who would otherwise need to raise (in case of a buy limit order) or lower (in case of a sell limit order) their limit prices in order to attract a counterparty. Therefore, information about effective spreads for NMLOs would allow providers of limit orders (and their broker-dealers) to make comparisons across market centers based on the profitability of their limit order strategies. For orders submitted with stop prices, the average effective spread would reflect similar information to the extent that these are NMLOs. For marketable orders submitted with stop prices,[867] the average effective spread would capture information about how much more than the stock's estimated value a trader has to pay for the immediate execution of their order, similarly to how the effective spread currently included in Rule 605 for market and marketable limit orders can be interpreted.

The proposed amendments would require the average effective spread of a NMLO or an order submitted with a stop price to be calculated using the midpoint as of the time of the order's executability, rather than the time of order execution.[868] Providing the average effective spread would allow market participants to measure what liquidity providers expect to earn, which is more informative about expectations of the reporting entities' skill at handling and/or executing orders as compared to a measurement of what liquidity providers actually earn, which can be impacted by market conditions outside of a reporting entities' control.[869]

Third, the proposed amendment requiring reporting entities to report average effective spreads and average realized spreads in percentage terms,[870] in addition to the current requirement to report them in dollar terms,[871] would allow market participants to evaluate and compare the actual per-share dollar premium paid (or amount earned) captured by the spread, and use average percentage measures to compare aggregate spreads across broker-dealers that handle different mixes of stocks and/or stocks with significant price volatility. Since average spread measures represent a per-share cost, the real costs to (or premiums earned by) investors captured by average spread measures can be very different, depending on the stock price.[872] Percentage average spread measures, on the other hand, would better account for these differences in stock prices.[873] As different reporting entities handle and/or transact in different mixes of stocks with varying prices, including information about average percentage spreads would make it possible for market participants who may want to compare reporting entities' overall spread measures or their spread measures for baskets of stocks to aggregate average spreads for a variety of

[857] *See supra* note 513 for an example of how market conditions can influence the time-to-execution of NMLOs.

[858] *See* proposed Rule 605(a)(1)(i)(G) and(I). *See also supra* note 375 and accompanying text.

[859] *See supra* note 377 discussing commenters' suggestions regarding to Rule 605's provisions related to the realized spread.

[860] *See supra* note 701 and accompanying text for a discussion about what the realized spread is intended to measure.

[861] *See* discussion in *supra* section VII.C.2.(c)(5).

[862] *See* discussion of analyses in *supra* section IV.B.4.(a).

[863] *See* Conrad and Wahal.

[864] *See* proposed Rule 600(b)(10). *See also supra* note 386 and accompanying text.

[865] *See supra* note 709 and accompanying text for more details about interpreting effective spreads for NMLOs.

[866] Note that the ability of market centers to execute NMLOs at a wide spread is limited by the prohibited of trade-throughs of protected quotes under Rule 611 of Regulation NMS.

[867] *See supra* Table 4 for a break-down of orders submitted with stop prices according to order type.

[868] *See* proposed Rule 600(b)(10). The time an order becomes executable would be used for NMLOs, beyond-the-midpoint limit orders, and orders submitted with stop prices.

[869] Market participants can use the realized spread to estimate what limit order providers actually earn from liquidity provision. *See supra* note 709.

[870] *See* proposed Rule 605(a)(1)(i)(H), (J), and (L).

[871] *See* 17 CFR 242.605(a)(1)(i)(K) and 17 CFR 242.605(a)(1)(ii)(A).

[872] *See supra* note 712 and accompanying text for an example showing that the total cost of accumulating the same position in terms of dollar value in two stocks with the same per-share dollar effective spread can differ significantly in terms of total transaction costs if one stock is priced much lower than the other.

[873] *See* example in *supra* note 712. While the $250 stock and the $2.50 stock would have the same average effective spread, the average percentage effective spreads of these stocks would be 0.004% and 0.4%, respectively, which indicates that investors would face higher costs from accumulating a position in the $2.50 stock than they would from accumulating an equal-value position in the $250 stock.

stocks with varying prices.[874] This would facilitate a more apples-to-apples comparison of both average effective and average realized spreads across reporting entities.

Fourth, the proposed amendment requiring reporting entities to include information on effective over quoted spreads [875] would increase market participants' access to information about price improvement. The Commission understands that the effective over quoted spread (E/Q) is a measure often used in industry practice.[876] As such, it represents a measure of price improvement that is likely to be easily understood and interpreted by market participants. While E/Q can already be calculated from data currently available in Rule 605 reports,[877] extrapolating an average monthly quoted spread and using that to calculate an average monthly E/Q produces a noisier E/Q measure than an average E/Q calculated on a per transaction basis.[878] Therefore, including this measure would improve upon the accessibility of price improvement information contained in Rule 605 reports by making more readily available a measure that is already used and well understood by industry participants.

Fifth, the proposed amendment expanding Rule 605 reporting requirements to include a measure of size improvement would provide market participants with more information about an additional dimension of execution quality that is currently not fully captured by Rule 605 statistics.[879] The proposed amendment would require reporting entities to report, for executions of covered shares, a benchmark metric calculated as the consolidated reference quote size, capped at the size of the order,[880] which a market participant could compare to the market center's reported number of shares executed at or better than the quote.[881] This would reflect the market center's ability to offer size improvement, which would be particularly beneficial for larger-sized orders, as these orders are the most likely to exceed the liquidity available at the best quotes and therefore benefit the most from size improvement.

If information about size improvement is already captured by current Rule 605 statistics, the addition of the above-described benchmark metric capturing size improvement would not necessarily represent a benefit to transparency. To examine the extent to which a size improvement measure calculated using this benchmark metric would contain information that is different from measures currently required by Rule 605, data from the Tick Size Pilot B.II Market and Marketable Limit Order dataset [882] was analyzed to calculate the average correlation [883] between price improvement, effective spreads, and the size improvement share count divided by the benchmark share count (''size enhancement rate'').[884] As national securities exchanges and off-exchange market centers differ in the extent to which they can offer size and price improvement, staff performed this analysis separately for these two different types of market centers.

Results are presented in Table 8 and show that, for both national securities exchanges and off-exchange market centers, effective spreads are modestly (negatively) correlated with price improvement, confirming that effective spreads contain some of the same information as price improvement measures. Likewise, at least for national securities exchanges, effective spreads are modestly (negatively) correlated with the size enhancement rate, confirming that effective spreads contain some information about size improvement. However, this correlation is nearly zero for off-exchange market centers, implying that effective spreads are a poor measure of size improvement

[874] While the main purpose of Rule 605 is to facilitate comparisons across reporting entities on the basis of execution quality within a particular security, the Commission understands that access to aggregated information is useful for market participants. The proposed amendment to require reporting entities to prepare summary reports that aggregate execution quality information for S&P 500 stocks, along with all NMS stocks, would give market participants access to aggregate effective spreads for one commonly used basket of stocks. Meanwhile, per-stock percentage spread information would enhance market participant's ability to aggregate effective spread information across baskets of stocks other than the S&P 500.

[875] *See* proposed Rule 605(a)(1)(i)(M). *See also supra* note 401 and accompanying text.

[876] *See, e.g., About Us: Brokerage Built for You,* Vanguard, *available at https://investor.vanguard.com/about-us/brokerage-order-execution-quality.*

[877] *See supra* note 399.

[878] To see this, consider a market center that, in a given month, executes two orders of sizes s_1 and s_2, with effective spreads E_1 and E_2 and quoted spreads Q_1 and Q_2. The true share-weighted average E/Q would be $[s_1/(s_1 + s_2) \times (E_1/Q_1)] + [s_2/(s_1 + s_2) \times (E_2/Q_2)]$. On the other hand, approximating the average E/Q from share-weighted average effective and quoted spreads would yield $[s_1/(s_{1\ Q1} + s_{2\ Q2}) \times E_1] + [s_2/(s_{1\ Q1} + s_{2\ Q2}) \times E_2]$. In other words, it yields the weighted effective spread divided by a share-weighted average quoted spread, rather than a share-weighted average of the effective divided by quoted spread.

[879] Liquidity providers have expressed support for a size improvement measure (*see supra* note 405) and have made suggestions regarding measures (*see supra* notes 411–413).

[880] *See* proposed Rule 605(a)(1)(i)(F). As discussed in *supra* section IV.B.4.(e), this metric is meant to capture whether the depth available at the best market prices is sufficient to fully execute against a given order, or whether the order would need to walk the book in order to fully execute.

[881] Continuing the example from section VII.C.2.(c)(6), while the market center's Rule 605 report would reveal a price improvement metric of $0 for this order, the market center's benchmark metric would reveal a consolidated reference quote size of 100 shares, which a market participant could compare to the market center's reported number of shares executed at or better than the quote, which would reveal 200 shares.

[882] *See supra* note 723 for dataset description. The Commission limited this analysis to a randomly selected sample of 100 stocks and for the time period of March 2019. This dataset was then merged with MIDAS data to obtain the consolidated depth available at the NBBO at the time of the market and marketable limit order submissions, along with data on odd-lots and consolidated volume at prices outside of the NBBO. This analysis uses data from prior to the implementation of the MDI Rules and the specific numbers may be different following the implementation of the MDI Rules. In particular, for certain stocks, the NBBO quoted spread is expected to narrow, the liquidity available at the NBBO may decrease, and the NBBO midpoint may change, though the Commission is uncertain of the direction of this effect. This may impact statistics that are based on these values, including measures of price and size improvement and effective spreads. *See supra* section VII.C.1.(d)(2). However, it is unclear whether or how these effects would impact the correlations between these measures documented in this analysis.

[883] Correlation is calculated using the Pearson correlation coefficient, which measures the linear correlation between two sets of data, ranging from −1 to 1, with −1 representing perfect negative correlation and 1 representing perfect positive correlation. To construct a measure of average correlation, the Commission first calculated the Pearson correlation coefficient for each pair of execution quality metrics, for each market center—stock combination. Then the Commission took the value-weighted average correlation coefficient across all stocks for each market center, using dollar volume as weights. Then the Commission averaged the resulting correlation coefficients across market centers using an equal-weighted average.

[884] *See* section IV.B.4.(e) for a definition of the size improvement share count, which captures the number of shares greater than the depth available at the NBBO to which the market center was able to offer the best displayed price. The size improvement share count is divided by the proposed benchmark share count to obtain the size enhancement rate to control for differences in market conditions. For example, if Market Center A has 1,000,000 shares executed at or better than the best displayed price and a benchmark share count of 800,000, and Market Center B has 2,000,000 shares executed at or better than the best displayed price and a benchmark share count of 1,800,000, both market centers would have a size improvement share count of 200,000, but Market Center A would be offering the a higher rate of size improvement since they had fewer shares available to them at the consolidated depth (*i.e.,* a lower benchmark share count). To capture this, the size improvement share count is divided by the benchmark share count, such that Market Center A would have a size enhancement rate of 200,000/800,000 = 25% and Exchange B would have size enhancement rate of 200,000/1,800,000 = 11%. This difference recognizes that Exchange A and Exchange B provided the same number of size improved shares but Exchange A had lower consolidated depth available when it needed to execute.

particularly for these types of market centers.

TABLE 8—AVERAGE CORRELATION BETWEEN MEASURES OF PRICE AND SIZE IMPROVEMENT

Correlations	National securities exchanges (percent)	Off-exchange market centers (percent)
Price Improvement and Effective Spreads	−25.7	−20.5
Size Enhancement Rate and Effective Spreads	−12.0	0.1
Price Improvement and Size Enhancement Rate	31.3	5.9

Table 8: Average Correlation between Measures of Price and Size Improvement. This table presents correlations between three measures of price improvement and size improvement: price improvement, calculated as the signed difference between the execution price and the NBBO; the effective spread, calculated as twice the signed difference between the execution price and the NBBO midpoint; and the size enhancement rate, calculated as the size improvement share count divided by the benchmark share count (*see supra* note 884 and accompanying text for a detailed description of this measure). *See supra* note 723 for dataset description and *supra* note 883 for methodology. This analysis uses data from prior to the implementation of the MDI Rules and results may be different following the implementation of the MDI Rules. *See supra* note 882 and section VII.C.1.(d)(2).

While price improvement and the size enhancement rate are moderately correlated for national securities exchanges, implying that information from these two measures overlaps to some extent, this correlation is comparatively low for off-exchange market centers. The fact that price improvement and the size enhancement rate are not perfectly overlapping (*i.e.,* are not perfectly correlated) implies that each of these measures to some degree conveys different information about execution quality, particularly for off-exchange market centers. Therefore, including information that could be used to calculate a size improvement measure such as the size enhancement rate into Rule 605 reporting requirements would provide market participants with more information about an additional dimension of execution quality that is not fully captured by current Rule 605 statistics.

Lastly, the proposed amendment specifying that market centers should include riskless principal trades in the category of trades executed away from the market center [885] would increase transparency about internalization by wholesalers, as information on the extent to which wholesalers internalize order flow is currently obscured by the inclusion of riskless principal trades into the category of trades executed at, rather than away from, the market center.[886] Market participants would be more informed about potential differences in execution quality between wholesalers that largely internalize order flow as compared to those whose orders are subject to competition from other interested parties quoting on external market centers.

(v) Modifications to Information Required for Market, Marketable Limit, Marketable IOC, and Beyond-the-Midpoint Limit Orders

Several of the proposed amendments would modernize the information required for market, marketable limit, marketable IOC, and beyond-the-midpoint limit orders, which would promote transparency by increasing the relevance of the information contained in Rule 605 reports for these types of orders, including information about time-to-execution and price improvement.

First, the proposed amendment requiring reporting entities to report, for shares executed with price improvement, executed at the quote, or executed outside the quote, a wider range of time-to-execution statistics, including the average,[887] median,[888] and 99th percentile [889] period from the time of order receipt to the time of order execution, would increase transparency about the execution speeds offered by a reporting entity. Given that outliers could skew the share-weighted average time to execution, information about the distribution of execution speeds in addition to the average would be useful.[890] Therefore, including a variety of statistics (mean, median and 99th percentile) would help ensure that market participants have sufficient information about the distribution of time-to-execution in order to account for any outliers. This would facilitate comparisons across reporting entities on the basis of execution speeds.

Second, the proposed amendment requiring, for marketable order types (*i.e.,* market, marketable limit, marketable IOC, and beyond-the-midpoint limit orders), reporting entities to disclose price improvement statistics using the best available displayed price as the benchmark [891] would give market participants access to price improvement information relative to a benchmark price that more accurately reflects liquidity available in the market. For example, if a market center internalizes an order with $0.05 of price improvement relative to the NBBO, but odd-lots are available on another market center at prices that are $0.10 better than the NBBO, this measure would reflect a price dis-improvement of $0.05. This would indicate that the investor could have received a better price if the market center had routed the order to execute against the available odd-lot liquidity.

[885] *See* proposed Rule 605(a)(1)(i)(D). *See also supra* note 418 and accompanying text.

[886] *See supra* section VII.C.2.(c)(8) for a discussion of how classifying riskless principal trades in the category of executions taking place at the market center may obscure the extent to which wholesalers internalize order flow.

[887] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, see proposed Rules 605(a)(1)(ii)(C), 605(a)(1)(ii)(G), and 605(a)(1)(ii)(L).

[888] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, see proposed Rules 605(a)(1)(ii)(D), 605(a)(1)(ii)(H), and 605(a)(1)(ii)(M).

[889] For shares executed with price improvement, executed at the quote, or executed outside the quote, respectively, *see* proposed Rules 605(a)(1)(ii)(E), 605(a)(1)(ii)(I), and 605(a)(1)(ii)(N).

[890] Consider, for example, a reporting entity (''Reporting Entity A'') that executes one hundred equally-sized orders with a time-to-execution of 1 millisecond, but a single order at a time-to-execution of 100,000 milliseconds (100 seconds), and compare to a reporting entity (''Reporting Entity B'') that executes the same size and amount of orders all at a time-to-execution of 1,001 milliseconds. Both reporting entities' average time-to-execution statistic would be 1,001 milliseconds. However, comparing these two statistics would not reveal that Reporting Entity A nearly always offers a faster execution time than Reporting Entity B, except for a single outlier. Median time-to-execution statistics, however, would reveal that Reporting Entity A has a median time-to-execution of 1 millisecond, while Reporting Entity B has a median time-to-execution of 1,001 milliseconds, which would allow for comparison accounting for Reporting Entity A's outlier.

[891] *See* proposed Rule 600(b)(14) (defining the ''best available displayed price'') and proposed Rule 605(a)(1)(ii)(O) through (S). *See also supra* section IV.5 for further discussion of these amendments.

This would thus allow market participants (including broker-dealers) to identify those market centers that execute orders at prices better than the best available displayed price, taking into account all available displayed liquidity.[892]

(vi) Additional Required Information for Executable NMLOs, Executable Stop Orders, and Beyond-the-Midpoint Limit Orders

The proposed amendments would increase the relevance of the information contained in Rule 605 reports for executable NMLOs, executable stop orders, and beyond-the-midpoint limit orders. Specifically, the proposed amendment requiring reporting entities to report the number of shares that executed while an executable NMLO was in force[893] would promote transparency regarding differences in the execution probabilities of NMLOs between reporting entities.[894] Market participants would be able to determine if a reporting entity is unable to achieve an execution in an executable NMLO despite the fact that a large number of shares are executing at that NMLO's limit price elsewhere in the market, enabling investors and their broker-dealers to make better informed routing decisions. Furthermore, the proposed amendment requiring the reporting of the number of orders that received either a complete or partial fill would provide important additional information about the nature of a market center or broker-dealer's NMLO and stop order executions—*e.g.,* whether a high executed cumulative count represents, on average, larger execution sizes or a higher count of orders receiving executions.[895]

(3) Proposed Summary Execution Quality Reports

The proposed amendment requiring reporting entities to prepare human-readable summary reports[896] would facilitate comparisons across reporting entities on the basis of execution quality by increasing the accessibility of the information contained in Rule 605 reports.[897] The data generated under Rule 605 is complex, and the raw data may be difficult for some market participants to interpret and aggregate. Summary reports would give market participants access to standardized information that could be used to quickly compare across reporting entities. This would be particularly useful for those investors that may not have access to the resources to retrieve and process the raw data in Rule 605 reports, such as some individual investors.

However, as differences in execution quality can be driven by differences between reporting entities other than differences in their skills at handling and/or executing orders, such as differences in the characteristics of their order flow,[898] the Commission recognizes that it is important to strike a balance between sufficient aggregation of orders to produce statistics that are meaningful and sufficient differentiation of orders to facilitate fair comparisons of execution quality across reporting entities.[899] The Commission believes that the statistics required in the summary reports would strike this balance.

(b) Improvements in Execution Quality

The Commission believes that the proposed amendments would serve to improve execution quality for both individual and institutional investors, as these investors would be able to make better informed decisions about where to route their orders to achieve better quality executions. Execution quality would further improve, as the flow of orders and customers to those reporting entities offering better execution quality would promote increased competition on the basis of execution quality, both in the market for brokerage services and in the market for trading services. This would result in improvements to overall levels of execution quality, as well as improvements to particular components of execution quality, such as execution prices, execution speeds, size improvement, and fill rates.

The magnitude of the improvements in order execution quality that individual and institutional investors may experience may be lower when the MDI Rules are implemented, because the availability of faster consolidated market data with more data on odd-lot information, auction information, and depth of book information from competing consolidators could result in improved execution quality for customer orders if their broker-dealers currently utilize SIP data and switch to consuming the expanded consolidated market data. However, there is uncertainty with respect to how these benefits would change because there is uncertainty regarding how the price improvement wholesalers would provide retail investors would change as well as uncertainty regarding how the NBBO midpoint will change for stocks with prices above $250 when the MDI Rules are implemented.[900] The Commission believes that the Proposal would still lead to improvements in individual and institutional investor order execution quality, as well as improvements in price discovery, relative to a baseline in which The MDI Rules are implemented.

(1) Increased Competition on the Basis of Execution Quality

The Commission believes that the proposed amendments would have the general effect of increasing levels of execution quality, as both broker-dealers and market centers would experience increased competition on the basis of execution quality. The Commission expects that these improvements in overall levels of execution quality would likely be the result of improvements to broker-dealer routing practices and improvements to market centers' execution practices, as well as generally improvements in market participants' ability to use Rule 605 reports to compare information across reporting entities as a result of better and more accessible data.

[892] If only the NBBO is used as the benchmark for the proposed price improvement statistic relative to the best available displayed price, because, for example, odd-lots inside the NBBO are not available or because information about the best odd-lot orders available in the market inside the NBBO is not or is not yet available in consolidated market data, then these additional price improvement statistics would be the same as the price improvement statistics currently included in Rule 605 and would not have significant economic effects. *See supra* note 423.

[893] *See* proposed Rule 605(a)(1)(iii)(B). *See also supra* section IV.B.6 for further discussion of this proposed amendment.

[894] One commenter suggested a similar execution quality metric called a ''non-marketable benchmark.'' *See supra* notes 442–443 and accompanying text.

[895] For example, say that a reporting entity discloses in its Rule 605 reports that it received 100 orders sized 100 round lots or greater in a stock with a 100-share round lot, with a and that these orders had a cumulative number of shares of 1,000,000, and furthermore that it executed 990,000 of those shares. Information on the number of complete or partial fills would help to clarify whether the reporting entity, *e.g.,* executed 99 orders of 10,000 shares each, or a single order of 990,000 shares.

[896] *See* proposed Rule 605(a)(2). *See also supra* note 462 and accompanying text.

[897] In several contexts in which the Commission has received general feedback on equity market structure, commenters have suggested that the Commission require a simplified execution quality report, particularly for retail investors. *See supra* notes 135–138 and corresponding text. Commenters have also suggested that the Commission require broker-dealers to produce a summary report. *See supra* notes 451–454.

[898] *See supra* note 513 for an example of how differences in order flow characteristics may impact inferences about execution quality.

[899] *See, e.g.,* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75423.

[900] *See supra* section VII.C.1.(d)(2) for further details on how the rules adopted in Market Data Infrastructure could affect the NBBO.

(a) Improvements to Broker-Dealer Routing Practices

The Commission believes that execution quality would improve as a result of increased competition between broker-dealers on the basis of execution quality.[901] The proposed amendment expanding the scope of Rule 605 reporting entities to include larger broker-dealers would promote increased transparency regarding the execution quality achieved by broker-dealers.[902] Hence, market participants would be better able to compare execution quality information across broker-dealers. Customers could then use this information to compare across broker-dealers and select those broker-dealers offering better execution quality. The flow of customers to the broker-dealers that provide better execution quality would improve the execution quality of customers that route their orders to high-quality broker-dealers and also increase the extent to which broker-dealers rely on execution quality information when making their order routing decisions in order to compete with other broker-dealers for customer order flow.

Broker-dealers would increase their competitive position with respect to execution quality by investing in or otherwise adjusting their routing practices to increase the extent to which they route orders to the market centers offering better execution quality and limit the extent to which they route orders for other potential reasons. For example, broker-dealers that face conflicts of interest that would otherwise misalign their interests with their customers' interest in receiving the best possible execution quality would be better incentivized to manage these conflicts as a result of an increase in their need to compete on the basis of execution quality.[903] Specifically, as the gains to broker-dealers of conflicted routing practices would be more likely to be outweighed by a loss of customer order flow, because they offer lower execution quality, these broker-dealers would base more of their routing decisions on the execution quality of market centers, rather than on which market centers are more likely to benefit them (*e.g.,* because of higher PFOF or lower access fees).

The magnitude of the improvements in order routing practices may be lower when the MDI Rules are implemented, because the availability of faster consolidated market data with more data on odd-lot information, auction information, and depth of book information from competing consolidators could result in improved order routing for customer orders if their broker-dealers currently utilize SIP data and switch to consuming the expanded consolidated market data.[904] However, the Commission believes that the proposed amendments would lead to improvements in broker-dealer order routing decisions relative to a baseline in which the MDI Rules are implemented.

(b) Improvements to Market Centers' Execution Practices

The Commission believes that execution quality would improve as a result of increased competition between market centers on the basis of execution quality. As a result of the proposed amendments' effects increasing the transparency of reporting entities' execution quality, including market centers,[905] broker-dealers would be better informed about the execution quality of market centers when making their routing decisions. The flow of orders to those market centers that provide better execution quality would improve the execution quality of those broker-dealers (and their customers) that route their orders to these higher-quality market centers, and also increase the extent to which market centers must improve their execution practices in order to better compete with other market centers to attract customer order flow.

The flow of orders to market centers that provide better execution quality would be further enhanced by improvements in broker-dealer routing practices,[906] resulting from an increase in the extent to which broker-dealers [907] compete on the basis of execution quality as a result of the proposed amendments increasing the transparency of larger broker-dealers' execution quality.[908] Broker-dealers would be more likely to account for market centers' execution quality, further promoting the flow of orders to market centers offering better execution quality. The flow of orders to those market centers offering better execution quality could also result in further improvements in execution quality for their customers, as liquidity externalities and the consolidation of orders onto high-quality market centers would increase the liquidity of these venues.[909]

Additionally, the proposed amendments modifying the scope of reporting entities to specify that broker-dealers post separate Rule 605 reports for their ATSs and require that market centers operating SDPs and qualified auctions post separate reports for each market center would facilitate comparisons of execution quality across similar types of market centers, by allowing market participants to be better informed about the execution quality of each type of market center.[910] This would increase the extent to which these market centers would compete on the basis of execution quality in order to attract orders.

The magnitude of the improvements in execution practices may be lower when the MDI Rules are implemented, because the availability of faster consolidated market data with more data on odd-lot information, auctions information, and depth of book information from competing consolidators could result in more informed customer order routing by broker-dealers that switch to consuming the expanded consolidated market data, which could separately increase the flow of orders to trading venues offering better execution quality.[911] However, the Commission believes that the proposed amendments would lead to improvements in execution practices over and above the improvements that might result from the implementation of the MDI Rules.

[901] The Commission believes that these effects would principally accrue to larger broker-dealers, who would be required to prepare Rule 605 reports, but may spill over to effect smaller broker-dealers as well. *See* discussion in *infra* section VII.D.1.(d)(1).

[902] *See supra* section VII.D.1.(a)(1)(a) for a discussion of how the proposed amendment requiring larger broker-dealers to publish Rule 605 reports would promote increased transparency about the execution quality of larger broker-dealers.

[903] *See supra* section VII.C.2.(a)(1) for a discussion of potential conflicts of interest in broker-dealer routing decisions.

[904] *See supra* section VII.C.1.(d)(2) for further discussion.

[905] *See supra* section VII.D.1.(a)(2) for a discussion of how the proposed modifications to Rule 605 disclosure requirements would promote increased transparency about execution quality.

[906] *See supra* section VII.D.1.(b)(1)(*a*) for a discussion of the effects of the proposed amendments on broker-dealer routing practices.

[907] The Commission believes that these effects would principally accrue to larger broker-dealers, but may spill over to effect smaller broker-dealers as well. *See supra* note 901.

[908] *See supra* section VII.D.1.(a)(1)(*a*) for a discussion of how the proposed amendment requiring larger broker-dealers to publish Rule 605 reports would promote increased transparency about the execution quality of larger broker-dealers.

[909] However, liquidity externalities may have adverse effects on the competition between market centers if they result in the exit of some market centers. *See infra* section VII.D.1.(d)(4) for a discussion.

[910] *See supra* section VII.D.1.(a)(1) for a discussion of how the proposed amendments modifying the scope of reporting entities would promote increased transparency about execution quality.

[911] *See supra* section VII.C.1.(d)(2) for further discussion.

(c) Improvements to Information Used To Make Apples-to-Apples Comparisons of Execution Quality

The Commission believes that competition between reporting entities on the basis of execution quality would also be enhanced by the proposed amendments modernizing the information included in Rule 605 reports used to make apples-to-apples comparisons of execution quality. Some of the information required to be reported by Rule 605 does not measure execution quality directly but serves the purpose of providing context to execution quality metrics. This enables investors to make better apples-to-apples comparisons across reporting entities whose order flows consist of different mixes of securities, order sizes, and order types,[912] and to ascertain how entities may handle orders during different market conditions.[913] If market participants have access to more (and/or more relevant) information that improves their ability to compare execution quality across reporting entities, this would further promote competition between reporting entities on the basis of execution quality, resulting in improvements in execution quality for investors. Such information includes the proposed amendments expanding and modernizing order size and order type categories,[914] which permit market participants to control for potential differences in the characteristics of reporting entities' order flow, as well as the proposed amendments modifying the calculation of realized spreads,[915] which allows market participants to control for potential differences in the extent to which reporting entities handle orders during periods of adverse market conditions.

Furthermore, as market participants have access to more useful information about the execution quality of particular order types and sizes, the extent to which reporting entities would need to compete on the basis of execution quality to attract these types of orders would increase, and order flow would accumulate to the reporting entities offering the highest execution quality for these types of orders. This would in turn translate into improved execution quality for investors for these types of orders. For example, as a result of the proposed amendment expanding the order size categories to include information about odd-lots, market participants' improved access to information about a market center's offering of price improvement and timely execution of odd-lots would improve both the price and speed at which odd-lot orders are executed, which would be beneficial for both institutional and individual investors.[916]

(d) Improvements to Accessibility

The Commission believes that execution quality would also increase as a result of the proposed amendment requiring reporting entities to prepare human-readable summary reports,[917] as market participants would be better able to use information from Rule 605 reports to compare execution quality across reporting entities and competition between reporting entities on the basis of execution quality would increase as a result.[918] Specifically, individual investors, who may be less likely to have access to the resources to retrieve and process the raw data in Rule 605 reports, would be better able to access information from Rule 605 reports to compare execution quality across larger broker-dealers, which would increase the extent to which these broker-dealers would need to compete on the basis of execution quality to attract and retain these customers.

(2) Improvements to Components of Execution Quality

The Commission believes that the proposed amendments would have the effect of improving the quality of executions along specific dimensions of execution quality, including execution prices, size improvement, execution speeds, and execution probabilities (*i.e.,* fill rates), as investors (and their broker-dealers) would be better able to identify and route orders to those reporting entities that offer better quality executions in terms of a particular dimension of execution quality,[919] and as reporting entities would further compete with one another on the basis of these dimensions of execution quality.[920] The Commission believes that the proposed amendments would lead to improvements in execution quality relative to a baseline in which the MDI Rules are implemented, *i.e.,* over and above any improvements in execution quality that may result from the implementation of the MDI Rules.[921]

(a) Execution Prices

The Commission believes that the proposed amendments would improve execution quality in terms of execution prices by increasing the extent to which reporting entities seek out executions at prices better than the NBBO; *i.e.,* increasing the extent to which market centers execute order with price improvement, and/or increasing the extent to which broker-dealers route to market centers offering price improvement.

First, the proposed amendment to require information on the average percentage effective spread in addition to the average effective spread in dollar terms would facilitate more apples-to-apples comparisons of execution prices across reporting entities, permitting greater competition and resulting in lower effective spreads; *i.e.,* better execution prices.[922] Second, the proposed amendment to require information about effective spreads for NMLOs, in addition to market and marketable limit orders, would allow providers of limit orders (and their broker-dealers) to make comparisons across market centers based on the profitability of their limit order strategies, permitting greater competition and resulting in lower (*i.e.,* more negative) effective spreads for NMLOs.[923] Third, the proposed amendment to require price improvement statistics using the best available displayed price as the benchmark for market, marketable limit,

[912] *See supra* note 513 for an example of how differences in order flow characteristics may impact inferences about execution quality.

[913] *See supra* note 701 and accompanying text for a discussion of how handling order flow during adverse market conditions affects execution quality.

[914] *See supra* sections VII.D.1.(a)(2)(*b*) and VII.D.1.(a)(2)(*c*)(i)–(ii) for discussions of how the proposed amendments expanding the coverage of orders, as well as modifying the existing order type and size categories, respectively, would promote increased transparency about execution quality.

[915] *See supra* section VII.D.1.(a)(2)(*c*)(iv) for a discussion of how the proposed amendments modifying the reporting requirements for realized spreads, including expanding and modernizing the time horizon used to calculate the average realized spread, as well as including information about percentage average realized spreads, would promote increased transparency about execution quality.

[916] *See supra* section VII.C.2.(b)(1)(*a*) for a discussion of the use of odd-lots by both individual and institutional investors.

[917] *See* proposed Rule 605(a)(2). *See also supra* note 462 and accompanying text.

[918] *See supra* section VII.D.1.(a)(3) for a discussion of how the proposed amendment requiring reporting entities to prepare human-readable summary reports would result in increased transparency about execution quality.

[919] *See supra* section VII.D.1.(a) for a discussion of the benefits to the proposed amendments for increased transparency.

[920] *See supra* section VII.D.1.(b)(1) for a discussion of the impact of the proposed amendments on competition between reporting entities on the basis of execution quality.

[921] *See supra* section VII.C.1.(d)(2) for further discussion.

[922] *See supra* section VII.D.1.(a)(2)(*b*)(iv) for a discussion of the effect of the proposed amendment to include the average percentage effective spread on transparency.

[923] *See id.* for a discussion of the effect of the proposed amendment to include the average effective spread for NMLOs on transparency.

marketable IOC, and beyond-the-midpoint limit orders, would promote incentives for reporting entities to seek out or offer price improvement relative to the best displayed price, taking into account all available displayed liquidity (including odd-lots).[924] Continuing the example from section VII.C.2.(c)(6), in which a market center internalizing an order could post a positive price improvement metric even though a better-priced odd-lot was available at another market center, this would not be the case for price improvement metrics measured relative to the best displayed price. Instead, the market center may be incentivized to increase its offering of price improvement from $0.05 above the NBBO to $0.15 above the NBBO (*i.e.,* $0.05 above the best displayed price), in order to maintain the same level of price improvement in its Rule 605 report. Lastly, the proposed amendment to require reporting entities to report effective over quoted spreads would make more readily available a measure that is already often used and well understood by industry participants, and would result in improved execution prices as a result of the effects on competition.[925]

(b) Size Improvement

The proposed amendments would improve execution quality in terms of size improvement by increasing the extent to which market centers execute orders beyond the liquidity available at the NBBO; *i.e.,* execute order with size improvement, and by increasing the extent to which broker-dealers route to market centers offering size improvement. The proposed amendment would require reporting entities to report a benchmark metric calculated as the consolidated reference quote size, capped at the size of the order.[926] In order to attract broker-dealer order flow,[927] market centers would be incentivized to compete on the basis of size improvement, for example by executing orders against their own inventory at or better than the NBBO, or offering additional incentives to attract hidden liquidity priced at or better than the NBBO. Investors that particularly value the ability of reporting entities to offer size improvement, such as investors trading in larger order sizes, would be able to use this metric to discern which reporting entity might offer better size improvement to their orders, which would allow them to make better routing decisions and obtain increased size improvement as a result.[928] Competition on the basis of size improvement among reporting entities would also increase in order to attract these customers and their orders.

(c) Execution Speeds

The proposed amendments would also improve execution quality by increasing execution speeds for those investors that value fast executions.[929] The proposed amendments increasing the granularity of the timestamp conventions required by Rule 605 from seconds to milliseconds, replacing the time-to-execution categories currently defined in Rule 605 with time-to-execution statistics, and measuring time-to-execution for NMLOs from the time that the order becomes executable, rather than from the time of order receipt, would lead to improved execution times for investors, as the increased transparency around reporting entities' execution times would increase their ability to identify and route orders to reporting entities offering faster execution speeds.[930]

Investors that may prioritize fast execution times would be able to better identify the reporting entities offering better execution quality in terms of time-to-execution. Different investors benefit from faster execution times for different reasons. Individual investors often benefit from faster executions to the extent that faster executions result in better prices. For example, market orders benefit from fast execution as any delay in execution could result in worse price if prices are increasing (for buy orders) or decreasing (for sell orders). This is particularly true for market orders submitted with stop prices, which tend to be triggered during rapidly declining markets, and which an analysis finds constitute 6.44% of market orders submitted by individual investors.[931] For IOCs, a faster execution implies a faster routing time, which would reduce the chance of another order stepping in and removing liquidity before the order gets a chance to execute, thus increasing the order's probability of execution.

For institutional investors, the benefits of fast execution may be different.[932] Institutional investors, who often need to trade large positions, may care more about reducing the price impact of their order rather than executing the order quickly.[933] However, the academic literature suggests that institutional investors with short-lived private information may benefit from faster time-to-executions, as they are able to profit from trading against other, slower institutions.[934] On the same note, faster time-to-executions benefit slower institutional investors by reducing their exposure to adverse selection as much as possible.[935] Institutional investors may also care about the execution speed of their child orders.

[924] *See supra* section VII.D.1.(a)(2)(*b*)(v) for a discussion of the effect of the proposed amendments related to include information about price improvement relative to the best displayed price on transparency.

[925] *See supra* section VII.D.1.(a)(2)(*b*)(iv) for a discussion of the benefits to transparency of the proposed amendments related to include information about E/Q into Rule 605 reporting requirements.

[926] *See supra note* 720 for an example.

[927] *See supra* section VII.D.1.(b)(1)(*a*) for a discussion of how the proposed amendments would increase competition between broker-dealers on the basis of execution quality.

[928] For example, compare the example of Market Center B offering size improvement to a 200-share order in note 718, *supra,* to the example of Market Center B offering price improvement to a 100-share order in note 719, *supra.* A trader that tends to submit 200-share orders would want to know a market center's ability to offer the first scenario, while a trader that tends to submit 100-share orders would want to know the market center's ability to offer the second scenario. However, in both examples the Rule 605 report would show an effective spread statistic of $0.05 for orders in the order size category of 100–499 shares, which means that these traders would not be able to use this statistic to discern a market center's execution quality according to the dimension of execution quality that they find most valuable.

[929] *See supra* section VII.C.2.(c)(4) for a discussion of current executions speeds. The Commission expects these benefits to mainly accrue to investors that value faster executions, as these investors (and their broker-dealers) would benefit from an improved ability to compare execution speeds across trading venues and route their orders accordingly. However, to the extent that changes in order flow would result in an increase in market centers' incentives to offer faster executions, *e.g.,* by investing in faster trader technology, this could result in a market-wide increase in trading speeds for all investors.

[930] *See supra* section VII.D.1.(a)(2)(*b*)(iii) for a discussion of how these amendments to timestamp conventions would promote transparency on the basis of execution quality.

[931] *See* Table 4 in *supra* section VII.C.2.(b)(2).

[932] While institutional investors are likely to have access to alternative sources of more granular information about execution speeds, such as reports obtained through TCA, the information on execution quality that is individually collected by institutional investors is typically non-public and highly individualized, and therefore limited to the execution quality obtained from broker-dealers with which the institutional investors currently does business. Since Rule 605 reports are public, institutional investors could use these reports to assess the execution quality of the broker-dealers and market centers with which they do not currently do business. *See supra* section VII.C.1.(c)(2) for further discussion.

[933] *See supra* section VII.C.3.(a)(1)(*b*) for a discussion of the handling of institutional orders by broker-dealers as not held orders.

[934] *See, e.g.,* Ohad Kadan, Roni Michaely & Pamela C. Moulton, *Trading in the Presence of Short-Lived Private Information: Evidence from Analyst Recommendation Changes,* 53 J. Fin. Quantitative Analysis 1509 (2018).

[935] *See, e.g.,* Jonathan Brogaard, Bjorn Hagströmer, Lars Nordén & Ryan Riordan, *Trading Fast and Slow: Colocation and Liquidity,* 28 Rev. Fin. Stud. 3407 (2015).

(d) Fill Rates

The Commission believes that the proposed amendments would improve execution quality in terms of increased fill rates.[936] Specifically, the proposed amendment for reporting entities to report the number of shares that executed while an executable NMLO was in force would increase the ability of investors and their broker-dealers to route orders to those reporting entities with higher fill rates of executable NMLOs, as market participants would have access to information about the extent to which a NMLO did not execute or executed after a large number of shares executed elsewhere in the market, despite the fact that the NMLO was executable.[937] In order to attract this order flow, reporting entities would need to improve their ability to achieve executions for executable NMLOs. Market centers could achieve higher fill rates for NMLOs, for example, by reducing access fees to encourage more marketable orders to execute against resting NMLOs, or by discouraging excessive submissions and cancellations of NMLOs, for example by instituting or raising excessive messaging fees.[938] Broker-dealers could achieve higher fill rates for NMLOs by improving their order routing methods and by routing orders to market centers that achieve higher fill rates for NMLOs.

(c) Other Benefits

To the extent that the proposed amendments to Rule 605 increase incentives for reporting entities to compete in areas other than improved execution quality, customers may benefit from improvements that are not directly related to execution quality, such as lower fees, higher rebates, new products or functionalities, or better customer service. Note that improvements in other quality areas as a result of the increase in competition among reporting entities may be either complementary to or a substitute for improvements in execution quality. Investors are more likely to see an overall benefit from the proposed amendments to the extent that these improvements are complementary. Furthermore, to the extent that the proposed amendments increase competition in related markets, market participants could benefit from lower costs and/or improved quality in these markets. For example, the quality of TCA reports may improve if their publishers need to offer better products in order to complete with the publicly available data under Rule 605.

(d) Potential Limitations to Benefits

There are certain factors, however, that could limit the effects of the proposed amendments on transparency and competition, which would limit the effectiveness of the proposed amendments in improving execution quality.

(1) Effect on Smaller Broker-Dealers

The expanded scope of Rule 605 only includes larger broker-dealers. Hence, investors, as they gain transparency into the execution at these larger broker-dealers, may route more transactions to these broker-dealers at the expense of smaller broker-dealers who are not included in the scope of Rule 605. That said, smaller broker-dealers may gain a competitive advantage in the form of lower costs as a result of not having to prepare Rule 605 reports. Also, increased levels of competition between larger broker-dealers may spill over to affect smaller broker-dealers, as their customers may expect more transparency, and smaller broker-dealers would continue to be able to publish ad hoc execution quality reports that focus on execution quality metrics in which they perform well.[939] Altogether, the Commission preliminarily believes that the cumulative effects on smaller broker-dealers, who handle only a small fraction of all orders,[940] are likely to be minimal, and limiting the scope of Rule 605 to large broker-dealers should suffice for the purposes of achieving the competitive effects discussed in prior sections.[941]

It is also possible that, as a result of the proposed amendments, smaller broker-dealers that are unable,[942] or choose not, to offer the same levels of transparency as larger broker-dealers may lose customers to larger broker-dealers for which better execution quality information is available, which could cause some smaller broker-dealers to exit the market. The Commission is unable to quantify the likelihood that a brokerage firm would cease operating as a result of the proposed amendments. Even if some smaller broker-dealers were to exit, the Commission does not believe this would significantly impact competition in the market for brokerage services because the market is served by a large number of broker-dealers.[943] The Commission recognizes that smaller broker-dealers may have unique business models that are not currently offered by competitors, but the Commission believes other broker-dealers, including new entrants, could create similar business models if demand was adequate.

(2) Switching Costs

The effects of the proposed amendments on competition among reporting entities [944] may be limited if investors incur high costs to switch between broker-dealers, and/or if broker-dealers incur costs to switch between market centers in response to information about execution quality. To the extent that competition between reporting entities on the basis of execution quality is limited, this would limit the extent to which execution quality would improve as a result of the proposed amendments.[945]

[936] *See supra* note 519 for a definition of the fill rate.

[937] *See supra* section VII.D.1.(a)(2)(*b*)(vi) for a discussion of how the proposed amendment requiring reporting entities to report the number of shares that executed while an executable NMLO was in force increase transparency.

[938] *See, e.g., Price List—Trading Connectivity,* NASDAQ, *available at https://www.nasdaqtrader.com/trader.aspx?id=pricelisttrading2,* which describes how one market center charges its members a penalty for exceed a certain ''Weighted Order-to-Trade Ratio.''

[939] These information asymmetries are described in more detail in *supra* section VII.C.1.(a).

[940] *See infra* section VII.E.1.(a) for a discussion of an analysis showing that broker-dealers with 100,000 customers or greater handled 66.6% of customer orders and 1.5% of customer accounts identified in the data sample. Note that, if these smaller broker-dealers would attract enough customers such that they represent a more significant fraction of orders, it is likely they would also subsequently fall above the customer account threshold and be required to begin publishing Rule 605 reports.

[941] *See supra* section VII.D.1.(b)(1) for a discussion of the effects of the proposed amendments on competition between reporting entities on the basis of execution quality.

[942] For example, if investors make use of third-party summaries of Rule 605 reports, these summaries may not incorporate execution quality information outside of ''official'' Rule 605 reports. In that way, smaller broker-dealers would be unable to offer the same level of transparency even if they were to prepare an execution quality report containing all of the information and according to the exact specifications of Rule 605.

[943] *See supra* section VII.C.3.(a)(1) for a discussion of the current structure of the market for brokerage services.

[944] *See supra* section VII.D.1.(b)(1) for a discussion of the effects of the proposed amendments on competition between reporting entities on the basis of execution quality.

[945] The effect of switching costs on competition may also depend on the variability of reporting entities' execution quality over time. For example, if the execution quality of any given reporting entity varies significantly over time, customers of those reporting entities may find it optimal to switch between reporting entities with some frequency, which would increase their overall switching costs. On the other hand, if the execution quality of reporting entities is relatively constant over time, the number of times that a customer would optimally want to switch between reporting entities would likely be more limited, and in this case switching costs may be a relatively small and/or short-term friction.

First, if the costs for customers to switch broker-dealers are significant,[946] this would limit the extent to which Rule 605 promotes competition among broker-dealers on the basis of execution quality. However, switching costs for both individual and institutional investors may be limited. For example, institutional investors are likely to have multiple broker-dealers, which would facilitate the transfer of business to better-performing broker-dealers, and, for individual investors, transferring between retail brokers may be less costly, for example, because some retail brokers will compensate new customers for transfer fees that their outgoing broker-dealer may charge them.[947]

Second, the presence of switching costs that broker-dealers incur from changing the primary trading venues to which they route orders [948] may limit the effects of the proposed amendments on competition among market centers. However, the Commission expects this to be less of an issue for the larger broker-dealers that would be required to produce Rule 605 reports,[949] as these broker-dealers would likely face lower switching costs. For example, larger broker-dealers are likely already connected to multiple national securities exchanges. They are experienced with routing order flow across a larger variety of market centers and/or have sufficient bargaining power to renegotiate any agreements that they might have with individual market centers.

(3) Limited Usage and Search Costs

The benefits of the proposed amendments for transparency, competition, and execution quality may be limited if market participants are not likely to make use of the additional information available under the proposed amendments, *e.g.,* because this information is difficult to access or is not useful to market participants due to the availability of other sources of information about execution quality.

For example, investors currently have access to information about the execution quality achieved by their broker-dealers for their not held orders,[950] which in certain circumstances may be more relevant for institutional investors than aggregate information about the execution quality of broker-dealers' held orders [951] and may lead to a low usage rate by institutional investors of larger broker-dealers' Rule 605 reports as proposed to be required. This would limit the benefits of the proposed amendments for competition in the market for institutional brokerage services. However, to the extent that institutional investors' alternative sources of execution quality information do not contain information about all of their relevant orders, and/or cannot be easily used to compare across broker-dealers that an investors does not do business with,[952] the proposed amendments would likely impact competition for institutional brokerage services as well.

Furthermore, the volume and complexity of data produced by Rule 605 reports (*i.e.,* both the number of rows and columns of Rule 605 reports) would increase as a result of the proposed amendments to modify the coverage of orders and expand the information required by Rule 605. Both of these factors could make the evaluation of the raw data in Rule 605 reports costlier. If, in order to avoid this additional complexity, market participants would not incorporate the data elements or orders types that are proposed to be added to Rule 605 reports under the proposed amendments into their analyses of consumption of Rule 605 data, this would limit the potential benefits of the proposed amendments. However, market participants that currently have the resources to process and analyze the raw data contained in Rule 605 reports are likely to have the resources to process and analyze the additional data elements. To the extent that some investors may not have access to the resources to directly analyze the raw Rule 605 as a result of its increase in complexity,[953] the Commission expects that independent analysts, consultants, broker-dealers, the financial press, and market centers would continue to respond to the needs of investors by analyzing the disclosures and producing more digestible information using the data.[954]

The benefits of the proposed amendments for transparency, competition, and execution quality may also be limited by the presence of search costs. The proposed amendments are expected to increase the number of Rule 605 reporting entities from 236 to 359.[955] For those market participants that would seek to collect a complete or mostly complete set of Rule 605 reports, these market participants would need to search through and download reports from a greater number of websites, which would increase their search costs.[956] If, in order to avoid this increase in search costs, market participants would not incorporate execution quality information from the proposed additional reporting entities into their search or analysis of Rule 605 reports, this would limit the benefits of the proposed expansion of Rule 605 reporting entities.

(4) Liquidity Externalities

The effects of the proposed amendments on competition between market centers [957] may be limited by the development of liquidity externalities, or the consolidation of liquidity on a few dominant market centers.[958] Under such circumstances, while the consolidation of liquidity on market centers offering superior execution quality may benefit market participants in the short run, it may also lead to barriers to entry in the market for trading services, as new entrants may have a harder time attracting sufficient liquidity away from established liquidity centers. This could also lead to consolidation or exit by smaller market centers. This could have the effect of reducing competition in the market for trading services. The Commission is unable to quantify the likelihood that

[946] *See supra* section VII.C.3.(a)(1) for a discussion of switching costs related to switching broker-dealers.

[947] *See supra* note 745 for an example.

[948] *See supra* section VII.C.3.(b)(1) for discussions of switching costs broker-dealers may face when switching trading venues.

[949] The Commission believes that the competitive effects of the proposed amendments would principally accrue to larger broker-dealers, who would be required to prepare Rule 605 reports, and thus these would be the broker-dealers most likely to be incentivized to switch market-centers as a result of additional information about market center execution quality. However, these effects may spill over to smaller broker-dealers as well per the discussion in *supra* section VII.D.1.(d)(1). For these smaller broker-dealers, switching costs may be more binding.

[950] *See supra* note 60 and accompanying text discussing broker-dealers' requirements under Rule 606(b)(3) to provide individualized reports of execution quality upon request for not held orders.

[951] *See supra* section VII.C.3.(a)(1)(*b*) for a discussion of institutional investors' usage of not held orders.

[952] *See* discussion in *supra* section VII.C.1.(c)(2).

[953] *See supra* section VII.C.1.(c)(1) for a discussion of the difficulties that individual investors may face when accessing Rule 605 reports.

[954] *See supra* note 545–546 for examples of how third parties currently use Rule 605 data to produce information meant for public consumption.

[955] *See supra* section VI.C for a description of these estimates.

[956] *See supra* section VII.C.2.(d) for a discussion of the search costs associated with collecting information from Rule 605 reports.

[957] *See supra* section VII.D.1.(b)(1) for a discussion of the effects of the proposed amendments on competition between reporting entities on the basis of execution quality.

[958] For theoretical discussions of liquidity externalities see Marco Pagano, *Trading Volume and Asset Liquidity,* 104 Q. J. Econ. 255 (1989): Ananth Madhavan, *Consolidation, Fragmentation, and the Disclosure of Trading Information,* 8 Rev. Fin. Stud. 579 (1995).

some smaller market centers would cease operating.

(5) Dimensions of Execution Quality Not Captured by Rule 605 Reports

The expected benefits from the proposed amendments to Rule 605 may be lessened to the extent that there are dimensions of execution quality not captured by Rule 605 reports which drive order handling decisions. For example, the ability of customers and/or traders to remain anonymous or limit information leakage may not be a dimension that is easily discernible from looking at Rule 605 data, though it is a feature of execution quality that may be valued by some investors.[959] Similarly, the extent to which the reported statistics are perceived to fail to serve as an acceptable or timely proxy for a reporting entities' ability to secure favorable executions may dampen the benefits of proposed amendments for execution quality. This may happen if, for example, future market developments render the monthly reporting requirement to be too infrequent to be useful.

2. Costs

As discussed in detail below, the Commission recognizes that the proposed amendments to Rule 605 would result in initial and ongoing compliance costs to reporting entities. The Commission quantifies the costs where possible and provides qualitative discussion when quantifying costs is not feasible. Most of the compliance costs related to the proposed amendments to Rule 605 involve a collection of information, and these costs are discussed above in relation to the expected burdens under the Paperwork Reduction Act, with those estimates being used in the economic analysis below.[960]

(a) Compliance Costs

The Commission believes that the majority of costs related to the proposed amendments would be in the form of compliance costs, including both initial and ongoing. Table 9 provides a summary of the estimated change in compliances costs [961] resulting from the proposed amendments. The majority of both initial and ongoing compliance costs would be related to the proposed expansion of the scope of reporting entities. However, a significant portion of initial compliance costs would also result from the proposed amendments modifying the coverage of orders and information required by Rule 605, as current reporters would need to update their systems and additionally some new market centers trading in fractional shares would be required to report. Lastly, compliance costs resulting from the proposed amendment requiring reporting entities to prepare summary execution quality reports would mostly be ongoing.

TABLE 9—ESTIMATED COMPLIANCE COSTS, BY COST CATEGORY

Cost category	Initial compliance costs (million)	Ongoing compliance costs (million)
Expanding the Scope of Reporting Entities	$3.8	$3.9
Modifications to Information Required	3.4	1.9
Proposed Summary Execution Quality Reports	1.7	1.1
Total	8.9	6.8

Table 9: Estimated Compliance Costs, by Cost Category. This table presents estimates of the compliance costs related the to three broad categories of the proposed amendments to Rule 605 (expanding the scope of reporting entities, modifications to the coverage of orders and information required, and the proposed amendment requiring the preparation of summary reports). Numbers are based on the estimated number of respondents and PRA costs in sections VI.C and VI.D *supra* and have been rounded to the nearest tenth of million to avoid false precision. Further breakdowns of these estimates are presented in Tables 10, 11, and 12.

Table 9 further breaks compliance costs down into three separate categories—costs related to the expansion of reporting entities, costs related to modifications to information required, and costs related to the preparation of summary execution quality reports.

Estimates for the costs in each of these categories depend on a number of factors, including wages, inflation, and firm size, and the Commission acknowledges that the costs presented could be underestimated to the extent that wages and/or inflation are higher than those used in the estimation. Meanwhile, costs in each of these categories may also be overestimated if, instead of preparing reports in-house, reporting entities contracted with third-party vendors to prepare their reports.[962] The costs in Table 9 are based on the assumption that reporting entities would prepare their Rule 605 reports in-house. Due to their ability to leverage their technical expertise and potential economies of scale, third-party vendors may be able to prepare Rule 605 reports for a lower cost than if each individual reporting entity prepares its own report, and could pass these lower costs on to their customers, resulting in lower compliance costs. However, the Commission is unable to know the percentage of entities that currently make use of third-party vendors to prepare their Rule 605 reports, nor the percentage of entities that would make use of third-party vendors following the proposed amendments. Therefore, Commission is basing its compliance cost estimates on the potentially higher costs of in-house preparations of Rule

[959] *See, e.g.,* Carole Comerton-Forde & Kar Mei Tang, *Anonymity, Liquidity and Fragmentation,* 12 J. Fin. Mkt. 337 (2009), who found evidence of evidence of a migration in order flow from the non-anonymous New Zealand Exchange (NZX) to the Australian Stock Exchange after the latter increased anonymity by removing broker identifiers from the central limit order book.

[960] *See supra* section VI.D for a discussion of how the proposed amendments would create burdens under the PRA.

[961] Note that the discussion in section VI.D considers the total expected ongoing compliance costs for all reporting entities, both new respondents and current respondents. To focus on the costs that would directly follow from the proposed amendments, this section focuses on the expected change in ongoing costs, which excludes the portions of ongoing costs that current respondents currently incur.

[962] Specifically, the Commission estimates that, while preparing in-house reports would result on an annualized ongoing cost of $37,248 per respondent, contracting with a third party to prepare Rule 605 of their behalf would result in an annualized ongoing cost of $36,000 per respondent. *See supra* section VI.D. The Commission uses the higher of these costs in the present analysis to obtain a more conservative estimate of potential costs.

605 reports in order to be as conservative as possible.

(1) Compliance Costs Related To Expanding the Scope of Rule 605 Reporting Entities

As a result of the proposed amendments expanding the scope of Rule 605 reporting entities, market centers and broker-dealers that were previously not required to publish Rule 605 reports would incur initial costs to develop the policies and procedures to prepare Rule 605 reports for the first time, and ongoing costs to continue to prepare them each month. Larger broker-dealers would incur initial and ongoing compliance costs as a result of the proposed amendment expanding the scope of Rule 605 reporting entities to include large broker-dealers. Similarly, the proposed amendments requiring reporting entities to prepare separate reports for their SDPs and qualified auctions would similarly result in market centers that were previously not required to prepare Rule 605 reports facing initial and ongoing compliance costs. The Commission estimates that 85 broker dealers, along with 10 SDPs and 8 qualified auctions,[963] would be required to start publishing Rule 605 reports as a result of the proposed amendments expanding the scope of Rule 605 reporting entities. Table 10 breaks down the initial and ongoing compliance costs associated these three types of reporting entities.

TABLE 10—ESTIMATED COMPLIANCE COSTS RELATED TO PROPOSED EXPANSION OF RULE 605 REPORTING ENTITIES

	Number of respondents	Initial compliance costs (million)	Ongoing compliance costs (million)
Broker-Dealers	[a] 85	[b] $3.1	[c] $3.2
SDPs	[d] 10	[b] 0.4	[c] 0.4
Qualified Auctions	[e] 8	[b] 0.3	[c] 0.3
Total	103	3.8	3.9

Table 10: Estimated Compliance Costs Related to Proposed Expansion of Rule 605 Reporting Entities. This table presents estimates of the compliance costs related to the proposed amendments to Rule 605 expanding the scope of reporting entities. Numbers are based on the estimated number of respondents and PRA costs in sections VI.C and VI.D *supra* and have been rounded to the nearest tenth of million to avoid false precision.

[a] The number of new broker-dealer respondents is estimated using data from 2021 FOCUS Report Form X–17A–5 Schedule I filings and CAT, according to the procedure described in detail in *infra* note 1008.

[b] The estimate of initial compliance costs to new respondents is based on the monetized initial burden in *supra* note 491 for new respondents, assuming that these respondents would incur 100 initial burden hours at an average hourly cost of ($37,020/100 hours) = $370.20 per respondent per hour.

[c] The estimate of ongoing compliance costs to new respondents is based on the monetized annual burden in *supra* note 492 for new respondents, assuming that these respondents would incur 8 ongoing burden hours per month (12 per year) at an average hourly cost of ($37,488/(8 hours * 12 months)) = $391.00 per respondent per hour.

[d] The Commission does not have knowledge of the number of SDPs in operation and there has chosen a conservative estimate of 10 SDPs.

[e] The Commission is not able to know the number of qualified auctions that would begin operation if the Order Competition Rule Proposal were to be adopted, and has therefore chosen a conservative estimate of 8 qualified auctions.

New reporters would face one-time, initial compliance costs to develop and implement the policies and procedures to prepare Rule 605 reports for the first time. The Commission believes that the majority of these costs would relate to the development of systems to obtain, store and process the data required for Rule 605 reports.

Larger broker-dealers that generally or exclusively route orders away would need to obtain information, such as the time of order execution and execution price, from trade confirmations provided by the execution venue. In addition, both broker-dealers and market centers would need to match their order information to historical price and depth information available via the exclusive SIPs or, following the implementation of the MDI Rules, competing consolidators,[964] to determine the NBBO (and/or best displayed) quote and size at the time of order receipt (or executability) and at the time of order execution, and use this data to calculate the required statistics.[965] These new reporters likely already retain most, if not all, of the underlying raw data necessary to generate these reports in electronic format or may obtain this information from publicly available data sources, and currently calculate similar measures to those that would be required under Rule 605 as proposed for their own internal purposes.[966] However, as a result of the proposed amendments, new reporters may have to acquire or develop data specialists and/or programmers to the extent that the information required by Rule 605 as proposed is different or more complex than the information that the new reporters typically processes, and/or acquire legal specialists to ensure compliance with the Rule.

[963] *See supra* note 483 and accompanying text for a discussion of these estimates. *See also infra* section VII.E.1.(a) for a discussion of estimating the number of larger broker-dealers (*i.e.,* broker-dealers that introduce or carry customers above a threshold number of customer accounts), that would be required to prepare execution quality reports pursuant to Rule 605, defining the customer account threshold as 100,000 customer accounts.

[964] *See supra* section VII.C.1.(d)(2).

[965] *See supra* note 196 and accompanying text.

[966] For example, broker-dealers may calculate similar measures as part of their Best Execution Committees' periodic review. *See supra* note 567 and accompanying text.

These compliance costs related to expanding the scope of Rule 605 reporting requirements may be under- or overestimated to the extent that larger broker-dealers, which are assumed to have the same compliance costs as SDPs and qualified auctions in Table 10, could experience higher or lower initial and/or ongoing costs than other types of reporting entities. For example, larger broker-dealers may incur higher initial costs to the extent that they do not currently obtain transaction information, such as the time of order execution and execution price, from trade confirmations provided by execution venues, and therefore would need to develop the procedures for doing so. Broker-dealers may also face higher ongoing costs as compared to market centers that mostly execute the shares that they receive, if collecting information for trades executed at away market centers is costlier than analyzing in-house trade information; *e.g.,* because it results in delays in processing the trade information. On the other hand, larger broker-dealers may incur lower initial costs if they are more likely than market centers to already calculate similar measures to those proposed as part of their Best Execution Committees' periodic review.[967] In addition, the Commission does not believe that there would be significant additional costs to collecting information for trades executed at away market centers, as given the monthly reporting frequency of Rule 605 reports, broker-dealers should have sufficient time to collect and process the information. Since it is not possible to determine whether larger broker-dealers would face higher or lower compliance costs than other types of market centers, the Commission is conservatively estimating that broker-dealers will incur the same compliance costs as other types of reporting entities.

Furthermore, many of the larger broker-dealers that would be newly included in the scope of reporting requirements already have experience with filing Rule 605 reports; *e.g.,* because they operate an ATS, engage in market making, or are otherwise affiliated with market centers that currently files Rule 605 reports.[968] Likewise, SDPs and qualified auctions could also have lower initial costs to the extent that they are operated by market centers that are currently required to publish Rule 605 reports. In both cases, these reporting entities could leverage this experience to prepare the reports for these additional lines of businesses more cost effectively.

(2) Compliance Costs Related to Modifications to the Coverage of Orders and Information Required by Rule 605 Reports

As a result of the proposed amendments modernizing and expanding the coverage of orders and information required by Rule 605 reports, reporting entities would incur initial compliance costs and additional ongoing compliance costs.[969] First, the estimated 236 current reporters [970] would incur initial costs to update their systems to collect and store new information and to calculate modernized and additional metrics, as well as a potential increase in ongoing costs as a result of additional data that would need to be collected and stored. Second, the proposed amendment expanding the coverage of order sizes included in Rule 605 to include orders for less than one share would result in an additional estimated 20 market centers that trade exclusively in fractional shares would be required to begin filing Rule 605 reports.[971] Third, the 16 national securities exchanges and 1 national securities association would be required to amend the NMS Plan to account for the new data fields required to be reported. Table 11 breaks down the associated initial and ongoing compliance costs.

TABLE 11—ESTIMATED COMPLIANCE COSTS RELATED TO PROPOSED AMENDMENTS MODIFYING THE INFORMATION REQUIRED BY RULE 605

	Number of respondents	Initial compliance costs (million)	Ongoing compliance costs (million)
Costs to Current Reporters	[a] 236	[b] $2.6	[c] $1.1
Costs to Market Centers Trading Fractional Shares	[d] 20	[e] 0.7	[f] 0.7
Cost to NMS Plan Participants to Update Data Fields	[g] 17	[h] 0.06	[i] 0
Total	272	3.4	1.9

Table 11: Estimated Compliance Costs Related to Proposed Amendments Modifying the Information Required by Rule 605. This table presents estimates of the compliance costs related to the proposed amendments to Rule 605 modifying the coverage of orders and information required by Rule 605 reports. Numbers are based on the estimated number of respondents and PRA costs in sections VI.C and VI.D *supra* and have been rounded to the nearest tenth of million to avoid false precision.

[967] *See supra* note 567 and accompanying text.

[968] For example, based on larger broker-dealers' answers in their Q4 2021 FOCUS Report Form X–17A–5 Schedules I and II, staff estimates that 29 out of the 85 broker-dealers identified as introducing or carrying at least 100,000 customers also engage in OTC or specialist market making activities. Specifically, 20 of these larger broker-dealers answered ''Yes'' to item 8075 of Schedule I, asking whether a respondent is registered as a specialist on a national securities exchange in equity securities, 16 of them reported non-missing gains or losses from OTC market making in exchange listed equity securities in item 3943 of Schedule II, while 7 of them reported both OTC and specialist equity market maker activities.

[969] This analysis considers the baseline against which to compare the costs that would accrue to larger broker-dealers, SDPs, and qualified auctions to be a world in which do not have to publish Rule 605 reports, and not a world in which these reporting entities are required to publish Rule 605 under current reporting requirements. As such, this section does not consider the cost of the proposed amendments modifying the coverage and information required by Rule 605 to those reporting entities that would begin publishing Rule 605 reports as a result of the proposed amendments expanding the scope of Rule 605 reporting entities.

[970] *See supra* note 483 and accompanying text for a discussion of these estimates.

[971] These market centers are identified using the CAT data described in *supra* note 644, as firm MPIDs that executed fractional shares during the sample time period that did not have a corresponding Rule 605 report. These firms are relatively large, with an average net capital of $1.66 billion, which is similar to the average net capital of all larger broker-dealers that meet the customer account threshold of at least 100,000 customer accounts ($1.59 billion). In fact, the Commission estimates that 16 of the markets centers that exclusively execute fractional shares are also larger broker-dealers that meet the customer account threshold. Under proposed Rule 605(a)(7), to the extent that a market center that exclusively executes fractional shares is also a broker-dealer that meets or exceed the customer account threshold, then this reporting entity would be required to file separate Rule 605 reports pertaining to each function. *See supra* note 166.

[a] The number of current respondents includes 16 national securities exchanges, 1 securities association, 32 ATSs (based on the number of effective Form ATS–N filings), and an estimated 93 OTC market makers and 94 exchange market makers (based on firms' responses on their 2021 FOCUS Report Form X–17A–5 Schedules I and II).

[b] The estimate of initial compliance costs to current respondents is based on the monetized initial burden in *supra* note 488 for current respondents, assuming that these respondents would incur 30 initial burden hours as a result of the amendments at an average hourly cost of ($18,510/50 hours) = $370.20 per respondent per hour.

[c] The estimate of ongoing compliance costs to current respondents is based on the monetized annual burden in *supra* note 489 for current respondents, assuming that these respondents would incur 1 additional ongoing burden hours per month (12 per year) as a result of the amendments at an average hourly cost of ($37,488/(8 hours * 12 months)) = $391.00 per respondent per hour.

[d] The Commission does not have knowledge of the number of market centers currently trading in fractional shares that would newly be required to prepare Rule 605 reports, and has therefore chosen a conservative estimate of 20 firms.

[e] The estimate of initial compliance costs to new respondents (in this case, market centers that would newly be required to prepare Rule 605 reports as a result of trading fractional shares) is based on the monetized initial burden in *supra* note 491 for new respondents, assuming that these respondents would incur 100 initial burden hours at an average hourly cost of ($37,020/100 hours) = $370.20 per respondent per hour.

[f] The estimate of ongoing compliance costs to market centers that would newly be required to prepare Rule 605 reports as a result of trading fractional shares is based on the monetized annual burden in *supra* note 492 for new respondents, assuming that these respondents would incur 8 ongoing burden hours per month (12 per year) at an average hourly cost of ($37,488/(8 hours * 12 months)) = $391.00 per respondent per hour.

[g] The number of NMS plan participants includes 16 national securities exchanges and 1 securities association.

[h] The estimate that the monetized initial burden for preparing and filing an amendment to the NMS Plan would include approximately $40,222 in aggregate internal costs per participants as well as an aggregate external cost of $16,864 resulting from outsourced legal work. *See supra* section VI.D.

[i] The Commission estimates that the costs related to updating data fields would be a one-time cost, and thus would not incur any additional ongoing compliance costs.

As a result of the proposed amendments, current Rule 605 reporters would incur initial compliance costs to update their systems to collect and store new information.[972] For example, current Rule 605 reporters would need to expand their data collection systems to include additional order types, such as stop orders, short sale orders, and orders submitted outside of regular trading hours, and would need to update their systems to reclassify certain orders, such as IOCs, riskless principal orders, and beyond-the-midpoint NMLOs, into new or different order type categories. Similarly, current reporters would need to expand their data collection systems to incorporate additional order sizes, including odd-lots, fractional orders, and larger-sized orders.

Current Rule 605 reporters would also incur initial compliance costs to update their data processing software to generate modernized and additional metrics. For example, current Rule 605 reporters would need to update their methodologies for calculating realized spread, first, to include two measures, and, second, to calculate the realized spread using 15 second and 1 minute horizons, instead of 5 minutes, and would need to develop programs (*i.e.,* code) to calculate newly required metrics, such as E/Q. Some of the metrics would involve matching trade information to data elements that are not currently required by Rule 605 but that can be obtained from public data sources, such as the best displayed price for calculating the proposed new price improvement metrics,[973] and the number of shares displayed at the NBBO for calculating the benchmark measure related to size improvement.[974] To the extent that they do not already do so, current Rule 605 reporters would also need to update their systems to record timestamps in terms of milliseconds rather than seconds as a result of the proposed amendment increasing the granularity of time-to-execution metrics.

The Commission believes that, after current Rule 605 reporters update their systems to reflect the amendments, changes to their ongoing costs would be limited, as the process for generating and publishing Rule 605 reports would largely be unchanged.[975] This is because most reporting entities currently retain most, if not all, of the underlying raw data necessary to generate the additional data elements, or are easily able to obtain this information from publicly available data sources. Furthermore, once reporting entities have developed the necessary programs to calculate the required metrics, there is limited additional effort that needs to be made beyond what current reporters are already doing, such as monitoring and debugging these statistical programs. However, the Commission recognizes that there may be some additional ongoing costs to the extent that some metrics introduced under the proposed amendments may require more data storage or more complex calculations, such that the cost of preparing monthly Rule 605 reports may increase. Therefore, the Commission has allocated addition ongoing costs to account for this possibility.[976]

As a result of the proposed amendment expanding the scope of Rule 605 to include information about orders for less than one share, the Commission estimates that some broker-dealers that exclusively execute fractional shares, and therefore do not currently file Rule 605 reports in their capacity as a market center due to fractional shares falling below the smallest order size category in current Rule 605, would be required to begin publishing Rule 605 reports. These broker-dealers would incur similar initial and ongoing costs as those discussed above for larger broker-dealers, SDPs, and qualified auctions that would be included as a result of the expanded scope of reporting entities. These compliance costs may be over- or underestimated if broker-dealers that exclusively execute fractional shares have different characteristics (*e.g.,* fewer customers) than the larger broker-dealers that would be included as a result of the expanded scope of reporting entities.

Lastly, the Commission estimates that the 16 national securities exchanges and 1 national securities association would incur a one-time initial cost to amend the NMS Plan to account for the new data fields required to be reported. The Commission estimates that this would mostly consist of legal time to develop

[972] The Commission assumes that the majority of reporting entities' initial burden hours under the PRA would be spent updating current systems as a result of the many changes to Rule 605, and thus estimate that 30 of the 50 initial burden hours estimated for current respondents and described in *supra* note 488 would be allocated to compliance with the proposed amendments modifying the information contained in Rule 605.

[973] *See supra* section IV.B.5 for a discussion of the data required to calculate this measure.

[974] *See supra* section IV.B.4.(e) for a discussion of the data required to calculate this measure.

[975] One exception is the proposed amendment requiring reporting entities to prepare summary reports summarizing key information from their Rule 605 reports. The Commission assumes that current reporters would face additional ongoing costs as a result of this amendment, and discuss these costs in *infra* section VII.D.2.(a)(3).

[976] Specifically, one additional ongoing monthly burden hour per respondent has been added to account for this possibility. *See* footnote to Table 11.

and draft the amendments to the NMS Plan.

(3) Compliance Costs Related to the Proposed Summary Execution Reports

The estimated 236 current Rule 605 reporters[977] would face additional initial and ongoing compliance cost as a result of the proposed amendment requiring reporting entities to prepare summary reports summarizing key information from their Rule 605 reports.[978] Table 12 breaks down the initial and ongoing compliance costs associated with this amendment.

TABLE 12—ESTIMATED COMPLIANCE COSTS RELATED TO PROPOSED AMENDMENT REQUIRING SUMMARY EXECUTION QUALITY REPORTS

	Number of respondents	Initial compliance costs (million)	Ongoing compliance costs (million)
Costs to Prepare Summary Execution Quality Reports	[a] 236	[b] $1.7	[c] $1.1

Table 12: Estimated Compliance Costs Related to Proposed Amendment Requiring Summary Execution Quality Reports. This table presents estimates of the compliance costs related to the proposed amendments to Rule 605 requiring Rule 605 reporting entities to prepare summary execution quality reports. Numbers are based on the estimated number of respondents and PRA costs in sections VI.C and VI.D *supra* and have been rounded to the nearest tenth of million to avoid false precision.

[a] The number of current respondents is estimated as including 16 national securities exchanges, 1 securities association, 32 ATSs (based on the number of effective Form ATS–N filings), 93 OTC market makers, and 94 exchange market makers (based on firms' responses on their 2021 FOCUS Report Form X–17A–5 Schedules I and II).

[b] The estimate of initial compliance costs to current respondents is based on the monetized initial burden in *supra* note 488 for current respondents, assuming that these respondents would incur 20 initial burden hours as a result of the amendments at an average hourly cost of ($18,510/50 hours) = $370.20 per respondent per hour.

[c] The estimate of ongoing compliance costs to current respondents is based on the monetized annual burden in *supra* note 489 for current respondents, assuming that these respondents would incur 1 additional ongoing burden hours per month (12 per year) as a result of the amendments at an average hourly cost of ($37,488/(8 hours * 12 months)) = $391.00 per respondent per hour.

The Commission estimates that these costs would be only a fraction of the overall costs to comply with Rule 605 reporting requirements, as they would contain only a small subset of the information published in the fuller Rule 605 reports. However, this may underestimate costs to the extent that these summary reports, which are intended to be human-readable and therefore have a different format (PDF file), are costlier to prepare and/or store than machine-readable data.[979]

(4) Implications of Compliance Costs for Competition

While the Commission believes that the primary competitive effect of the proposed amendments would be to increase competition between reporting entities on the basis of execution quality,[980] it is possible that the proposed amendments would have a negative impact on competition if the associated compliance costs described above prevent the entry of new reporting entities or cause some entities to leave the market.

The Commission is unable to quantify the likelihood that a either a trading venue or a brokerage firm would cease operating as a result of the compliance costs associated with the proposed amendments. While the Commission does not believe that these compliance costs are large enough such that this would be likely,[981] the Commission recognizes this possibility depends in part on whether the compliance costs associated with Rule 605 are likely to be fixed or variable. If Rule 605 compliance costs represent a fixed cost, these costs could represent a significant portion of a smaller reporting entity's revenue, such that the reporting entity could become unprofitable if subjected to these costs.[982] This could impact competition between reporting entities, for example, by causing some reporting entities to leave the market, or preventing the entry of new ones. It could also result in broker-dealers avoiding taking on more than 100,000 customers, to avoid crossing the customer account threshold such that they would need to being complying with Rule 605 reporting requirements.

On the other hand, if Rule 605 compliance costs are variable, then the scalability of compliance costs would mean that smaller reporting entities would incur lower compliance costs related to execution quality reports, which would mitigate some of these concerns. Rule 605 compliance costs could be variable, *e.g.,* because smaller reporting entities handle lower order volumes and therefore would require less data storage and less complexity when calculating the metrics required by Rule 605 as proposed.

Furthermore, even if compliance costs of preparing Rule 605 reports are fixed from the perspective of reporting entities (this would be the case, *e.g.,* if variable costs such as data storage are dominated by fixed costs such as costs for compliance and data personnel), they may be lower if reporting entities make use of third-party vendors, who can leverage economies of scale to spread fixed costs across the potentially many reporting entities that they

[977] This section does not consider the cost of the proposed amendments to those reporting entities that would begin publishing Rule 605 reports as a result of the proposed amendments expanding the scope of Rule 605 reporting entities. *See* explanation in *supra* note 969.

[978] The Commission believes that a significant portion of reporting entities' initial burden hours under the PRA would be allocated to updating current systems to prepare summary reports, which would entail both a new format and a new level of information aggregation as compared to current Rule 605, and thus estimate that 20 of the 50 initial burden hours estimated for current respondents and described in *supra* note 488 would be allocated to compliance with the proposed amendments modifying the information contained in Rule 605.

[979] For example, a single letter ''a'' results in a PDF file of 7,706 bytes vs. a TXT file of 1 byte. *See, e.g., File Size,* U.S. Pat. & Trademark Office, *available at https://www.uspto.gov/ebc/portal/infofilesize.htm.* However, the lower information content of the summary file PDFs likely results in lower file sizes despite the larger per-pixel storage requirements.

[980] *See supra* section VII.D.1.(b)(1) for a discussion of the effects of the proposed amendments on competition between reporting entities on the basis of execution quality.

[981] For example, data on broker-dealers' median monthly revenues from FOCUS Report Form X–17A–5 Schedule II show that the estimated monthly compliance cost would represent 0.09% of the monthly revenues of broker-dealers with 100,000 customers or less, and 0.003% of the monthly revenues of broker-dealers with 100,000 customers or more.

[982] The Commission does not believe that this compliance costs are large enough such that this would be likely. *See id.*

service, to prepare Rule 605 reports on their behalf. Therefore, to the extent that reporting entities make use of third-party vendors to prepare their Rule 605 reports, and these vendors charge reporting entities variable report preparation fees (*e.g.,* based on the amount of data), this could lead to data vendors charging lower prices to prepare the Rule 605 reports of smaller reporting entities. This would also reduce the burdens of compliance costs for smaller reporting entities.

However, even if some smaller reporting entities were to exit, the Commission does not believe this would significantly impact competition in either the market for brokerage services or the market for trading services, because both markets are served by a large number of competitors.[983] The Commission recognizes that smaller reporting entities may have unique business models that are not currently offered by competitors, but the Commission believes a competitor could create similar business models if demand were adequate.

(b) Other Potential Costs

The Commission has preliminarily identified costs in addition to compliance costs that some market participants may incur as a result from the proposed amendments. Many of these costs are difficult to quantify, especially as the practices of market participants are expected to evolve and may change due to the information on execution quality that is required to be reported under the proposed amendments to Rules 605. Therefore, much of the following discussion is qualitative in nature.

(1) Costs to Reporting Entities of Improvements to Execution Quality

In addition to compliance costs, the proposed amendments could result in costs to some reporting entities based on how market participants adjust their behavior in response to increased transparency and competition on the basis of execution quality.[984]

First, increased transparency and competition on the basis of execution quality, and subsequent scrutiny by customers and other market participants, might make broker-dealers less likely to route orders based on payment relationships and/or fees and rebates. While this would likely benefit customers in the form of better execution quality, if broker-dealers were to reduce the order flow sent to wholesalers who pay for it, the broker-dealers would receive less payment for such order flow and might pass the lost payments on to their customers, for example, by raising brokerage commissions or other fees. Similarly, if broker-dealers were to route orders to trading centers with lower rebates and higher fees, they might pass the reduction in rebate revenue and increase in fee costs on to their customers, for example, by raising brokerage commissions or other fees. Broker-dealers may pass lost payments or revenues along to customers in other ways as well, for example by reducing the quality of some bundled services or paying a lower interest rate on deposit accounts.

Second, increased competition on the basis of execution quality may result in costs to reporting entities to the extent that they need to update or improve their routing or execution systems in order to remain competitive. However, should these improvements result in improved execution quality for investors, any costs to a reporting entity of improvements to their routing or execution systems would be offset by benefits to other market participants, *i.e.,* investors.

It is possible that the capital expenditure associated with such an upgrade may be such that some reporting entities would no longer remain profitable. The Commission is unable to estimate the number of reporting entities that may leave the market as a result of no longer being able to compete with other reporting entities on the basis of execution quality. However, the Commission does not believe this would significantly impact competition in either the market for brokerage services or the market for trading services, because both markets are served by a large number of competitors and that, if a reporting entity were to exit for this reason, these markets would be served by more efficient firms that are better able to offer execution quality to customers in line with its industry peers.

(2) Costs for Smaller Broker-Dealers

There may be additional costs to the proposed amendments if smaller broker-dealers, who would not be subject to Rule 605 reporting requirements under the proposed amendments but may face competitive pressure to provide customers with more information and execution quality, would also face initial and ongoing costs to provide customers with execution quality reports.[985] The costs for smaller broker-dealers to prepare execution quality reports may not be the same as the costs for larger broker-dealers. Smaller-broker dealers may lack the technical expertise and compliance experience of larger broker-dealers, which would tend to lead to higher costs; however, smaller broker-dealers may also have lower costs if their lower order volume and customer account numbers lead to less complexity when calculating the metrics required in the reports.

(3) Potential for Less Transparency

The proposed amendments expanding the set of Rule 605 reporting entities to include larger broker-dealers could impose a cost on broker-dealer customers if those broker-dealers that currently voluntarily provide their customers with execution quality reports stop providing these reports, which potentially contain more or different information than what the proposed amendments require.[986] Some broker-dealer customers, especially institutional investors, currently request reports about the handling of their orders from their broker-dealers.[987] These reports may be less or more detailed and provide different and potentially less or potentially more information than those required by Rule 605 as proposed to be amended. To the extent that these reports are more detailed or provide more information than Rule 605 as proposed to be amended, and to the extent that broker-dealers would be less incentivized to provide these reports to their customers as a result of the proposed amendments,[988] broker-dealer customers may have access to less information as a result of the proposed amendments. The Commission preliminarily believes that this scenario is not very likely because customers could still request additional information or customized reports from

[983] *See supra* section VII.C.3.(a)(1) for a discussion of the structure of the market for brokerage services, and *supra* section VII.C.3.(a)(2) for a discussion of the structure of the market for trading services.

[984] *See supra* Section VII.D.1.(b)(1) for a discussion on how the proposed amendments would increase competition on the basis of execution quality. The costs to reporting entities associated with increased transparency and competition on the basis of execution quality would likely represent a transfer from these reporting entities to other market participants.

[985] *See infra* section VII.D.1.(d)(1) for a discussion of the impact of the proposed amendments on smaller broker-dealers.

[986] These reports could include, for example, public reports prepared according to the FIF Template (*see supra* note 450), or private ad hoc reports the broker-dealers prepare for their customers (*see* discussion in section VII.C.1.(c)(2) *supra*).

[987] *See supra* section VII.C.1.(c)(2) for a discussion of the practice of institutional investors requesting execution quality reports from their broker-dealers.

[988] Note that this does not apply to broker-dealer's requirements to provide customers with execution quality information about their not held orders.

their broker-dealers and broker-dealers may be incentivized to satisfy such requests, to the extent they currently do, to retain their customers.[989]

(4) Potential for Lower Execution Quality

The Commission acknowledges that, to the extent that the proposed amendments to Rule 605 fail to capture relevant dimensions of execution quality or cause market participants to focus on some dimensions of execution quality to the detriment of others, the proposed amendments may reduce execution quality along certain dimensions that may be relevant to some investors. The nature of execution quality as a multi-faceted concept has been a focus of academic papers, which have pointed out that execution quality is composed of multiple aspects or dimensions, including price and speed, among others.[990] As stated by the Commission in the Adopting Release, different investors may have different concerns and priorities related to execution of their orders.[991] If the proposed amendments tend to favor certain dimensions of execution quality while excluding or neglecting others, there is a possibility that certain investor groups may be advantaged by the proposed amendments to the disadvantage of other investor groups.

For example, average effective spreads calculated for NMLOs capture the portion of the spread that is earned by liquidity providers and paid by liquidity demanders.[992] If reporting entities compete for NMLOs by offering a wider effective spread, NMLO execution prices would improve at the expense of the execution prices of the marketable orders. There is a similar trade-off between, *e.g.,* time-to-execution and execution prices for NMLOs, as a broker-dealer seeking to improve the time-to-execution of NMLOs may favor routing those orders to an inverted venue where, as marketable orders earn a rebate, it may be more likely to attract a counterparty; this could incentivize trading venues to compete on rebates rather than on execution quality. Another example would be, if size improvement becomes a major driver of order flow, national securities exchanges may try to incentivize hidden liquidity and broker-dealers may route orders to venues with higher expected hidden orders, as size improvement measures mechanically benefit from a greater degree of hidden volume.[993] It is possible that incentivizing hidden liquidity at the cost of displayed orders may negatively impact market quality by obfuscating trading interest information and discouraging trade by making order books look thinner than they actually are.

(5) Costs To Update Best Execution Methodologies

As a result of the proposed amendments, financial service providers that are subject to best execution obligations[994] would likely reevaluate their best execution methodologies to take into account the availability of new statistics and other information that may be relevant to their decision making. This may impose a cost only to the extent that broker-dealers and/or investment advisers choose to build the required statistics into their best execution methodologies. The proposed amendments do not, however, address and therefore do not change the existing legal standards that govern financial service providers' best execution obligations.[995]

3. Economic Effects on Efficiency, Competition, and Capital Formation

(a) Efficiency

The Commission preliminarily believes the proposed amendments to Rule 605 would improve the efficiency of analyzing 605 reports, which would result in improved price efficiency. Price efficiency would improve as a result of improvements in order execution quality that would result from increased transparency and thus competition. As investors would benefit from improved execution quality as a result of the proposed amendments, these investors would also likely benefit from lower transaction costs. Transaction costs reflect the level of efficiency in the trading process, with higher transaction costs reflecting less efficiency and more friction, which limits the ability for prices to fully reflect a stock's underlying value.[996] Academic literature defines friction in financial markets to measure ''the difficulty with which an asset is traded,''[997] and as ''the price paid for immediacy.''[998] Friction makes it more costly to trade and makes investing less efficient, and it limits the ability of arbitrageurs or informed customers to push prices to their underlying values. Thus, friction makes prices less efficient. The proposed amendments to Rule 605 would improve order execution quality and reduce transaction costs. This, in turn, would reduce financial frictions and improve price efficiency.

(b) Competition

As previously discussed in the benefits section of this economic analysis, the Commission believes that the proposed amendments to Rule 605 would facilitate competition on the basis of execution quality in the markets for brokerage services and trading services.[999] The proposed amendments may also have additional effects on competition, such as increasing the extent to which Rule 605 reporting entities compete within other quality areas (such as rebates and transaction fees), and increasing competition in related markets (such as the market for TCA).

(1) Competition in Other Areas

An increase in the extent to which Rule 605 reporting entities compete on the basis of execution quality as a result of the proposed amendments may also spill over to increase incentives to compete along other lines, *i.e.,* reduce fees or increase rebates (including PFOF), or offer new products or functionalities to attract customers.

First, national securities exchanges may be incentivized to increase rebates or lower fees as a result of the proposed amendments. Exchanges compete on the basis of fees and rebates to incentivize broker-dealers to route more order flow to them.[1000] If an exchange offers the

[989] *See, e.g.,* 2018 Rule 606 Amendments Release, 83 FR 58338 (Nov. 19, 2018) at 58403, which discusses a similar potential cost and further notes that the willingness of broker-dealers to provide such customized reports to customers and the level of detail in such a report might depend on the business relationship between the broker-dealer and the customer, such as whether the customer does a large amount of business with the broker-dealer.

[990] *See, e.g.,* Robert Battalio, Brian Hatch & Robert Jennings, *All Else Equal?: A Multidimensional Analysis of Retail, Market Order Execution Quality,* 6 J. Fin. Mkt. 143 (2003); Ekkehart Boehmer, *Dimensions of execution quality: Recent evidence for US equity markets,* 78 J. Fin. Econ. 553 (2005); Emiliano S. Pagnotta & Thomas Philippon, *Competing on Speed,* 86 Econometrica 1067 (2018).

[991] *See* Adopting Release, 65 FR 75414 (Dec. 1, 2000) at 75432.

[992] *See supra* note 709 and accompanying text for a discussion of the interpretation of average effective spreads for NMLO.

[993] For example, if two exchanges have 200 shares available at the NBO price but one exchange is hiding a portion of this interest, a market order to purchase 200 shares would record size improvement on the venue with hidden liquidity but wouldn't on the other venue.

[994] *See supra* notes 565–566 and accompanying text.

[995] *See supra* note 69.

[996] *See* Hans R. Stoll, *Friction,* 55 J. Fin. 1479 (2000).

[997] *See id.*

[998] *See* Harold Demsetz, *The Cost of Transacting,* 82 Q. J. Econ. 33 (1968).

[999] *See supra* section VII.D.1.(b)(1) for a detailed discussion of the effects of the proposed amendments on competition in these markets on the basis of execution quality.

[1000] *See supra* section VII.C.3.(b)(2) for a discussion of competition between national

same execution quality as another reporting entity, an exchange may be incentivized to lower its transaction fees or raise its rebates in order to increase its competitive position in attracting more customers or order flow.[1001] To the extent that this occurs and to the extent that the resulting lower fees or higher rebates would be passed on to investors, this could be beneficial for investors.

Reporting entities may also be incentivized to innovate to offer new products in order to compete. For example, some broker-dealers may be incentivized to differentiate themselves by offer new functionalities that appeal to customers, such as the ability to trade on margin, in additional asset classes, such as options, or trade fractional shares.[1002]

(2) Competition in Related Markets

Second, the proposed amendments to Rule 605 could also have an impact on markets other than brokerage and trading services, such as the market for TCA. For example, suppose that a customer chooses to no longer purchase TCA once Rule 605 reports as proposed to be amended become available, because the customer decides that the information contained in the reports is sufficient. If fewer customers purchase TCA, this would have a negative impact on the market for third-party providers of TCA as well as third-party data vendors, because of a reduction in the demand for their services. Further, the quality of TCA provided by third parties may decrease because third-party providers of TCA might have fewer resources for the development and maintenance of their product offerings and because with fewer customers, third-party providers may have less data to use to build their models. At the same time, the quality of TCA reports may also improve if their publishers need to offer better products in order to compete with the publicly available data, and/or use the expanded information available under the proposed amendments to Rule 605 to offer new or better products.

(c) Capital Formation

The Commission preliminary believes the proposed amendments to Rule 605 may promote capital formation by improving price efficiency. As discussed above, the proposed amendments would improve order execution quality and reduce transaction costs, which would improve price efficiency. Improved price efficiency would cause firms' prices to more accurately reflect their underlying values, which may improve capital allocation and promote capital formation.

Financial frictions may have an adverse impact on capital formation. In particular, higher transaction costs may hinder customers' trading activity that would support efficient adjustment of prices and, as a result, may limit prices' ability to reflect fundamental values. Less efficient prices may result in some issuers experiencing a cost of capital that is higher than if their prices fully reflected underlying values, and in other issuers experiencing a cost of capital that is lower than if their prices accurately reflected their underlying value, as a result of the market's incomplete information about the value of the issuer. This, in turn, may limit efficient allocation of capital and capital formation.

By improving order execution quality and reducing transaction costs, the proposed amendments would reduce financial frictions and promote investor's ability to trade. This would have the effect of promoting capital formation through improved price efficiency.

E. Reasonable Alternatives

1. Reasonable Alternative Modifications to Reporting Entities

(a) Different Customer Account Thresholds for Differentiating Larger Broker-Dealers

The Commission also considered alternatives to the proposed amendment to require larger broker-dealers[1003] to prepare execution quality reports pursuant to Rule 605 and exclude broker-dealers that introduce or carry less than a threshold number of customer accounts, defining the customer account threshold as 100,000 customer accounts.[1004] Lowering this threshold would increase the total costs of the proposed amendments, as more broker-dealers would be subject to the costs of preparing Rule 605 reports; however, lowering the threshold may also be beneficial if more broker-dealer customers are able to benefit from the proposed modifications to reporting entities.[1005] On the other hand, raising the customer account threshold would lower the total costs of the proposal, but may result in fewer broker-dealer customers benefiting from the proposed modifications to reporting entities.

In order to examine the number of broker-dealers that would be subject to the collection of information obligations of Rule 605 as a result of the proposed modifications to reporting entities for different levels of the customer account threshold, it is necessary to estimate the number of customers for both carrying and introducing broker-dealers.[1006] In order to estimate the number of carrying broker-dealers' customers, the Commission used data from broker-dealers' 2021 FOCUS Report Form X–17A–5 Schedule I, which asks respondents whether they carry their own public customer accounts, along with the number of carrying broker-dealers' public customer accounts.[1007] In order to estimate the number of introducing broker-dealers' customers, the Commission used data from CAT during the calendar year 2021 on the number of unique customer accounts whose trades are associated with broker-dealers that do not identify as carrying their own public customer accounts in FOCUS Report Form X–17A–5 Schedule I.[1008] The resulting customer numbers

securities exchanges on the basis of fees and rebates.

[1001] Another possibility is that a reporting entity that offers inferior execution quality may try to compete on the basis of lower fees or higher rebates instead of increasing its execution quality. To the extent that this occurs, this may limit the extent to which competition would lead to improved execution quality for the customers of these reporting entities. However, these customers would still benefit from the lower fees or higher rebates.

[1002] *See, e.g., supra* note 642, describing how trading volume increased substantially for brokers after they introduced the use of fractional shares.

[1003] *See supra* note 1 defining the term ''larger broker-dealers.''

[1004] *See supra* note 166 and accompanying text discussing the proposed customer account threshold.

[1005] *See supra* section VII.D.1.(d)(1) for a discussion of the extent to which excluding smaller-brokers dealers (*i.e.,* those broker-dealers with customer accounts numbers below the customer account threshold) limits the benefits of the enhanced reporting requirements on competition for customer order flow.

[1006] *See supra* note 736 and accompanying text for a definition of carrying and introducing broker-dealers.

[1007] Specifically, item 8080 asks for information on ''respondent's total number of public customer accounts,'' but only broker-dealers that are carrying firms are requiring to answer this question, so information on introducing broker-dealers' customers is not included.

[1008] Customer accounts are identified in CAT as accounts belonging to either the ''Institutional Customer'' account type, defined as accounts that meet the definition in FINRA Rule 4512(c), or the ''Individual Customer'' account holder type, defined as accounts that do not meet the definition of FINRA Rule 4512(c) and are also not a proprietary account. *See supra* note 609 for more information about account types in CAT. Broker-dealers are identified according to their FDID as defined in section 1.1 of the CAT NMS Plan. Introducing broker-dealers are identified as those broker-dealers that report trades by customer accounts in the CAT dataset and do not identify as carrying their own public customer accounts in FOCUS Report Form X–17A–5 Schedule I. However, a customer account is only observed in this dataset if it actually traded during the sample

Continued

are then used to estimate the number of both carrying and introducing broker-dealers that would be subject to the reporting requirements of Rule 605 as proposed, using various different definitions of the customer account threshold. The estimated costs of the proposed amendments from the various definitions of the customer account thresholds are then calculated using the estimated initial and ongoing costs for new Rule 605 filers.[1009]

Lowering the customer account threshold may be beneficial if more broker-dealer customer accountholders are able to benefit from the enhanced reporting requirements. In order to estimate the benefits of different customer account thresholds, the Commission calculated the cumulative number of customer accounts (expressed as a percentage of all identified carrying and introducing broker-dealer customer accounts) associated with broker-dealers that would be subject to the reporting requirements of Rule 605 as proposed according to various definitions of the customer account threshold. Similarly, using estimates of the number of transactions associated with the broker-dealers' customer accounts, the Commission calculated the cumulative number of customer orders (expressed as a percentage of all customer orders belonging to carrying and introducing broker-dealer customer accounts) associated with broker-dealers that would be included under the various thresholds.[1010]

Table 13 presents the estimated number of broker-dealers (both carrying and introducing) that would be subject to Rule 605 reporting requirements according to different customer account thresholds, the resulting estimated costs of the proposed amendments, and the resulting estimated benefits in terms of the cumulative percentage of included customer accounts and orders. The table shows that increasing the customer account threshold from 100,000 to 500,000 would reduce the costs of the proposed amendments by around 47%, but would also result in lower coverage of customer transactions and accounts. In particular, only 6.2% of the customer transactions observed in 2021 would be included. Meanwhile, reducing the customer account threshold from 100,000 to 10,000 would almost triple both initial and ongoing costs. The amount of included transactions would increase by an additional 14.8 percentage points, which would be beneficial. However, the percentage of included customer accounts increases only marginally, by 1.2 percentage points, implying that the additional customer coverage resulting from the lower threshold is associated with only a small number of accounts that trade in large volumes. Such accounts are likely to belong to institutional traders, who are likely to have access to alternative information about the execution quality achieved by their broker-dealers and/or are likely to make use of not held orders that are excluded from Rule 605 reporting requirements, and would therefore be less likely to depend on Rule 605 reports for information about their broker-dealers' execution quality.[1011] Therefore, lowering the customer account threshold to include these customers may not be particularly beneficial, especially when compared to the substantial increase in cost.

Table 13—Cost-Benefit Analysis of Different Customer Account Thresholds Defining ''Larger Broker-Dealers''

period from January to December 2021. Therefore, to the extent that there are customer accounts that did not trade during this period, these accounts would be missing from our sample. In order to adjust for these missing accounts, an adjustment factor was constructed based on the assumption that, for carrying broker-dealers identified in both FOCUS and CAT, the number of customer accounts associated with the broker-dealer in CAT represents some percentage of that broker-dealer's total customer base available from FOCUS (*i.e.,* those customer accounts that actually traded during 2021). Dividing the number of accounts from CAT by the number of customer accounts from FOCUS reveals that, on average, around 29% of these broker-dealers' customer accounts traded during 2021. Observed customer numbers from CAT are then scaled up using the adjustment factor of 1/0.29 to estimate of the total number of customers for each broker-dealer (both carrying and introducing). In order to ensure that our estimate of customer account numbers is as conservative as possible, if a broker-dealer is observed in both datasets, the number of customers for that broker-dealer is taken as the higher of their customer account number reported in FOCUS and the adjusted number of customers estimated from CAT. Note that this method may underestimate the total number of customers to the extent that carrying broker-dealers identified in FOCUS introduce customers that they do not carry (*see supra* note 736 discussing hybrid carrying/introducing broker-dealers), and/or that introducing broker-dealers would have a higher or lower adjustment factor than carrying broker-dealers. This method may also underestimate or overestimate any particular broker-dealer's total number of customers to the extent that a larger or smaller portion of the broker-dealer's customer base traded during the sample period than the number implied by the adjustment factor. Lastly, this method may underestimate the number of customer accounts to the extent that some broker-dealers introduce customer accounts on an omnibus basis, which pool together the accounts of potentially multiple underlying customers but would only be recorded as a single account in CAT.

[1009] *See supra* section VI.D for a description of these costs. *See supra* notes 488 and 489 for initial and ongoing costs for existing respondents; and *supra* notes 491 and 492 for initial and ongoing costs for new respondents. This analysis assumes the same costs for both larger and smaller broker-dealers.

[1010] Specifically, the Commission used the total number of transactions associated with the broker-dealer customer accounts identified in CAT during calendar year 2021, along with the sum of broker-dealers' responses to items 8107 and 8108 from their 2021 FOCUS Report Form X–17A–5 Schedule I (''Number of respondent's public customer transactions: equity securities transactions effected on a national securities exchange'' and ''equity securities transactions effected other than on a national securities exchange''). *See Focus Report Form X–17A–5 Schedule I,* SEC, *available at https://www.sec.gov/files/formx-17a-5_schedi.pdf.* Note that some of these orders are likely to be excluded from Rule 605 reporting requirements to the extent that they belong to an order type or size group that is not subject to Rule 605. In order to ensure that our estimate of customer transactions is as conservative as possible, if a broker-dealer is observed in both datasets, the number of customer transactions for that broker-dealer is taken as the higher of the number of transactions as reported in FOCUS and the number of transactions observed in CAT.

[1011] *See supra* section VII.C.1.(c)(2) for a discussion of institutional investors' access to alternative sources of execution quality other than Rule 605 reports.

Customer Account Threshold	Number of Broker Dealers			Estimated Compliance Costs		Customer Transactions Included (%)	Customer Accounts Included (%)
	Carrying	Introducing	Total	Initial	Ongoing		
500,000	28	17	45	$ 1,665,900	$ 1,686,960	6.2%	96.3%
100,000	48	37	85	$ 3,146,700	$ 3,186,480	66.6%	98.5%
10,000	70	165	235	$ 8,699,700	$ 8,809,680	81.4%	99.7%
1,000	106	508	614	$ 22,730,280	$ 23,017,632	91.6%	100.0%
100	130	871	1001	$ 37,057,020	$ 37,525,488	91.8%	100.0%
10	140	1065	1205	$ 44,609,100	$ 45,173,040	100.0%	100.0%
1	157	1110	1267	$ 46,904,340	$ 47,497,296	100.0%	100.0%

Table 13: Cost-Benefit Analysis of Different Customer Account Thresholds Defining "Larger Broker-Dealers". This table presents the estimated number of broker-dealers that would be subject to Rule 605 reporting requirements according to different definitions of the customer account threshold. Customer account numbers and transaction numbers for carrying broker-dealers are estimated from 2021 FOCUS Report Form X-17A-5 Schedule I and customer account numbers and transactions numbers for introducing broker-dealers are estimated using data from CAT for calendar year 2021 (see supra note 1008 and 1010 for methodology). Costs are estimated using the per-respondent costs from section VI.D (see supra note 1009 for a description of these costs).

An indirect cost of requiring these smaller broker-dealers to publish Rule 605 reports is an increased risk of information leakage. To the extent that a broker-dealer serves multiple institutional investors and/or these institutional investors exclusively use not held orders, it would be difficult to identify the orders of a particular customer in the proposed reports. However, a smaller broker-dealer may have only a few institutional investor customers that represents the majority of its business and this may be known to other market participants. In this case, it may be possible to learn from Rule 605 reports some information about the customer's order flow that is handled by the specific broker-dealer. This information would only pertain to historical order flow and would only include a possibly limited subset of the customer's orders that are held orders, but could nevertheless provide information about the general characteristics of the customer's order flow, which may be useful to other market participants. Such a potential outcome could put smaller broker-dealers (that is, those with a small set of customers or handling a relatively small number of institutional orders) at a competitive disadvantage relative to larger broker-dealers, as institutional investors might avoid using smaller broker-dealers to avoid possible disclosure that could be traced back to the customer.

(b) Require All Broker-Dealers To Prepare Rule 605 Reports

Another alternative to the proposed amendment to require larger broker-dealers to prepare execution quality reports pursuant to Rule 605 is to require all broker-dealers to prepare such reports, excluding broker-dealers with de minimis order flow.[1012]

Expanding reporting requirements to all broker-dealers, subject to a de minimis threshold, would greatly increase the scope of the proposed amendments, as there were 3,498 registered broker-dealers as of Q2 2022.[1013] However, only around a third (specifically, 1,267) of these broker-dealers introduced or carried at least one individual and/or institutional investor in the market for NMS stocks within the sample time period.[1014] The Commission is mindful of the additional costs that broad expansion of the rule to all broker-dealers would entail, relative to the likely limited benefits of expanding reporting requirements to a substantial number of broker-dealers that do not directly handle, and thus have less discretion over the execution quality of, individual and institutional investors' orders. Therefore, the Commission believes that the increase in cost that would accompany a requirement for all broker-dealers to prepare Rule 605 reports, subject to a de minimis threshold, would not be justified by the corresponding benefit, and that limiting reporting obligations to broker-dealers that handle customer orders would focus the associated implementation costs on those broker-dealers for which the availability of more specific execution quality statistics would provide a greater benefit.

(c) Defining the Threshold for Differentiating Larger Broker-Dealers Using Number of Customer Transactions Rather Than Number of Customer Accounts

The Commission also considered defining the threshold for differentiating larger broker-dealers using number of customer transactions rather than number of customer accounts. An approach requiring that broker-dealers handling above a threshold level of customer transactions publish Rule 605 reports would likely capture an overall larger number of customer orders. However, it would also be subject to a

[1012] This alternative was suggested by EMSAC; *see supra* notes 104–106; 171 and accompanying text.

[1013] *See supra* note 735 and corresponding discussion.

[1014] *See* analysis in *supra* Table 13 for estimated number of broker-dealers that introduce or carry at least one customer account.

number of issues that would limit the benefits of this approach.

First, this approach would likely exclude from reporting requirements broker-dealers that have a large number of relatively inactive customer accounts, and include broker-dealers that have a small number of accounts associated with large amounts of trading volume. While the former are likely to be accounts belonging to individual investors, the latter are very likely to be institutional accounts. Institutional investors are likely to have access to alternative information about the execution quality achieved by their broker-dealers and/or are likely to make use of not held orders that are excluded from Rule 605 reporting requirements, and would therefore be less likely to depend on Rule 605 reports for information about their broker-dealers' execution quality.[1015] Meanwhile, individual investors have few alternatives other than Rule 605 for information about the execution quality achieved by their broker-dealers.[1016] Therefore, while expanding overall coverage, defining the threshold using the number of customer transactions would be less likely to target the types of orders that may be most useful for consumers of Rule 605 reports.

Secondly, defining the threshold using the number of customer transactions may result in a less stable classification of broker-dealers into those that are and are not subject to Rule 605 requirements, as there is likely to be more month-to-month variation in transaction numbers resulting from changes in market conditions, as compared to number of customer accounts.[1017] This could potentially be disruptive to broker-dealers to have to coordinate compliance with the Rule during some periods but not others and interfere with customers' or market participants' ability to look at a broker-dealer's execution quality over time by analyzing historical data. Furthermore, the dependence of transaction volumes on market conditions may result in broker-dealers being newly defined as ''larger broker-dealers'' subject to reporting requirements, even though their size relative to other broker-dealers did not change. For example, a period of sustained market volatility resulting in overall increases in market activity levels may trigger the need for many or even most broker-dealers to file Rule 605 reports, even if the broker-dealer's relative portion of order flow (as a percentage of total broker-dealer customer order flow) did not change.[1018] This would increase the total compliance costs associated with the proposed amendments.

Lastly, the number of customer accounts is likely less costly for broker-dealers to calculate and track compared to the number of transactions associated with customer accounts. Given that only 41.1% of customer-carrying broker-dealers report the actual number of their customer transactions (rather than an estimated number) on their FOCUS Report Form X–17A–5 Schedule I,[1019] the extent to which broker-dealers currently are able or choose to track the number of transactions associated with their customer accounts is unclear.

2. Reasonable Alternative Modifications to Scope of Covered Orders

(a) Explicitly Include ISO Orders With Limit Prices Inferior to the NBBO

Currently, marketable Intermarket Sweep Orders (''ISOs'') with a limit price inferior to the NBBO, *i.e.,* an ISO with a limit price less than the national best bid for sell orders or higher than the national best offer for buy orders, may be viewed as being subject to special handling, which would exclude them from Rule 605 reports.[1020] One alternative could be to explicitly include these orders within the scope of covered orders, either aggregated with other orders types or as a separate order type category.

ISOs make up a large percentage of on-exchange trade volume; one academic working paper found that, between January 2019 and April 2021, ISOs accounted for 48% of on-exchange trade volume.[1021] In order to estimate the volume of ISOs that are excluded from Rule 605 reporting requirements as a result of the exclusion of ISOs with inferior limit prices, an analysis was performed using data on ISO marketable limit orders from the Tick Size Pilot B.II Market and Marketable Limit Order dataset.[1022] Table 14 shows that ISO orders with limit prices inferior to the NBBO make up 4.9% of ISO buy orders (6.3% of buy share volume), and 4.7% of ISO sell orders (9.0% of ISO sell volume). Therefore, it could be the case that these orders make up a small but non-negligible percent of order flow.[1023]

TABLE 14—MARKETABLE INTERMARKET SWEEP ORDERS BY PRICE RELATIVE TO NBBO, MARCH 2019

	ISO buy orders (percent)	ISO sell orders (percent)
Percent of Orders:		
Price Equal to the NBBO	95.1	95.2
Price Worse Than NBBO	4.9	4.7
Price Better Than NBBO	0.05	0.06
Percent of Share Volume:		
Price Equal to the NBBO	93.5	90.1
Price Worse Than NBBO	6.3	9.0

[1015] *See* section VII.C.1.(c)(2) for a discussion of institutional investors' access to alternative sources of execution quality other than Rule 605 reports.

[1016] *See* section VII.C.1.(c)(1) for a discussion of individual investors' usage of Rule 605 reports.

[1017] Note that this possibility is somewhat limited by the proposal that a broker or dealer that equals or exceeds the customer account threshold would be required to provide reports for at least three calendar months. *See supra* note 183 and corresponding discussion.

[1018] Note that this possibility would be somewhat limited by the proposal to only require broker-dealers to publish Rule 605 reports after a three-month initial grace period. *See supra* note 186 and corresponding discussion.

[1019] *See supra* note 168 for a description of FOCUS Report Form X–17A–5 Schedule I.

[1020] *See supra* notes 36–37, discussing the exclusion of orders for which the customer requests special handling from the definition of ''covered orders''. *See also* 2013 FAQs, answer to Question 1.

[1021] *See* Ariel Lohr, *Sweep Orders and the Costs of Market Fragmentation* (Sept. 18, 2021), *available at https://ssrn.com/abstract=3926296* (retrieved from SSRN Elsevier database).

[1022] *See supra* note 723 for dataset description. For the analysis of ISO orders, the Commission limited this analysis to a randomly selected sample of 100 stocks and for the time-period of March 2019.

[1023] As the Tick Size Pilot covered only small-cap stocks (*i.e.,* NMS common stocks that have a market capitalization of $3 billion or less, a closing price of at least $2.00, and a consolidated average daily volume of one million shares or less), ISO volumes and properties may be different for mid- or large-cap stocks. Furthermore, as the Tick Size Pilot data is based on self-reported data by trading centers, there is the possibility that the data may be subject to certain errors or omissions.

TABLE 14—MARKETABLE INTERMARKET SWEEP ORDERS BY PRICE RELATIVE TO NBBO, MARCH 2019—Continued

	ISO buy orders (percent)	ISO sell orders (percent)
Price Better Than NBBO	0.2	0.9

Table 14: Marketable Intermarket Sweep Orders by Price Relative to NBBO, March 2019. This table shows the percentage of ISO marketable limit orders with limit prices inferior to the NBBO, equal to the NBBO, and better than the NBBO, using a randomly selected sample of 100 stocks from the Tick Size Pilot B.II Market and Marketable Limit Order dataset and for the time period of March 2019. *See supra* note 723 for dataset description. The numbers reported here, in particular those related to the NBBO, may change once the amendments in the MDI Adopting Release are implemented. *See supra* note 613 and section VII.C.1.(d)(2).

However, there are questions as to whether ISOs with inferior limit prices would be comparable to other marketable limit orders. When the limit price of an ISO is inferior to the NBBO at time of order receipt, the customer is effectively instructing the trading center that it can execute the order at a price inferior to the NBBO. If the order executes, any adverse effects that this inferior limit price has on the order's execution quality metrics (*e.g.,* a negative price improvement, or a higher effective spread) would be a result of the customer's instructions, rather than the market center or broker-dealer's discretion. As a result, these orders are likely to skew execution quality metrics downwards if included with other order types, which would harm market participants' ability to use these metrics to accurately compare reporting entities.

One alternative could be to explicitly include ISOs with inferior limit prices as a separate order type category in Rule 605 reports. However, the instruction that a market center should execute an ISO order at a price inferior to the NBBO, even when other market centers are displaying liquidity at better prices, limits broker-dealers' discretion over the execution price of these orders. Thus, market participants may only benefit from this information to the extent that market centers or broker-dealers still have some discretion over some dimension of the order's execution quality such that this information would be useful in comparing metrics across reporting entities. For example, the willingness of traders to accept prices worse than the NBBO could help illuminate the premium paid by traders to quickly trade in a fragmented trading environment, which could differ across market centers.

(b) Exclude Orders That Are Cancelled Quickly After Submission

Limit orders that are canceled within a very short amount of time after submission are likely driven by trading strategies (for example, high frequency trading [1024] and ''pinging'') that are not intended to provide liquidity, and therefore may have limited information about the execution quality of a particular market center. Excluding quickly cancelled orders from the definition of covered orders may allow fill rates (*i.e.,* number of shares executed at or away from the market center, divided by number of covered shares) to better capture the execution probability of resting orders that are given a minimum opportunity to be executed, leading to a more meaningful ranking of Rule 605 reporting entities. At the same time, excluding cancelled orders also may entail losing important information if these cancellations capture information about orders that did not or could not receive a fill, rather than trading strategies.

In order to examine how the presence of quickly cancelled orders may impact fill rates and subsequently impact the ranking of market centers, the Commission first examined data on cancellation and execution times of executable NMLOs from MIDAS during the month of March 2022.[1025] Figure 16 plots the conditional distribution of cancellation and execution times,[1026] and shows that cancellation times tend to be shorter than execution times: while the largest percentage (29.8%) of cancelled executable NMLOs are cancelled between 1 and 100 milliseconds after submission, the largest percentage (44.8%) of executable NMLOs that received execution are not executed until between 1 and 30 seconds after submission. In fact, while 75% of cancelled orders are cancelled in less than 1 second, only 41.1% of executions happen within the same time frame. This imbalance implies that many orders may be cancelled before they are given a reasonable opportunity to execute.

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Figure 16: Distribution of Execution and Cancellation Times for Executable NMLOs, March 2022

[1024] The Concept Release on Equity Market Structure states that ''the submission of numerous orders that are cancelled shortly after submission'' is a primary characteristic of high-frequency traders. *See* 75 FR 3594 (Jan. 21, 2010) at 3606.

[1025] *See supra* note 634 for data description. Note that this analysis doesn't include IOC NMLOs, which are not captured in MIDAS metrics. As discussed in *supra* section VII.C.2.(c)(7), these orders may also contribute to low fill rates in Rule 605 reports.

[1026] Note that the conditional distribution examines the percentage of cancelled (executed) orders that are cancelled (executed) within the defined time thresholds, and not the percentage of all orders that are cancelled or executed within the defined thresholds. Therefore, the cancellation (execution) percentages plotted in the Figure should sum up to 100%.

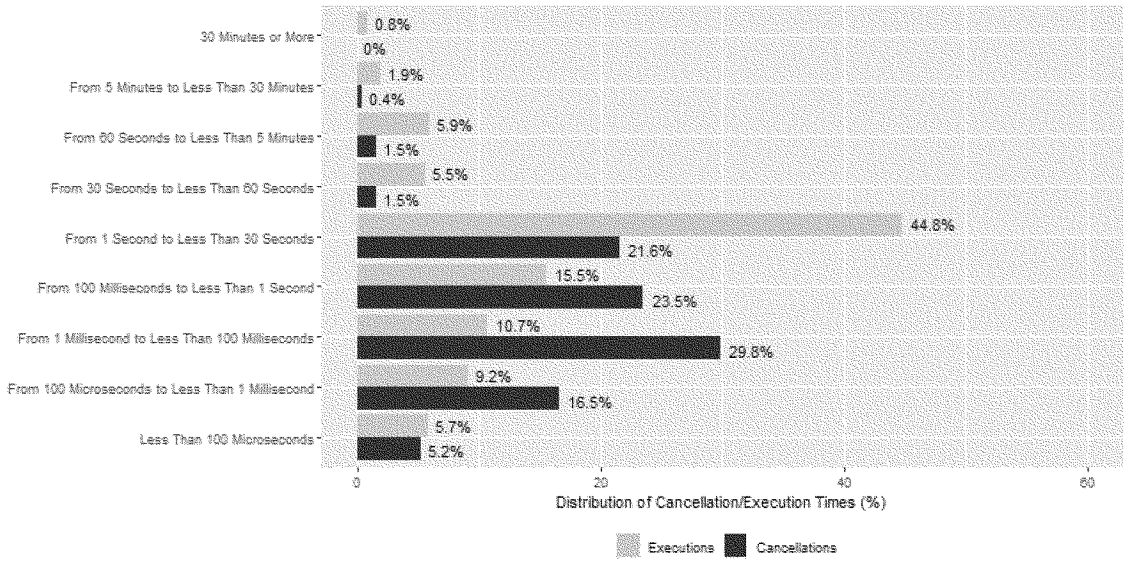

Figure 16: Distribution of Execution and Cancellation Times for Executable NMLOs, March 2022. This figure plots the distribution of execution and cancellation times across various time categories, using data from MIDAS. See supra note 634 for data description.

Therefore, it may be the case that excluding orders cancelled below some minimum threshold may lead to more informative fill rates. However, one question might be how to determine this threshold. For example, if the intent is to exclude cancellations that are part of high-frequency trading strategies such as pinging, it may be useful to keep in mind that estimates of human reaction time range from between one second and several hundred milliseconds, setting an upper bound for what might be considered high-frequency trading.[1027] Meanwhile, one recent academic paper found that high frequency trading strategies operate in approximately 5 to 10 microseconds.[1028] This would imply that a useful range for determining an appropriate threshold might be between approximately a few microseconds and one second. Figure 17 plots the fill rates of executable NMLOs that result from excluding orders that are cancelled below a variety of minimum time thresholds, showing that fill rates increase and approach 100% as more and more cancelled orders are excluded from the calculation of the fill rate. Importantly, fill rates do not change much when orders cancelled in less than 100 microseconds, only increasing by 0.2%. Fill rates increase substantially when orders cancelled in less than 1 second are excluded, but still remain on the lower side at 11.5%. This implies that the impact of excluding quickly cancelled orders on fill rates may be limited.[1029]

Figure 17: Effect of Excluding Quickly Cancelled Orders on Fill Rates for Executable NMLOs, March 2022

[1027] *See, e.g.,* Neil Johnson, Guannan Zhao, Eric Hunsader, Hong Qi, Nicholas Johnson, Jing Meng & Brian Tivnan, *Abrupt Rise of New Machine Ecology Beyond Human Response Tim*e, 3 Sci. Reps. 1 (2013); Albert Menkveld & Marius A. Zoican, *Need for Speed? Exchange Latency and Liquidity,* Rev. Fin. Stud. 1188 (2017).

[1028] *See* Matteo Aquilina, Eric Budis & Peter O'Neill, *Quantifying the High-Frequency Trading ''Arms Race,* 137 Q. J. Econ. 493 (2022).

[1029] Note that this sample contains a mixture of stocks in terms of share price and market capitalization, and these numbers are likely to look different for individual stocks according to their market capitalization and liquidity characteristics.

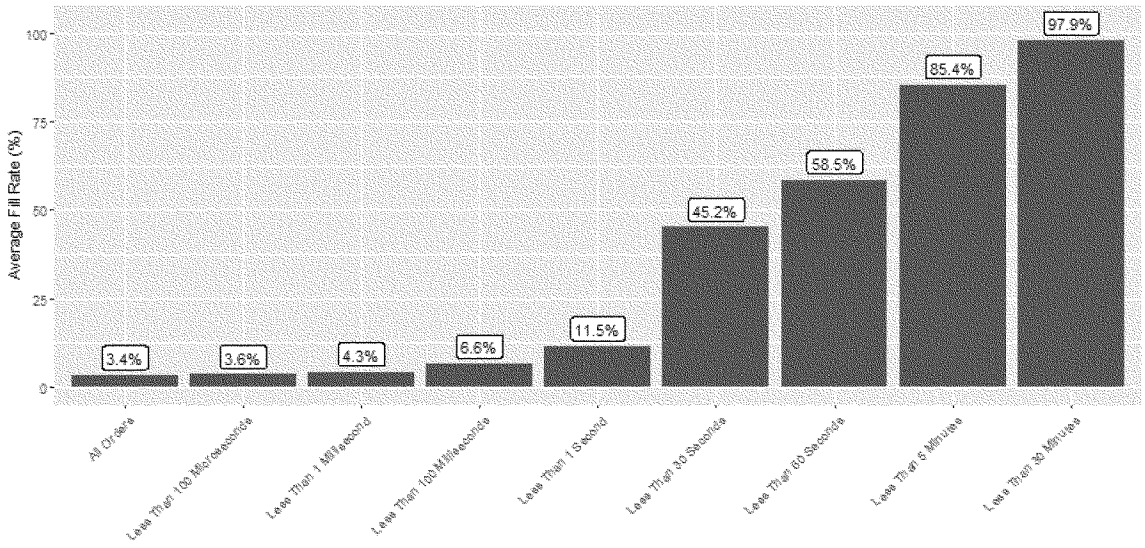

Figure 17: Effect of Excluding Quickly Cancelled Orders on Fill Rates for Executable NMLOs, March 2022. This figure plots the fill rates of executable NMLOs that result from excluding orders that are cancelled below a variety of minimum time thresholds using data from MIDAS. See supra note 634 for data description.

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The benefit of excluding quickly cancelled orders is also likely to be limited if excluding these orders systemically increases fill rates across all reporting entities and does not necessarily lead to a change in ranking between reporting entities. To explore this possibility, the Commission limited the sample to the five largest market centers in terms of execution volume, to examine how the rankings between these market centers changes in terms of their fill rates for executable NMLOs resulting from changes to the threshold below which to exclude cancelled orders. Then it examined changes to their fill rate rankings for executable NMLOs as the threshold below which to exclude cancelled orders increased. The Commission found that market centers' rankings did not change until cancellations below one second were excluded, when the market centers ranked first and third switched places. As for reasons described above one second represents a maximum bound on a reasonable threshold for excluding cancellations, this again implies that the benefits of excluding quickly cancelled orders on fill rates may be limited.

(c) Include NMLOs Submitted Outside of Regular Trading Hours as a Separate Order Category

The Commission is proposing to include NMLOs submitted outside of regular trading hours if they become executable during regular trading hours into the scope of covered orders. If NMLO orders submitted outside of regular trading hours have characteristics that are fundamentally different from other types of orders and have sufficient volume such that their inclusion along with other orders may skew execution quality statistics, it may be useful to include these orders are a separate order type category in Rule 605 reports. Pre-open orders likely have characteristics that differ from orders submitted during regular hours.[1030] However, these pre-open orders make up only a very small percentage of order volume, representing only around 4.8% of the volume of orders submitted during a single ten-minute period of the trading day. Therefore, it is unlikely that the inclusion of these orders along with other order types would significantly skew execution quality statistics, and including them as a separate order type category would likely only increase the complexity and size of Rule 605 report files.

3. Reasonable Alternative Modifications to Required Information

(a) Reasonable Alternative Order Size Categories

(1) Defining Order Sizes Based on Dollar Volume Categories Rather Than Number of Round Lots

Instead of redefining order size categories according to number of round lots, one alternative would be to redefine categories based on the dollar value of the order. This approach has several advantages. First, similarly to defining categories based on numbers of round lots as in the current proposed amendments, notional size buckets based on orders' dollar values may make it easier to compare execution quality metrics across market centers that may trade in differently priced stocks. Pre-controlling for the stock price would thus eliminate the need for users of Rule 605 to go through the extra step of collecting and controlling for stock price information before being able to meaningful compare market centers using Rule 605 data. Secondly, unlike categories based on numbers of round lots, which according to the MDI Rules are based on the previous month's trading price,[1031] categories based on dollar volumes incorporate information about changing stock prices in real time, thereby better grouping together similarly sized orders, *e.g.,* stocks that experience a large price increase or drop within a single month.

On the other hand, while remaining in the spirit of distinguishing between ''small'' and ''large'' orders, defining order size buckets according to dollar values would no longer produce a meaningful distinction between round lot and odd-lot orders according to the

[1030] *See supra* section VII.D.1.(a)(2)(a) for an analysis showing that orders submitted pre-open tend to be larger and further away from the midpoint as compared to orders submitted during regular opening hours.

[1031] *See supra* note 265 and accompanying text.

new definitions under the MDI Rules, so it would not be possible to distinguish orders that may not be at quotes protected under Rule 611. Therefore, it is not clear that defining order size categories in terms of dollar values is superior to defining them by number of round lots as is currently proposed.

(b) Reasonable Alternative Time-to-Execution Statistics

(1) Increase the Granularity of Time-to-Execution Buckets

One alternative to eliminating time-to-execution buckets would be to redefine the time-to-executions to have a granularity that better suits the speed of modern markets. Time-to-executions for both marketable and non-marketable order types calculated using the Tick Size Pilot B.II dataset was analyzed,[1032] and Figure 12 shows execution speeds of market and marketable limit orders, along with the three categories of non-marketable limit orders currently required in Rule 605 (inside-the-quote, at-the-quote, and near-the-quote).

The figure shows that, for market and marketable limit orders, time-to-execution speeds are mostly bunched up at the fastest end of their time buckets, and the longer time-to-execution buckets are left virtually empty. However, the figure shows a very different picture for NMLOs, in particular for at-the-quote and near-the-quote limit orders. In contrast to market and marketable limit orders, a vast majority of these orders are executed in over one second.

While the proposed amendment to include only NMLOs that eventually touch the NBBO could cause average execution speeds to differ between Rule 605 and that of the Tick Size Pilot, *e.g.,* by excluding some NMLOs with very long execution times, virtually all of the orders in the at-the-quote category would by definition be included within the proposed new scope of executable NMLOs. These orders also have a very different distribution of time-to-executions compared to that of market and marketable limit orders. Therefore, the granularity of time-to-execution that would be granular enough to usefully capture the execution speeds of market and marketable limit orders would likely be too granular to capture the execution speeds of non-marketable limit orders. One solution might be to define two different sets of time-to-execution buckets: one for market/marketable orders, and one for non-marketable limit orders. However, this would likely increase the complexity of reporting requirements.

(c) Reasonable Alternative Spread Measures

(1) Use Different Clock Time Horizons To Calculate Realized Spread

The Commission is proposing to require the realized spread to be calculated at both 15 seconds and one minute time horizons. The Commission also considered alternative time horizons. An ideal measurement horizon would be one that aligns with the amount of time an average liquidity provider holds onto the inventory positions established from providing liquidity.[1033] Selecting an appropriate time horizon to calculate the realized spread is important, as realized spreads vary significantly as the time horizon is changed, as well as according to stock characteristics, such as size.[1034]

An analysis of variations in realized spreads calculated over time horizons ranging from 1 second to 5 minutes, as well as how they differ based on stock size, generally showed that, by the 1-minute horizon, realized spreads captured the majority of the information contained in realized spreads for all stocks, and a substantial majority for the two groups of larger stocks.[1035] However, while increasing the time horizon from 1 minute to 5 minutes has only a minimal impact on realized spreads for larger stocks, for the two smaller-stock groups, a sizeable proportion of the overall decline (37%) does not occur until the 5-minute horizon. Therefore, it may be that retaining a 5-minute horizon, in addition to the proposed 1-minute and 15-second horizon, would capture additional information about realized spreads, particular for the smallest stocks. However, requiring an additional specification of realized spreads would entail adding another data item, which would also increase the complexity of Rule 605 reports and thereby add to the costs that market participants face when collecting, interpreting, and evaluating Rule 605 reports.[1036] Given that more than 50% of the variation in realized spreads is already captured by the 1-minute horizon, the Commission does not believe that this additional cost would be justified by the benefit of requiring an additional specification for realized spreads.

(2) Use Trade Time Horizons To Calculate Realized Spread

The Commission also considered whether the time horizon used to calculate realized spreads should be measured in terms of ''trade time,'' rather than ''clock time.'' An ideal measurement horizon for realized spreads would be one that aligns with the amount of time an average liquidity provider holds onto the inventory positions established from providing liquidity. As discussed above, one would expect that this horizon varies according to characteristics that impact liquidity providers' ability to turn over their positions, including stock characteristics such as size as described above; however, this time horizon also varies over time, as overall market conditions change. The use of a fixed time horizon could therefore make it so that the ability of realized spread measures to capture information about adverse selection varies over time.

Instead of setting a fixed ''clock time'' horizon, volume or ''trade time'' measures changes between the ''the initial trade to the *i*th trade thereafter,'' [1037] and therefore allows for a time horizon that is flexible to different levels across stocks, and also over different time periods. In other words, while prices may update under liquid conditions in a few seconds or less, during very illiquid conditions several minutes may go by without a trade. Measuring time in terms of number of trades allow for the horizon to match these different speed ''regimes'' and may result in realized spread calculations that are more consistently relevant.[1038]

However, the Commission is mindful of the additional computational resources that would be required if trade time were required to calculate realized spreads, as it would require reporting entities to match their execution information both to information on the NBBO, as would be necessary under the proposed clock time horizons, but additionally historical trade information from the exclusive SIPs.[1039] More computationally intensive metrics would likely increase reporting entities' compliance costs. Therefore, the Commission believes that the proposed amendment to include multiple fixed time horizons (15 seconds and 1 minute) would allow for sufficient

[1032] *See supra* note 723 for dataset description.

[1033] *See supra* section IV.B.4.

[1034] *See supra* Figure 1.

[1035] *See supra* Table 1.

[1036] *See supra* section VII.C.2.(d) discussing search costs related to Rule 605 reports.

[1037] *See* Conrad and Wahal at 241.

[1038] For this reason, some academic studies use of trade time instead of clock time when calculating metrics; *see, e.g.,* David Easley, Marcos M. Lopez De Prado & Maureen O'Hara, *Flow Toxicity and Liquidity in a High-Frequency World,* 25 Rev. Fin. Stud. 1457 (2012).

[1039] *See supra* note 195.

flexibility in capturing realized spread information for stocks and/or time periods with different liquidity characteristics without increasing the computational resources required to calculate this measure.

(3) Use Weighted Midpoint To Calculate Effective and Realized Spread

Rule 600(b)(9) currently defines effective spreads as, for buy orders, double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at the time of order receipt and, for sell orders, as double the amount of difference between the midpoint of the national best bid and national best offer at the time of order receipt and the execution price.[1040] The Commission is further proposing to add a definition of the average percentage effective spread, which would be equal to the share-weighted average of effective spreads, divided by the midpoint.[1041] However, an academic study [1042] found that measuring the effective spread relative to the midpoint overestimates effective spreads by an average of 13%–18%, and that the bias can vary across stocks, trading venues, and investor groups. The paper instead suggests measuring effective spreads relative to a weighted midpoint, which factors in the depth available at the best bid and ask price, in order to reduce this bias.[1043]

The presence of bias in effective spreads in Rule 605 reports would impact market participants' ability to use this metric to make comparisons across reporting entities, particularly if the bias leads to a systematic over- or under-estimation of spreads for a particular entity or group of entities. However, there are benefits and costs to the use of the midpoint compared to the weighted midpoint for calculating effective spreads. On the one hand, the midpoint requires only data on the best available bid and ask price. Calculating the weighted midpoint on the other hand would require that reporting entities additionally collect data on the depth available at the NBBO.[1044] Furthermore, the midpoint may be easier to compute and interpret, as it is more familiar to market participants than the weighted midpoint.

(d) Reasonable Alternative Size Improvement Measures

(1) Allow Market Centers To Voluntarily Report ''Real Price Improvement'' Measures

The Commission considered alternative measures of size improvement, including a measure of ''real price improvement'' (''RPI''), which the petitioner suggested would take into account the depth available at market quotes.[1045] RPI is calculated as the signed difference between the transaction price and a reference price calculated as the value-weighted average price that the trader would have gotten from walking a consolidated limit order book consisting of displayed liquidity from all national securities exchanges, taking into account both odd-lots and depth available at prices outside of the NBBO. In other words, it calculates how much money a trader saved by the market center executing their trade at a particular price, rather than having their order walk the consolidated limit order book.

As the calculation of RPI takes into account the complete set of information related to the consolidated depth of book, RPI may be a more informative measure of size improvement than a measure that can be calculated using the benchmark metric [1046] proposed to be required by Rule 605, such as the size enhancement rate,[1047] which only includes information about depth at the best displayed prices. However, as the complete set of consolidated depth of book information is not available from public data sources, the RPI would require reporting entities to subscribe to all national securities exchanges' proprietary depth-of-book data feeds, which would entail a significant cost for those reporting entities that do not already subscribe to these feeds.[1048] This could make it so the benefits to market participants from having access to a potentially more accurate measure of size improvement are not justified by these additional costs to reporting entities of needing to subscribe to national securities exchanges' proprietary data feeds.

In order to compare the extent to which RPI and the size enhancement rate contain similar information about size improvement, staff used data from the Tick Size Pilot B.II Market and Marketable Limit Order dataset [1049] to calculate the average correlation [1050] between these two measures. Similar to the analysis in Table 8 examining whether price improvement and size improvement measures contain different information, staff also calculated the average correlation between RPI, price improvement and effective spreads, to confirm that this measure of size improvement contains different information than the metrics that are already included in Rule 605 reporting requirements. As in Table 8, the analysis is performed separately for national securities exchanges and off-exchange market centers.

Results are presented in Table 15 and show that RPI and price improvement are relatively strongly correlated for both national securities exchanges and off-exchange market centers, implying that these measures contain some (but not all) of the same information about execution quality. Similarly, there is moderate correlation between RPI and effective spreads, implying that these measures are somewhat overlapping in terms of their information about execution quality for both types of market centers. This confirms the results from Table 8 that measures of size improvement contain information that is currently missing from Rule 605 reports. In terms of the extent to which RPI and the size enhancement rate contain the same information about size improvement, the Commission found that there is a moderate level of correlation between RPI and the size enhancement rate (18.4% for exchanges and 22.7% for off-exchange market centers).

[1040] *See* 17 CFR 242.600(b)(8).

[1041] *See* proposed Rule 600(b)(11).

[1042] *See* Björn Hagströme, *Bias in the Effective Bid-Ask Spread,* 142 J. Fin. Econ. 314 (2021).

[1043] *See supra* note 419 for a precise definition of the weighted midpoint.

[1044] Note that this may not be a significant cost, as reporting entities are required to collect information on NBBO depth for computing the size improvement benchmark measure under the proposed amendments. *See supra* section IV.B.4.(e).

[1045] *See supra* note 411 and accompanying text.

[1046] *See supra* section IV.B.4.(e) for more information about this benchmark.

[1047] *See supra* note 884 for information about how the size enhancement rate is constructed.

[1048] In a white paper, one market center estimated its costs related to subscribing to depth of book data feeds for 11 national securities exchanges to be between $51,480 and $226,320 per exchange per year. *See The Cost of Exchange Services: Disclosing the Cost of Offering Market Data and Connectivity as a National Securities Exchange,* IEX (Jan. 2019), *available at https://iextrading.com/docs/T The%20Cost%20Tof%20Exchange%20Services.T pdf.*

[1049] *See supra* note 882 for dataset description. This analysis uses data from prior to the implementation of the MDI Rules and the specific numbers may be different following the implementation of the MDI Rules. However, it is unclear whether or how these effects would impact the correlations between these measures documents in this analysis. *See supra* note 882 and section VII.C.1.(d)(2).

[1050] *See supra* note 883 for a description of how average correlations are calculated.

TABLE 15—AVERAGE CORRELATION BETWEEN MEASURES OF PRICE AND SIZE IMPROVEMENT

Correlations	National securities exchanges (percent)	Off-exchange market centers (percent)
RPI and Price Improvement	42.1	37.2
RPI and Effective Spreads	17.1	25.8
RPI and Size Enhancement Rate	18.4	22.7

Table 15: Average Correlation between Measures of Price and Size Improvement. This table presents correlations between three measures of price improvement and size improvement: price improvement, calculated as the signed difference between the execution price and the NBBO, the effective spread, calculated as twice the signed difference between the execution price and the NBBO midpoint, and the size enhancement rate, calculated as the size improvement share count divided by the benchmark share count (*see supra* note 884 for a detailed description of this measure). *See supra* note 882 for dataset description and *supra* note 883 for methodology. This analysis uses data from prior to the implementation of the MDI Rules and specific numbers may be different following the implementation of the MDI Rules. *See supra* note 882 and section VII.C.1.(d)(2).

Given that correlation levels between these two measures are only moderate, the implication is that RPI does contain information that is not contained by the proposed benchmark metric. However, even though RPI may be a more informative measure of size improvement, it is not clear that the cost of requiring reporting entities to have access to full set of consolidated depth information would justify the benefit to market participants of having access to this additional information about size improvement. If not, the proposed amendment to include the benchmark consolidated reference quote size, capped at the size of the order, in Rule 605 reporting requirements would still be a reasonable proxy for size improvement.

One alternative might be to add a field to Rule 605 reports for real PI, but allow reporting entities to voluntarily report this measure if they subscribe to the full set of proprietary data feeds and thus have access to the complete set of consolidated depth information. Note that the requirements would need to specify that only firms that subscribe to the full set of proprietary data feeds could report this measure, as an incomplete set of information about availability liquidity at market prices would systematically overstate any size improvement measure.

4. Reasonable Alternative Modifications to Accessibility

(a) Require a System for the Centralized Posting of Rule 605 Reports

Instead of or in addition to having market centers and larger broker-dealers post Rule 605 reports to their websites, the Commission could require Rule 605 reports be submitted to a centralized electronic system, which would then make these reports available to market participants. Compared to the proposed amendments, requiring the creation of a centralized electronic system for Rule 605 reports would promote even greater transparency by better enabling market participants to access and evaluate the reports of multiple (or even the complete set of) reporting entities for the purposes of comparison. Market participants may currently face search costs when collecting existing Rule 605 reports in order to compare execution quality across reporting entities, in particular when collecting Rule 605 reports for multiple entities and across longer time periods.[1051] A centralized electronic system for Rule 605 reports would make it easier for market participants to collect and aggregate data in order to compare reporting entities as the reports would be available at a single central location. Compared to the proposed amendments, which maintain the existing requirement to disseminate Rule 605 reports on a website, the creation of a centralized electronic system would lower these search costs. Such search costs would likely increase under the proposed amendments, which would increase the number of reporting entities from 236 to 359, including 85 broker-dealers that introduce or carry 100,000 or more customer accounts.[1052] The creation of a centralized electronic system would reduce these search costs by making it easier for market participants to locate Rule 605 reports, as well as to collect subsets or even the complete set of Rule 605 reports for the purpose of comparisons.

The creation of a centralized electronic system would also promote greater transparency as compared to the proposed amendments by reducing these search costs and increasing the accessibility of Rule 605 reports by ensuring that all reports are able to be obtained from a single location. As a result of this increase in transparency, investors would be better able to use Rule 605 reports to compare execution quality across larger broker-dealers, which would increase the extent to which broker-dealers would need to compete on the basis of execution quality. Likewise, compared to the proposed amendments, broker-dealers would be better able to use Rule 605 reports to compare execution quality across market centers, increasing the extent to which market centers compete on the basis of execution quality in order to attract order flow. Requiring a centralized electronic system would also enable programmatic checks that the Rule 605 reports are appropriately standardized, formatted, and complete before posting, potentially reducing processing costs for users. The Commission recognizes that the entity responsible for administering the Rule 605 centralized electronic system would incur compliance costs as a result of the creation and maintenance of such a system (including any programmatic formatting, completeness, and/or consistency checks on the reports before posting), which could be passed on to reporting entities in the form of filing fees and/or to consumers of Rule 605 reports in the form of access fees. However, to ensure that Rule 605 reports continue to be freely available, the current requirement for reporting entities to post a free version of the report on their websites (incorporating any corrections made pursuant to any aforementioned programmatic formatting, completeness, and/or consistency checks on the reports) could be retained along with the additional

[1051] *See supra* section VII.C.2.(d) for a discussion of the current search costs associated with collecting a complete or mostly complete set of Rule 605 reports to, for example, select the reporting entity offering the best execution quality in a given stock. *See also supra* section VII.D.1.(d)(3) for a discussion of how these search costs may increase as a result of an increase in the number of Rule 605 reporting entities under the proposed amendments.

[1052] *See supra* note 486 and accompanying text for a discussion of the estimated number of reporting entities under the proposed amendments. *See also supra* section VII.D.1.(d)(3) for a discussion of how the increase in reporting entities under the proposed amendments may increase search costs for some market participants.

requirement for reports to be made available through a centralized electronic system.[1053]

Furthermore, to the extent that the centralized electronic system would include programmatic formatting, completeness, and/or consistency checks on Rule 605 reports before accepting them, reporting entities would also incur costs to resolve any issues detected by such checks. Reporting entities would be most efficiently situated to remedy any identified issues in their own reports before they are posted.

The Commission has specifically considered two options for how to implement the centralized electronic system: using the existing Rule 605 NMS Plan and the Commission's Electronic Data Gathering, Analysis, and Retrieval (''EDGAR'') system. Table 16 summarizes the costs and benefits of each of these alternatives, which are also discussed in more detail in the sections below. The Commission acknowledges there may be other options for a centralized system and requests comment on these other options.

TABLE 16—SUMMARY OF COSTS AND BENEFITS OF ALTERNATIVE CENTRALIZED ELECTRONIC SYSTEMS

Mechanism for centralized posting of reports	EDGAR	NMS plan
Benefits Relative to Proposed Amendments		
Accessibility	Reports would be in one place, reducing search costs and increasing the benefits of Rule 605 reporting. EDGAR could include programmatic checks to ensure the reports are appropriately standardized, formatted, and complete before posting, potentially reducing processing costs for users. EDGAR functionality would allow consumers to search for specific reports or all reports for a given month. However, consumers wishing to combine reports for analysis would need to pull each report separately. EDGAR does not charge access fees.	Reports would be in one place, reducing search costs and increasing the benefits of Rule 605 reporting. The NMS Plan could include programmatic checks to ensure the reports are appropriately standardized, formatted, and complete before posting, potentially reducing processing costs for users. However, the specific functionality and ease of access is uncertain. Any access fees could limit benefits.
Costs Relative to Proposed Amendments		
Costs to Build	n/a	Plan participants would incur costs to build a system to collect and validate or to contract with someone who already has a system that could work.
Costs to Maintain	n/a	Plan participants would incur the cost of maintaining a reporting system.
Reporting Costs	Reporting entities that do not already submit documents to the Commission via EDGAR would incur a one-time burden to obtain EDGAR access codes. Reporting entities would incur costs if their reports contain formatting, completeness, or consistency issues that would require resolution before acceptance. EDGAR does not charge filing fees.	Reporting entities could pay a reporting fee to cover the costs of the Plan participants. Reporting entities would incur costs if their reports contain formatting, completeness, or consistency issues that would require resolution before acceptance.
Coordination Costs	n/a	Plan participants would incur costs to coordinate on amending the NMS Plan.

Table 16: Summary of Costs and Benefits of Alternative Centralized Electronic Systems. This table presents a qualitative summary of the benefits and costs that the Commission estimates would result from various alternatives requiring the centralized posting of Rule 605 reports, relative to the proposed amendments. These benefits and costs are discussed in more detail in *infra* sections VII.E.4.(a)(1)–(2).

(1) Require Rule 605 Reports To Be Provided Through the NMS Plan

One alternative would be to require that procedures established pursuant to the NMS Plan provide for the creation and maintenance of a centralized electronic system to serve as a repository for Rule 605 reports. In this alternative, the proposed rule text could specify that the NMS plan procedures shall provide for the creation and maintenance of a centralized electronic system for such reports and make such reports available for viewing and downloading in a manner that is free and readily accessible to the public. However, the rule text could retain existing language such that, in the event there is no plan or system currently establishing such procedures, reports shall be prepared in a consistent, usable, and machine-readable electronic format and be made available for downloading from an internet website that is free and readily accessible to the public.[1054] In other words, in the absence of procedures providing for the creation and maintenance of a centralized electronic system, Rule 605 reports are required to be made available for download from an internet website that is free and readily accessible to the public (or as specified by the then-current NMS plan). This backstop requirement will help to assure the continued availability of execution quality information while a centralized electronic system is developed.

As discussed above, the creation of a centralized electronic system would generally result in additional economic benefits as compared to the proposed amendments by further promoting transparency and competition, and by reducing market participants' search costs by ensuring that all Rule 605 reports could be obtained from a single

[1053] To the extent that potential consumers of Rule 605 reports would not access the reports as a result of a centralized electronic system's access fees, this would represent a limitation to the benefits from increased accessibility. If the number of current consumers of Rule 605 would actually decrease as a result of these potential access fees, this would represent a cost in the form of reduced accessibility of Rule 605 reports. However, maintaining the current requirement for reporting entities to post a free version of the report on their websites would obviate this cost.

[1054] *See* 17 CFR 242.605(a)(2).

location. However, as the NMS Plan would be tasked with designing and implementing the centralized electronic system, the Commission would ex ante be uncertain as to the specific functionality and ease of access that such a centralized electronic system would provide. Any differences between this alternative and any other alternative in terms of the accessibility and timeliness of centralized Rule 605 information would depend on how the NMS Plan would develop the functionality for distributing or making the Rule 605 reports public.

The Commission estimates that the NMS Plan participants, consisting of 16 national securities exchanges and 1 national securities association, would incur initial and ongoing compliance costs associated with this alternative. First, the NMS Plan participants would incur initial compliance costs associated with preparing and filing amendments to the NMS Plan to account for the creation of a centralized electronic system to make reports available for viewing and downloading, along with the implementation and enforcement of that system. The Commission estimates that there would be a one-time (or initial) burden of 65 hours per NMS Plan participant to account for the creation of a centralized electronic system.[1055] Furthermore, the Commission estimates that the NMS Plan participants would incur an ongoing, annual burden of 15 hours per NMS Plan participant [1056] associated with the maintenance of the centralized electronic system. NMS Plan participants would likely also incur coordination costs to reach an agreement on the design and implementation of a centralized electronic system. However, the Commission is unable to quantify these potential coordination costs as it would depend on the extent to which there would be disagreements among the NMS plan participants.

The Commission estimates that the above initial and ongoing burdens would result in an estimated total initial compliance cost of approximately $294,950 and a total annual compliance cost of $80,444 for all NMS Plan participants. These costs would likely be passed on to reporting entities in the form of reporting fees, or to consumers of Rule 605 reports in the form of access fees. Thus, these costs could result in an increase in the initial and ongoing compliance costs incurred by reporting entities, and/or an increase in costs or a limitation to benefits for Rule 605 consumers. As discussed above, to the extent that the centralized electronic system would include pre-acceptance checks that Rule 605 reports are appropriately standardized, formatted, and complete, reporting entities would also incur costs to resolve any issues flagged by such checks, though the specific process for resolving such issues would determine the precise costs involved.

(2) Require Rule 605 Reports To Be Provided to the Commission Through EDGAR

As another alternative, the Commission could propose to have reporting entities disclose Rule 605 information directly to the Commission through the Commission's Electronic Data Gathering, Analysis, and Retrieval (''EDGAR'') system, with the Commission subsequently making the information publicly available on EDGAR. Such an alternative would increase certain reporting entities' compliance costs relative to the proposed amendments, as any reporting entities that do not already submit documents to the Commission via EDGAR would incur a one-time burden of submitting a notarized Form ID application to obtain EDGAR access codes, a burden that would not apply under the proposed amendments.[1057] However, an EDGAR requirement would not involve any costs to NMS Plan participants of creating and maintaining an electronic system for Rule 605 reports, and, as EDGAR would not charge any reporting or access fees, would not involve the cost to reporting entities of paying reporting fees or the cost to consumers of Rule 605 reports of paying access fees.

EDGAR functionality would allow consumers of Rule 605 to search for specific reports or all reports for a given month. However, consumers wishing to combine reports for analysis would need to pull each report separately. EDGAR functionality would also allow for programmatic checks to ensure Rule 605 reports are appropriately standardized, formatted, and complete before posting; Commission staff could design and periodically assess such checks to ensure they are effective. To the extent that these checks detect any issues in Rule 605 reports before posting, reporting entities may incur costs in resolving these issues and re-submitting their reports.

Under this alternative, entities would submit Rule 605 information to the Commission, but would not file Rule 605 information with the Commission. Under the Exchange Act, documents filed with the Commission are subject to heightened liability for misstatements contained therein than documents otherwise provided to the Commission (*e.g.,* documents furnished to the Commission).[1058] Because this alternative is intended to alter the manner by which Rule 605 reports are made available, and not the liability attached to Rule 605 reports, the alternative does not contemplate filing Rule 605 information with the Commission.

(b) Require Rule 605 Reports To Be Filed Using an Expanded Version of the Rule 606 XML Schema

Rule 605 currently requires that reports be provided in a machine-readable electronic format, [1059] and the governing NMS Plan specifies that Rule 605 reports must be provided in pipe-delimited ASCII, which is a machine-readable electronic format.[1060] This would not be changed under the proposed amendments. As an alternative, the Commission could revise Rule 605 to specify that Rule 605 reports must be provided using an

[1055] The Commission believes the monetized initial burden for this requirement to be $294,950. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(Programmer Analyst at $267 for 40 hours) + (Business Analyst at $255 for 5 hour) + (Attorney at $462 for 15 hours) + (Assistant General Counsel at $518 for 5 hours)] = $17,350 per respondent for a total initial monetized burden of $365,075 ($21,475 × 17 respondents).

[1056] The Commission believes the monetized annual burden for this requirement to be $80,444. The Commission derived this estimate based on per hour figure from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by Commission staff to account for an 1,800-hour work-year and inflation, and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead: [(Attorney at $462 for 10 hours) + (Assistant General Counsel at $518 for 5 hours)] = $4,732 per respondent for a total initial monetized burden of $122,570 ($7,210 × 17 respondents).

[1057] *See* 17 CFR 232.10; section 3 of the EDGAR Filer Manual (Volume I) version 40 (June 2022). Any market centers, brokers, and dealers that already submit documents on EDGAR would not incur this burden. For example, some broker-dealers choose to file the annual audit reports required by Form X–17A–5 Part III on EDGAR rather than via paper, and would thus already have the required access and procedures in place to submit Rule 605 Reports to EDGAR. *See* section 8.2.19 of the EDGAR Filer Manual (Volume II) version 62 (June 2022).

[1058] *See* section 32 of the Exchange Act.

[1059] *See* CFR 242.605(a)(2) requiring that ''. . . market centers shall prepare their reports in a consistent, usable, and machine-readable electronic format . . .''

[1060] *See* Plan at 2 (''Section V . . . provides that market center files must be in standard, pipe-delimited ASCII format''). *See also supra* note 49 and accompanying text.

expanded version of the existing XML schema for Rule 606 reports.[1061] This alternative would allow the data on Rule 605 reports to be used interchangeably with the data in Rule 606 reports, thus facilitating the usage of Rule 605 data together with Rule 606 data, in line with the Commission's original intent for the rules.[1062] In addition, the use of XML rather than pipe-delimited ASCII would facilitate the use of more complex data error checks (such as checks on elements in nested structures).

On the other hand, this alternative would require reporting entities to establish technical systems to format the reports using the expanded XML schema and render them using the PDF renderer, thus imposing additional compliance costs relative to the baseline and the proposed amendments. Furthermore, because Rule 605 reports consist solely of a series of discrete numeric values, and do not contain elements in nested structures, the Commission does not believe the more sophisticated validations enabled by the use of XML would provide significant benefits for Rule 605 reports. In addition, because the nature of the Rule 606 data (which includes narrative discussions) differs from the nature of the Rule 605 data (which is limited to a discrete set of numerical statistics), and because the population of entities that report Rule 606 data (broker-dealers) does not coincide with the population of entities that report Rule 605 data (market centers, and, under the proposed amendments, certain broker-dealers), the Commission does not believe the benefits to be realized from interchangeable usage of Rule 605 and Rule 606 data would justify the compliance costs that would arise under this alternative.

5. Other Reasonable Alternatives

(a) Releasing Aggregated CAT Data

As an alternative to the proposed amendments, the Commission could use CAT data to have either the Commission or the CAT Plan Processor[1063] provide execution quality information to the public at monthly intervals—or more frequently. This alternative would effectively eliminate the need for Rule 605 reports.

This approach would have lower compliance costs for reporting entities than the current proposal, as it would not require reporting entities to prepare Rule 605 reports. Another benefit of this alternative with regard to the current proposal is that the data in this alternative could be more comprehensive in terms of the breadth of broker-dealers whose execution quality information could be aggregated and published, because the Commission could publish aggregated data on execution quality from all broker-dealers instead of just those that meet the customer account threshold. As a result, the data would be more comprehensive, resulting in even greater benefits from transparency.[1064]

However, it would be a major undertaking for the Plan Processor to build out and adapt systems to collect, process, and publish this information, which would increase costs associated with the Plan Processor. Costs associated with the Plan Processor would also increase as a result of increased requirements for processing power for the aggregation of CAT data if such computations could not be performed with existing resources (without reducing other functionality). Any costs incurred by the Plan Processor would be passed along to Plan Participants and Industry Members, which could result in larger costs to some reporting entities.[1065] Another drawback to this alternative is that releasing CAT data to the public could increase security risks. CAT contains highly sensitive information and creating a process that would release portions of the data, even if aggregated, could present risks.

F. Request for Comment

The Commission requests comment on all aspects of this initial economic analysis, including whether the analysis has: (1) identified all benefits and costs, including all effects on efficiency, competition, and capital formation; (2) given due consideration to each benefit and cost, including each effect on efficiency, competition, and capital formation; and (3) identified and considered reasonable alternatives to the proposed new rules and rule amendments. The Commission requests and encourages any interested person to submit comments regarding the proposed rules, our analysis of the potential effects of the proposed rules and proposed amendments, and other matters that may have an effect on the proposed rules. The Commission requests that commenters identify sources of data and information as well as provide data and information to assist us in analyzing the economic consequences of the proposed rules and proposed amendments. The Commission also is interested in comments on the qualitative benefits and costs identified here and any benefits and costs that may have been overlooked. In addition to the general request for comments on the economic analysis associated with the proposed rules and proposed amendments, the Commission requests specific comment on certain aspects of the proposed amendments to Rule 605:

56. Do commenters believe that rulemaking is necessary to provide investors with a more modernized source of standardized execution quality information than what is currently contained in Rule 605 reports? What are commenters' views on why alternative market-based sources of standardized execution quality information, such as the FIF Template, have not been more widely adopted?

57. Has the Commission accurately assessed the current usage of Rule 605 reports? Do commenters agree that broker-dealers currently use Rule 605 reports in assessing best execution? Do commenters believe that Rule 605 reports currently have low usage among individual investors? If so, why? Do commenters believe that Rule 605 reports currently have low usage among institutional investors? If so, why? What are commenters' understandings of the current availability and cost of data products and/or summary reports sourced from Rule 605 data? Does the availability and costs of such products vary depending on the type of investor that the product is targeting (*i.e.,* individual or institutional)?

58. Do market participants currently lack information about the execution quality of broker-dealers? If so, does this limit the extent to which broker-dealers must compete on the basis of execution quality? Why or why not? Do commenters believe that the ability to use information on broker-dealer routing in Rule 606 reports and

[1061] *See* 17 CFR 242.606(a)(2) and (b)(3), requiring reports to be made available ''using the most recent versions of the XML schema and the associated PDF renderer as published on the Commission's website.'' *See* also Order Routing and Handling Data Technical Specification, SEC (Feb. 25, 2022), *available at https://www.sec.gov/files/order_handling_data_technical_specification-2022-02-25.pdf.*

[1062] *See supra* note 141.

[1063] As set forth in the CAT NMS Plan, the Plan Processor is required to develop and, with the prior approval of the Operating Committee, implement policies, procedures, and control structures related to the CAT System that are consistent with 17 CFR 242.613(e)(4), and Appendix C and Appendix D of the CAT NMS Plan. *See* Joint Industry Plan; Order Approving the National Market System Plan Governing the Consolidated Audit Trail, SEC, n.136 (Nov. 15, 2016), *available at https://www.sec.gov/rules/sro/nms/2016/34-79318.pdf.*

[1064] *See supra* section VII.D.1.(a)(1)(a) for a discussion of the benefits of increased transparency from expanding reporting requirements to include larger broker-dealers.

[1065] Some reporting entities, on the other hand, may incur lower costs if they pay a smaller proportion of CAT costs.

information on market center execution quality in Rule 605 reports in order to discern the execution quality of broker-dealers currently limited? Why or why not?

59. Are commenters aware of any inconsistencies in how reporting entities separate or combine information across several market centers or business lines that they operate for the purposes of Rule 605 reporting? To the best of commenters' knowledge, is it common practice for market centers that operate SDPs to combine information about orders submitted to their SDPs with information about other orders handled by the market center for the purposes of Rule 605 reporting? Are commenters aware of any other situations in which reporting entities typically co-mingle execution quality statistics across several market centers or business lines that they operate?

60. Do commenters agree that orders submitted to qualified auctions would likely differ from other types of orders? If so, in what ways might these differences impact execution quality metrics?

61. Do commenters agree that the number of order types has increased since the early 2000s? If so, do commenters believe that a proliferation of order types has contributed to any changes in the extent to which Rule 605 reports contain information about relevant order sizes and order types? Are there any additional order types that are currently excluded from Rule 605 reporting requirements that the Commission should include?

62. Do commenters believe that a significant portion of ISO order volume may be made up of ISO orders trading at prices inferior to the NBBO? Are commenters aware of whether a significant portion of ISO orders are excluded from Rule 605 reporting requirements? Do commenters believe that it would be useful for market participants to have access to information about the execution quality of ISO orders submitted with limit prices inferior to the NBBO? Why or why not?

63. Do commenters believe that there are any other market or regulatory changes that have significantly contributed to changes in the extent to which Rule 605 reports contain information about relevant order sizes and order types?

64. Do commenters agree that, by excluding odd-lots, fractional shares, and block orders (*i.e.,* orders that are larger than 10,000 shares), Rule 605 reports are missing information about an important segments of order flow? Why or why not? Do commenters agree that individual investors would benefit from the inclusion of information about odd-lots and fractional share orders? Why or why not? Do commenters agree that the use of block trades has decreased since the initial adoption of Rule 605 but still represents an important segment of order flow in terms of total share volume? Why or why not? Are commenters aware of whether the majority of block orders tend to be not held to the market?

65. Do commenters agree that information about the execution quality of stop orders would be useful for investors? Why or why not? Do commenters agree that market centers and broker-dealers may differ in how they handle stop orders? Why or why not? Do commenters believe that the use of stop orders (*e.g.,* as a percent of total order flow) has increased or decreased in recent years? How might stop orders be different from other types of orders in terms of their execution quality metrics? Do commenters agree that grouping executable stop orders together with other types of NMLOs would skew or add noise to execution quality metrics? Why or why not? Do commenters believe that there could be any negative consequences associated with increasing the transparency of stop-loss order volume, such as the increasing the risk of certain trading strategies, *i.e.,* ''gunning for stops''? Why or why not?

66. Do commenters agree that information about the execution quality of non-exempt short sale orders would be useful for investors? Why or why not? How might non-exempt short sale orders be different from other types of orders in terms of their execution quality metrics? Do commenters believe that grouping non-exempt short sale orders together with other types of orders would skew or add noise to execution quality metrics? Why or why not?

67. Do commenters agree that orders submitted outside of regular market hours represent a small portion of overall order flow, but contain a higher concentration of individual investor orders compared to order flow during regular market hours? Why or why not? Are commenters aware of any other ways in which orders submitted outside of regular market hours differ from other types of orders and, if so, whether these differences would impact execution quality metrics in ways that may skew or add noise to these metrics?

68. Do commenters believe that, following the new definition of ''round lot'' under the MDI Rules, the order size categories currently defined in Rule 605 reports would lead to the exclusion of a relevant portion of order flow? Do commenters find the order size categories currently defined in Rule 605 reports useful? Why or why not?

69. Do commenters believe that the current categorization of NMLOs does not lead to meaningful information about execution quality? Why or why not? Do commenters find these categories useful? If so, why? Do commenters believe that the Commission should use a 10 cent threshold to determine whether a NMLO should be included within the scope of Rule 605?

70. Do commenters believe that information about the execution quality of beyond-the-midpoint limit orders is currently missing from Rule 605 reports and would be useful for investors? Do commenters believe that some market centers, such as wholesalers, may handle beyond-the-midpoint limit orders more like marketable limit orders than NMLOs? Are commenters aware of any other differences in the handling of beyond-the-midpoint limit orders, as compared to other types of NMLOs? If so, do commenters believe that these differences would impact execution quality metrics in ways that may skew or add noise to these metrics?

71. Do commenters believe that the current time-to-execution information required by Rule 605 is inappropriate given the current speed of trading in equity markets? Do commenters believe that the current time-to-execution categories defined in Rule 605 are not granular enough? What do commenters believe would be an appropriate granularity, and does it depend on the type of order (marketable, NMLO, etc.)?

72. Do commenters believe that the current requirements in Rule 605 related to measures of effective, realized and quotes spreads may lead to inaccurate or incomplete information? Do commenters agree that the use of a five-minute time horizon to calculate the realized spread is inappropriate? If so, why? Do commenters believe that the use of a five-minute time horizon leads to biased realized spreads, noisy realized spreads, both, or potentially other issues? Do commenters find effective and realized spreads expressed in dollar terms to be useful? If so, why? Do commenters believe that there are any problems with using effective and realized spreads expressed in dollar terms? If so, what?

73. Do commenters believe that size improvement information is currently missing from Rule 605 reports? If not, what specific information in Rule 605 reports (*e.g.,* effective spreads, price improvement) do commenters make use

of in order to proxy for size improvement?

74. Do commenters believe that information about IOC orders is currently missing from Rule 605 reports and would be useful for investors? Do commenters believe that IOCs likely have different execution quality characteristics than other types of orders? If so, in what ways might these differences impact execution quality metrics? Do commenters believe that these differences would impact execution quality metrics in ways that may skew or add noise to these metrics?

75. Do commenters believe that the reporting of riskless principal transactions as shares executed at the market center is inappropriate? Why or why not? Would commenters find it useful to have access to more information about the extent to which wholesalers internalize orders? If so, in what ways would this information be beneficial?

76. Do commenters believe that the search costs to access, aggregate, and compare execution quality metrics across Rule 605 reporting entities are currently high? Do commenters believe that the search costs are high enough to limit the utility of Rule 605 reports? Are commenters currently able to use Rule 605 reports to compare execution quality measures across market centers? If not, why not? Do commenters believe that the use of third parties to collect Rule 605 data alleviates some of these costs?

77. Do commenters believe the Commission has adequately described the baseline for the market for brokerage services? Are there elements of this market that are relevant to the proposed amendments that are not discussed in the release? If so, please describe.

78. Do commenters believe the Commission has adequately described the baseline for the market for trading services? Are there elements of this market that are relevant to the proposed amendments that are not discussed in the release? If so, please describe.

79. What do commenters believe would be the effect of expanding the scope of Rule 605 reporting entities to include larger broker-dealers on transparency and competition in the market for brokerage services? Do commenters believe that the costs to switching broker dealers are significant? Do commenters believe that there are other significant limits to the effects on competition of expanding the scope of Rule 605 reporting entities and, if so, what are these limits? Do commenters believe that any broker-dealer(s) would need to exit the market as a result of the proposal? If so, what effect if any would this have on competition? What do commenters believe are the effects on competition of limiting the scope of broker-dealers subject to Rule 605 to only include larger broker-dealers?

80. What are commenters' views regarding the effects of the proposal on transparency and competition in the market for trading services? Do commenters believe that there are significant limits to these effects? Do commenters believe that the effects on competition would be different (*e.g.,* stronger or weaker) for competition for individual investor order flow vs. institutional order flow? Do commenters believe that any market center(s) would need to exit the market as a result of the proposal? If so, what effect if any would this have on competition?

81. Do commenters believe that Rule 605 reports as proposed to be amended would contain sufficient information such that the reports could be used to make apples-to-apples comparisons across reporting entities? If not, is there any additional or alternative information that could be required to ensure a more apples-to-apples comparison? Please be specific.

82. Do commenters believe the proposed summary report reflecting aggregated execution quality information would contain sufficient information such that the summary reports could be used to make apples-to-apples comparisons across reporting entities? If not, is there any additional or alternative information that could be required to ensure a more apples-to-apples comparison? Please be specific. Do commenters believe that the availability of Rule 605 summary reports would have an impact on competition between reporting entities? Why or why not? Do commenters believe that the availability of Rule 605 summary reports would increase the likelihood that investors would use execution quality information to compare across reporting entities? Why or why not?

83. Do commenters believe that the availability of alternative sources of execution quality information would limit the effects of the proposal on competition across reporting entities? Do commenters believe that the availability of alternative sources of execution quality information decreases the likelihood that investors would use reports to compare execution quality across reporting entities? If so, which sources?

84. Do commenters agree with the Commission's assessment that the proposal would impact the market for TCA? Why or why not? Are commenters aware of any other market whose competitive structure would be effected by the proposal?

85. What are commenters' views of the benefits of the proposal? Do commenters believe that the proposal would increase transparency regarding the execution quality of reporting entities? Do commenters believe that the proposal would increase competition between reporting entities on the basis of execution quality? Do commenters believe that the proposal would improve execution quality for investors? Would the benefits of the proposal depend on the type of investor (*i.e.,* individual or institutional)? Why or why not? Do commenters believe that there would be any limitations to the benefits and, if so, what? Do commenters believe that the lack of a centralized electronic system for Rule 605 reports represents a limitation to the benefits of the proposed amendments? Why or why not?

86. Do commenters agree that the benefits of the proposed amendments would be limited if investors incur high costs to switch between broker-dealers, and/or if broker-dealers incur costs to switch between market centers in response to information about execution quality? Do commenters believe that these switching costs are currently high? Why or why not?

87. Are commenters aware of circumstances in which customers may not be able to select the broker-dealers of their choice, for example as a result of the customers' order flow characteristics, and whether this has or would have an impact on the switching costs for these customers? Do commenters believe that the proposal, if adopted, would affect such circumstances and, if so, how?

88. What are commenters' views of the costs of the proposal? What do commenters believe would be the main costs of the proposal? What do commenters believe would be the other costs of the proposal, if any? Do commenters believe that costs may vary across reporting entities? If so, which characteristics of the reporting entities would be the main drivers of cost differences between reporting entities? Do commenters believe that the complexity of Rule 605 reports would increase as a result of the proposed amendments and, if so, would this result in additional costs to market participants? Why or why not? Do commenters believe that search costs would increase as a result of the proposed amendments? Why or why not?

89. What are commenters' views regarding the effects the proposed

amendments might have on efficiency and capital formation?

90. Do commenters believe the proposed amendments may have unintended consequences that are not captured by the Commission's assessment of the effects the proposed amendments may have on efficiency, competition and capital formation? Why or why not?

91. Should the Commission adopt an alternative approach to any of the proposed amendments? Why or why not? Which alternatives? What are the benefits and costs of such an approach?

92. Do commenters believe that the Commission should adopt alternatives to the proposal to include only larger broker-dealers with 100,000 or more customer accounts into the scope of Rule 605? Should the Commission adopt alternative thresholds for determining which broker-dealers to include or exclude? What would be the benefits and costs of these alternative thresholds?

93. Do commenters believe that the Commission should adopt alternative amendments to the scope of orders covered by Rule 605? Should the Commission include ISO orders with limit prices inferior to the NBBO into the scope of Rule 605, either as a separate order type category or together with other orders, and what would be the costs and benefits of this approach? Should the Commission exclude orders that are quickly cancelled from Rule 605 reporting requirements? If so, what would be an appropriate threshold cancellation time below which to exclude orders? What would be the costs and benefits of excluding quickly cancelled orders? Should the Commission separate NMLOs submitted outside of regular trading hours as a separate order type category? What would be the costs and benefits of separating NMLOs submitted outside of regular trading hours as a separate order type category?

94. Do commenters believe the Commission should add additional price improvement statistics to Rule 605 reports for segmented orders in qualified auctions measuring price improvement compared to the initial price at which a segmented order was submitted to a qualified auction? If so, what would be the benefits and costs of adding these additional metrics? How would these additional metrics affect competition between qualified auctions at different market centers?

95. Do commenters believe that pipe-delimited ASCII is the best format for Rule 605 reports? Should the Commission instead expand the existing XML Schema that it has created for Rule 606 reports? Should the Commission create a new XML Schema for Rule 605 reports in a manner similar to the XML Schema for Rule 606 reports? Would XML be an improvement over the use of pipe-delimited ASCII and, if so, why? Is there another format—other than pipe-delimited ASCII and XML—that the Commission should require for Rule 605 reports? If so, which format should the Commission use, and why?

96. Should the Commission require that Rule 605 reports be posted in a centralized electronic system? Would a centralized electronic system for Rule 605 reports make it easier for investors, analysts, and others to access and gather information from Rule 605 reports? Would it be beneficial for such a system to include programmatic checks to ensure Rule 605 reports are appropriately standardized, formatted, and complete before acceptance? Do commenters believe there would be any additional benefits from establishing or requiring to be established a centralized electronic system for Rule 605 reports? If so, what? Do commenters have a view on how a centralized electronic system could be implemented? What do commenters estimate would be the costs associated with such a centralized electronic system (including any costs associate with programmatic checks for completeness, consistency, and proper formatting), and who do commenters believe would incur these costs?

97. If the Commission were to adopt a centralized electronic system for Rule 605 reports, do commenters believe EDGAR or a system created and maintained by the NMS Plan is the optimal alternative? Are there other alternatives that the Commission should consider? If so, what would be the costs and benefits associated with posting Rule 605 reports through that system? Should separate centralized electronic systems be established for different categories of reporting entities?

98. Do commenters agree with the Commission's analysis of the accessibility, data quality, costs to build, costs to maintain, reporting costs, and coordination costs associated with using EDGAR or a system created and maintained by the NMS Plan for a centralized electronic system for Rule 605 reports?

99. Are market participants likely to access and download Rule 605 reports from a centralized electronic system, rather than from a reporting entity's website? For which customers will a centralized electronic system be most beneficial, and why? How will these benefits differ if the centralized electronic system uses EDGAR, a system created maintained by the NMS Plan, or any other system proposed by commenters?

VIII. Consideration of Impact on the Economy

For purposes of the Small Business Regulatory Enforcement Fairness Act of 1996, (''SBREFA''),[1066] the Commission requests comment on the potential effect of the proposed amendments to Rule 605 on the United States economy on an annual basis. The Commission also requests comment on any potential increases in costs or prices for consumers or individual industries, and any potential effect on competition, investment, or innovation. Commenters are requested to provide empirical data and other factual support for their views to the extent possible.

IX. Initial Regulatory Flexibility Analysis

The Regulatory Flexibility Act (''RFA'') [1067] requires Federal agencies, in promulgating rules, to consider the impact of those rules on small entities. Section 603(a) [1068] of the Administrative Procedure Act,[1069] as amended by the RFA, generally requires the Commission to undertake a regulatory flexibility analysis of all proposed rules, or proposed rule amendments, to determine the impact of such rulemaking on ''small entities.'' [1070] Section 605(b) of the RFA states that this requirement shall not apply to any proposed rule or proposed rule amendment which, if adopted, would not have a significant economic impact on a substantial number of small entities.[1071]

The proposed rule would apply to market centers—which includes any exchange market maker, OTC market maker, ATS, national securities exchange registered with the Commission under section 6 of the Exchange Act, or national securities association registered with the Commission under section 15A of the Exchange Act—and certain brokers or dealers that are not a market center.[1072]

[1066] Public Law 104–121, Title II, 110 Stat. 857 (1996) (codified in various sections of 5 U.S.C., 15 U.S.C., and as a note to 5 U.S.C. 601).

[1067] 5 U.S.C. 601 *et seq.*

[1068] 5 U.S.C. 603(a).

[1069] 5 U.S.C. 551 *et seq.*

[1070] Although section 601(b) of the RFA defines the term ''small entity,'' the statute permits agencies to formulate their own definitions. The Commission adopted definitions for the term ''small entity'' for purposes of Commission rulemaking in accordance with the RFA. Those definitions, as relevant to this proposed rulemaking, are set forth in 17 CFR 240.0–10.

[1071] *See* 5 U.S.C. 605(b).

[1072] A broker or dealer that is not a market center would not be subject to the requirements unless it reaches or exceeds the customer account threshold.

None of the exchanges registered under section 6 that would be subject to the proposed amendments are ''small entities'' for purposes of the RFA.[1073] There is only one national securities association, and it is not a small entity as defined by 13 CFR 121.201.1220.[1074]

A broker-dealer is considered a small entity for purposes of Regulatory Flexibility Act if: (1) it had total capital of less than $500,000 on the date in the prior fiscal year as of which its audited financial statements were prepared, or, if not required to prepare such statements, it had total capital of less than $500,000 on the last business day of the preceding fiscal year; and (2) it is not affiliated with any person (other than a natural person) that is not a small entity. Applying this standard, the Commission estimates that, of the firms that would be impacted by the Rule, only two exchange market makers, no OTC market makers, and no ATS are small entities.[1075] Because the Commission estimates that not more than two small entities would be required to comply with the proposed rule changes, the Commission certifies that the proposed amendments to Rule 605 would not, if adopted, have a significant economic impact on a substantial number of small entities.

For the above reasons, the Commission certifies that the proposed amendments to Rules 600 and 605, if adopted, would not have a significant economic impact on a substantial number of small entities for purposes of the RFA.

The Commission invites commenters to address whether the proposed rules would have a significant economic impact on a substantial number of small entities, and, if so, what would be the nature of any impact on small entities. The Commission requests that commenters provide empirical data to support the extent of such impact.

Statutory Authority and Text of Proposed Rule

Pursuant to the Exchange Act and particularly sections 3(b), 5, 6, 11A, 15, 17, 19, 23(a), 24, and 36 thereof, 15 U.S.C. 78c, 78e, 78f, 78k–1, 78o, 78q, 78s, 78w(a), 78x, and 78mm, the Commission proposes to amend 17 CFR 242.600 and 17 CFR 242.605 in the manner set forth below.

List of Subjects in 17 CFR Part 242

Brokers, Confidential business information, Fraud, Reporting and recordkeeping requirements, Securities.

For the reasons stated in the preamble, the Commission is proposing to amend title 17, chapter II of the Code of Federal Regulations:

PART 242—REGULATIONS M, SHO, ATS, AC, NMS, AND SBSR AND CUSTOMER MARGIN REQUIREMENTS FOR SECURITY FUTURES

■ 1. The authority for part 242 continues to read as follows:

Authority: 15 U.S.C. 77g, 77q(a), 77s(a), 78b, 78c, 78g(c)(2), 78i(a), 78j, 78k–1(c), 78*l*, 78m, 78n, 78o(b), 78o(c), 78o(g), 78q(a), 78q(b), 78q(h), 78w(a), 78dd–1, 78mm, 80a–23, 80a–29, and 80a–37.

■ 2. Amend § 242.600 by:

■ a. Removing paragraph (b)(40).

■ b. Redesignating paragraphs (b)(9) through (b)(110) as follows:

Old paragraph	New paragraph
(b)(9)	(b)(10)
(b)(10)	(b)(13)
(b)(11)	(b)(15)
(b)(12)	(b)(17)
(b)(13)	(b)(18)
(b)(14)	(b)(19)
(b)(15)	(b)(20)
(b)(16)	(b)(21)
(b)(17)	(b)(22)
(b)(18)	(b)(23)
(b)(19)	(b)(24)
(b)(20)	(b)(25)
(b)(21)	(b)(26)
(b)(22)	(b)(27)
(b)(23)	(b)(28)
(b)(24)	(b)(29)
(b)(25)	(b)(30)
(b)(26)	(b)(31)
(b)(27)	(b)(32)
(b)(28)	(b)(33)
(b)(29)	(b)(34)
(b)(30)	(b)(35)
(b)(31)	(b)(36)
(b)(32)	(b)(37)
(b)(33)	(b)(38)
(b)(34)	(b)(39)
(b)(35)	(b)(40)
(b)(36)	(b)(41)
(b)(37)	(b)(43)
(b)(38)	(b)(45)
(b)(39)	(b)(46)
(b)(40)	deleted
(b)(41)	(b)(48)
(b)(42)	(b)(49)
(b)(43)	(b)(50)
(b)(44)	(b)(51)
(b)(45)	(b)(52)
(b)(46)	(b)(53)
(b)(47)	(b)(54)
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(b)(52)	(b)(59)
(b)(53)	(b)(60)
(b)(54)	(b)(61)
(b)(55)	(b)(62)
(b)(56)	(b)(63)
(b)(57)	(b)(64)
(b)(58)	(b)(65)
(b)(59)	(b)(66)
(b)(60)	(b)(67)
(b)(61)	(b)(68)
(b)(62)	(b)(69)
(b)(63)	(b)(70)
(b)(64)	(b)(71)
(b)(65)	(b)(72)
(b)(66)	(b)(73)
(b)(67)	(b)(74)
(b)(68)	(b)(75)
(b)(69)	(b)(76)
(b)(70)	(b)(77)
(b)(71)	(b)(78)
(b)(72)	(b)(79)
(b)(73)	(b)(80)
(b)(74)	(b)(81)
(b)(75)	(b)(82)
(b)(76)	(b)(83)
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(b)(79)	(b)(86)
(b)(80)	(b)(87)
(b)(81)	(b)(88)
(b)(82)	(b)(89)
(b)(83)	(b)(90)
(b)(84)	(b)(91)
(b)(85)	(b)(92)
(b)(86)	(b)(93)
(b)(87)	(b)(94)
(b)(88)	(b)(95)
(b)(89)	(b)(96)
(b)(90)	(b)(97)
(b)(91)	(b)(98)
(b)(92)	(b)(99)
(b)(93)	(b)(100)
(b)(94)	(b)(101)
(b)(95)	(b)(102)
(b)(96)	(b)(103)
(b)(97)	(b)(104)
(b)(98)	(b)(105)
(b)(99)	(b)(106)
(b)(100)	(b)(107)
(b)(101)	(b)(108)
(b)(102)	(b)(109)
(b)(103)	(b)(110)
(b)(104)	(b)(111)
(b)(105)	(b)(112)
(b)(106)	(b)(113)
(b)(107)	(b)(114)
(b)(108)	(b)(115)
(b)(109)	(b)(116)
(b)(110)	(b)(117)

[1073] *See* 17 CFR 240.0–10(e). 17 CFR 240.0–10(e) states that the term ''small business,'' when referring to an exchange, means any exchange that has been exempted from the reporting requirements of Rule 601 of Regulation NMS, 17 CFR 242.601, and is not affiliated with any person (other than a natural person) that is not a small business or small organization as defined in Rule 0–10. The exchanges subject to this proposed rulemaking do not satisfy this standard. *See also* Securities Exchange Act Release Nos. 82873 (Mar. 14, 2018), 83 FR 13008, 13074 (Mar. 26, 2018) (File No. S7–05–18) (Transaction Fee Pilot for NMS Stocks Proposed Rule); 55341 (May 8, 2001), 72 FR 9412, 9419 (May 16, 2007) (File No. S7–06–07) (Proposed Rule Changes of Self-Regulatory Organizations Proposing Release).

[1074] *See, e.g.,* Securities Exchange Act Release No. 90610 (Dec. 9, 2020), 86 FR 18808 (Apr. 9, 2021), n.2549 and accompanying text.

[1075] These estimates are based on the FYE 2021 FOCUS Reports received by the Commission from exchange market makers, OTC market makers, and ATSs that would be subject to the changes proposed to 17 CFR 242.600 and 17 CFR 242.605.

■ c. Adding new paragraphs (b)(9), (b)(11), (b)(12), (b)(14), (b)(16), (b)(42), (b)(44), and (b)(47).
■ d. Revising newly redesignated paragraphs (b)(10), (b)(13), (b)(19), (b)(20), (b)(30), (b)(57), (b)(108), and (b)(109).

The revisions and additions read as follows:

§ 242.600 NMS security designation and definitions.

* * * * *

(b) * * *

(9) *Average effective over quoted spread* means the share-weighted average for order executions of effective spread divided by the difference between the national best offer and the national best bid at the time of order receipt or, for order executions of non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, the difference between the national best offer and the national best bid at the time such orders first become executable. The effective spread shall be calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at the time of order receipt and, for sell orders, as double the amount of difference between the midpoint of the national best bid and national best offer at the time of order receipt and the execution price. For order executions of non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, average percentage effective spread shall be calculated from the time such orders first become executable rather than the time of order receipt.

(10) *Average effective spread* means the share-weighted average of effective spreads for order executions calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at the time of order receipt and, for sell orders, as double the amount of difference between the midpoint of the national best bid and national best offer at the time of order receipt and the execution price. For order executions of non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, average effective spread shall be calculated from the time such orders first become executable rather than the time of order receipt.

(11) *Average percentage effective spread* means the share-weighted average for order executions of effective spread divided by the midpoint of the national best bid and national best offer at the time of order receipt or, for non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, at the time such orders first become executable. The effective spread shall be calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at the time of order receipt and, for sell orders, as double the amount of difference between the midpoint of the national best bid and national best offer at the time of order receipt and the execution price. For order executions of non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, average percentage effective spread shall be calculated from the time such orders first become executable rather than the time of order receipt.

(12) *Average percentage realized spread* means the share-weighted average for order executions of realized spread divided by the midpoint of the national best bid and national best offer at the time of order receipt or, for non-marketable limit orders, beyond-the-midpoint limit orders, and orders submitted with stop prices, at the time such orders first become executable. The realized spread shall be calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at a specified interval after the time of order execution and, for sell orders, as double the amount of difference between the midpoint and the national best bid and national best offer at a specified interval after the time of order execution and the execution price; provided, however, that the midpoint of the final national best bid and national best offer disseminated for regular trading hours shall be used to calculate a realized spread if it is disseminated less than that specified interval after the time of order execution.

(13) *Average realized spread* means the share-weighted average of realized spreads for order executions calculated, for buy orders, as double the amount of difference between the execution price and the midpoint of the national best bid and national best offer at a specified interval after the time of order execution and, for sell orders, as double the amount of difference between the midpoint and the national best bid and national best offer at a specified interval after the time of order execution and the execution price; provided, however, that the midpoint of the final national best bid and national best offer disseminated for regular trading hours shall be used to calculate a realized spread if it is disseminated less than that specified interval after the time of order execution.

(14) *Best available displayed price* means, with respect to an order to buy, the lower of: the national best offer at the time of order receipt or the price of the best odd-lot order to sell at the time of order receipt as disseminated pursuant to an effective transaction reporting plan or effective national market system plan; and, with respect to an order to sell, the higher of: the national best bid at the time of order receipt or the price of the best odd-lot order to buy at the time of order receipt as disseminated pursuant to an effective transaction reporting plan or effective national market system plan. With respect to a beyond-the-midpoint limit order, the best available displayed price shall be determined at the time such order becomes executable rather than the time of order receipt.

* * * * *

(16) *Beyond-the-midpoint limit order* means, with respect to an order received at a time when a national best bid and national best offer is being disseminated, any non-marketable buy order with a limit price that is higher than the midpoint of the national best bid and national best offer at the time of order receipt and any non-marketable sell order with a limit price that is lower than the midpoint of the national best bid and national best offer at the time of order receipt, and, with respect to an order received at a time when a national best bid and national best offer is not being disseminated, any non-marketable buy order with a limit price that is higher than the midpoint of the national best bid and national best offer at the time that the national best bid and national best offer is first disseminated after the time of order receipt, or any non-marketable sell order with a limit price that is lower than the midpoint of the national best bid and national best offer at the time that the national best bid and national best offer is first disseminated after the time of order receipt.

* * * * *

(19) *Categorized by order size* means dividing orders into separate categories for the following sizes:

(i) Less than a share;

(ii) Odd-lot;

(iii) 1 round lot to less than 5 round lots;

(iv) 5 round lots to less than 20 round lots;

(v) 20 round lots to less than 50 round lots;

(vi) 50 round lots to less than 100 round lots; and

(vii) 100 round lots or greater.

(20) *Categorized by order type* means dividing orders into separate categories for market orders, marketable limit orders (excluding immediate-or-cancel orders), marketable immediate-or-cancel orders, beyond-the-midpoint limit orders, executable non-marketable limit orders (excluding orders submitted with stop prices and beyond-the-midpoint limit orders), and executable orders submitted with stop prices.

* * * * *

(30) *Covered order* means any market order or any limit order (including immediate-or-cancel orders) received by a market center, broker, or dealer during regular trading hours at a time when a national best bid and national best offer is being disseminated and after the primary listing market has disseminated its first firm, uncrossed quotations in the security, and, if executed, is executed during regular trading hours; or any non-marketable limit order (including an order submitted with a stop price) received by a market center, broker, or dealer outside of regular trading hours or at a time when a national best bid and national best offer is not being disseminated and, if executed, is executed during regular trading hours. Covered order shall exclude any order for which the customer requests special handling for execution, including, but not limited to, orders to be executed at a market opening price or a market closing price, orders to be executed only at their full size, orders to be executed on a particular type of tick or bid, orders submitted on a ''not held'' basis, orders for other than regular settlement, and orders to be executed at prices unrelated to the market price of the security at the time of execution.

* * * * *

(42) *Executable* means, for any non-marketable buy order (excluding orders submitted with stop prices), that the limit price is equal to or greater than the national best bid during regular trading hours, and, for any non-marketable sell order (excluding orders submitted with stop prices), that the limit price is equal to or less than the national best offer during regular trading hours. Executable means, for any buy order submitted with a stop price, that the stop price is equal to or greater than the national best bid during regular trading hours, and, for any sell orders submitted with a stop price, that the stop price is equal to or less than the national best offer during regular trading hours. The time an order becomes executable shall be measured in increments of a millisecond or finer.

* * * * *

(44) *Executed outside the best available displayed price* means, for buy orders, execution at a price higher than the best available displayed price; and, for sell orders, execution at a price lower than the best available displayed price.

* * * * *

(47) *Executed with price improvement relative to the best available displayed price* means, for buy orders, execution at a price lower the best available displayed price and, for sell orders, execution at a price higher than the best available displayed price.

* * * * *

(57) *Marketable limit order* means, with respect to an order received at a time when a national best bid and national best offer is being disseminated, any buy order with a limit price equal to or greater than the national best offer at the time of order receipt, or any sell order with a limit price equal to or less than the national best bid at the time of order receipt, and, with respect to an order received at a time when a national best bid and national best offer is not being disseminated, any buy order with a limit price equal to or greater than the national best offer at the time that the national best offer is first disseminated during regular trading hours after the time of order receipt, or any sell order with a limit price equal to or less than the national best bid time at the time that the national best bid is first disseminated during regular trading hours after the time of order receipt.

* * * * *

(108) *Time of order execution* means the time (at a minimum to the millisecond) that an order was executed at any venue.

(109) *Time of order receipt* means the time (at a minimum to the millisecond) that an order was received by a market center for execution, or in the case of a broker or dealer that is not acting as a market center, the time (at a minimum to the millisecond) that an order was received by the broker or dealer for execution.

* * * * *

§ 242.605 [Amended]

■ 2. Amend § 242.605 by revising the introductory text and paragraph (a) to read as follows:

§ 242.605 Disclosure of order execution information.

This section requires market centers, brokers, and dealers to make available standardized, monthly reports of statistical information concerning their order executions. This information is presented in accordance with uniform standards that are based on broad assumptions about order execution and routing practices. The information will provide a starting point to promote visibility and competition on the part of market centers and broker-dealers, particularly on the factors of execution price and speed. The disclosures required by this section do not encompass all of the factors that may be important to investors in evaluating the order routing services of a broker-dealer. In addition, any particular market center, broker, or dealer's statistics will encompass varying types of orders routed by different broker-dealers on behalf of customers with a wide range of objectives. Accordingly, the statistical information required by this section alone does not create a reliable basis to address whether any particular broker-dealer failed to obtain the most favorable terms reasonably available under the circumstances for customer orders.

(a) *Monthly electronic reports by market centers, brokers, and dealers.* (1) Every market center, broker, or dealer shall make available for each calendar month, in accordance with the procedures established pursuant to paragraph (a)(3) of this section, a report on the covered orders in NMS stocks that it received for execution from any person or that it received for execution in a prior calendar month but which remained open. Any market center that operates a qualified auction shall produce a separate report pertaining only to covered orders that the market center receives for execution in a qualified auction. Any market center that provides a separate routing destination that allows persons to enter orders for execution against the bids and offers of a single dealer shall produce a separate report pertaining only to covered orders submitted to such routing destination. Alternative trading systems (as defined in Regulation ATS, § 242.300(a)) shall prepare reports separately from their broker-dealer operators to the extent such entities are required to prepare reports. Each report shall be in electronic form; shall be categorized by security, order type, and order size; and shall include the following columns of information:

(i) For market orders, marketable limit orders, marketable immediate-or-cancel orders, beyond-the-midpoint limit orders, executable non-marketable limit orders, and executable orders with stop prices:

(A) The number of covered orders;

(B) The cumulative number of shares of covered orders;

(C) The cumulative number of shares of covered orders cancelled prior to execution;

(D) The cumulative number of shares of covered orders executed at the receiving market center, broker, or dealer (excluding shares that the market center, broker, or dealer executes on a riskless principal basis);

(E) The cumulative number of shares of covered orders executed at any other venue;

(F) For executions of covered orders, the cumulative number of shares of the full displayed size of the protected bid at the time of execution, in the case of a market or limit order to sell, or the full displayed size of the protected offer at the time of execution, in the case of a market or limit order to buy. For each order, the share count shall be capped at the order size;

(G) For executions of covered orders, the average realized spread as calculated fifteen seconds after the time of execution;

(H) For executions of covered orders, the average percentage realized spread as calculated fifteen seconds after the time of execution;

(I) For executions of covered orders, the average realized spread as calculated one minute after the time of execution;

(J) For executions of covered orders, the average percentage realized spread as calculated one minute after the time of execution;

(K) For executions of covered orders, the average effective spread;

(L) For executions of covered orders, the average percentage effective spread; and

(M) For executions of covered orders, the average effective over quoted spread, expressed as a percentage; and

(ii) For market orders, marketable limit orders, marketable immediate-or-cancel orders, and beyond-the-midpoint limit orders:

(A) The cumulative number of shares of covered orders executed with price improvement;

(B) For shares executed with price improvement, the share-weighted average amount per share that prices were improved;

(C) For shares executed with price improvement, the share-weighted average period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(D) For shares executed with price improvement, the share-weighted median period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(E) For shares executed with price improvement, the share-weighted 99th percentile period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(F) The cumulative number of shares of covered orders executed at the quote;

(G) For shares executed at the quote, the share-weighted average period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(H) For shares executed at the quote, the share-weighted median period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(I) For shares executed at the quote, the share-weighted 99th percentile period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(J) The cumulative number of shares of covered orders executed outside the quote;

(K) For shares executed outside the quote, the share-weighted average amount per share that prices were outside the quote;

(L) For shares executed outside the quote, the share-weighted average period from the time of order receipt, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(M) For shares executed outside the quote, the share-weighted median period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(N) For shares executed outside the quote, the share-weighted 99th percentile period from the time of order receipt to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(O) The cumulative number of shares of covered orders executed with price improvement relative to the best available displayed price;

(P) For shares executed with price improvement relative to the best available displayed price, the share-weighted average amount per share that prices were improved as compared to the best available displayed price;

(Q) The cumulative number of shares of covered orders executed at the best available displayed price;

(R) The cumulative number of shares of covered orders executed outside the best available displayed price;

(S) For shares executed outside the best available displayed price, the share-weighted average amount per share that prices were outside the best available displayed price; and

(iii) For beyond-the-midpoint limit orders, executable non-marketable limit orders, and executable orders with stop prices:

(A) The number of orders that received either a complete or partial fill;

(B) The cumulative number of shares executed regular way at prices that could have filled the order while the order was in force, as reported pursuant to an effective transaction reporting plan or effective national market system plan. For each order, the share count shall be capped at the order size;

(C) For shares executed, the share-weighted average period from the time the order becomes executable to the time of order execution expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer;

(D) For shares executed, the share-weighted median period from the time the order becomes executable to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer; and

(E) For shares executed, the share-weighted 99th percentile period from the time the order becomes executable to the time of order execution, expressed in increments of a millisecond or finer, or, in the case of beyond-the-midpoint limit orders, from the time such orders first become executable to the time of order execution, expressed in increments of a millisecond or finer.

(2) Every market center, broker, or dealer shall make publicly available for each calendar month a report providing summary statistics on all executions of covered orders that are market and marketable limit orders that it received for execution from any person. Such report shall be made available using the most recent version of the XML schema and the associated PDF renderer as published on the Commission's website for all reports required by this paragraph (a)(2). Such report shall include a section for NMS stocks that are included in the S&P 500 Index as of the first day of that month and a section for other NMS stocks. Each section shall include, for market orders and marketable limit orders, the following summary statistics for executed orders, equally weighted by symbol based on share volume:

(i) The average order size;

(ii) The percentage of shares executed at the quote or better;

(iii) The percentage of shares that received price improvement;

(iv) The average percentage price improvement per order;

(v) The average percentage effective spread;

(vi) The average effective over quoted spread, expressed as a percentage; and

(vii) The average execution speed, in milliseconds.

(3) Every national securities exchange on which NMS stocks are traded and each national securities association shall act jointly in establishing procedures for market centers, brokers, and dealers to follow in making available to the public the reports required by this section in a uniform, readily accessible, and usable electronic form.

(4) In the event there is no effective national market system plan establishing such procedures, market centers, brokers, and dealers shall prepare their reports in a consistent, usable, and machine-readable electronic format, in accordance with the requirements in paragraph (a)(1) of this section, and make such reports available for downloading from an internet website that is free and readily accessible to the public.

(5) Every market center, broker, or dealer shall keep the reports required by paragraphs (a)(1) and (a)(2) of this section posted on an internet website that is free and readily accessible to the public for a period of three years from the initial date of posting on the internet website.

(6) A market center, broker, or dealer shall make available the reports required by paragraphs (a)(1) and (a)(2) of this section within one month after the end of the month addressed in the reports.

(7) A broker or dealer that is not a market center shall not be subject to the requirements of this section unless that broker or dealer introduces or carries 100,000 or more customer accounts through which transactions are effected for the purchase or sale of NMS stocks (the ''customer account threshold'' for purposes of this paragraph). For purposes of this section, a broker or dealer that utilizes an omnibus clearing arrangement with respect to any of its underlying customer accounts shall be considered to carry such underlying customer accounts when calculating the number of customer accounts that it introduces or carries. Any broker or dealer that meets or exceeds this customer account threshold and is also a market center shall produce separate reports pertaining to each function. A broker or dealer that meets or exceeds the customer account threshold shall be required to produce reports pursuant to this section for at least three calendar months (''Reporting Period''). The Reporting Period shall begin the first calendar day of the next calendar month after the broker or dealer met or exceeded the customer account threshold, unless it is the first time the broker or dealer has met or exceeded the customer account threshold, in which case the Reporting Period shall begin the first calendar day four calendar months later. If, at any time after a broker or dealer has been required to produce reports pursuant to this section for at least a Reporting Period, a broker or dealer falls below the customer account threshold, the broker or dealer shall not be required to produce a report pursuant to this paragraph for the next calendar month.

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By the Commission.

Dated: December 14, 2022.

J. Matthew DeLesDernier,

Deputy Secretary.

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