SECURITIES AND EXCHANGE COMMISSION

17 CFR Parts 200 and 242

[Release No. 34-82873; File No. S7-05-18]

RIN 3235-AM04

Transaction Fee Pilot for NMS Stocks

AGENCY: Securities and Exchange Commission.

ACTION: Proposed rule.

SUMMARY: The Securities and Exchange Commission ("Commission" or "SEC") is proposing to conduct a Transaction Fee Pilot for National Market System ("NMS") stocks to study the effects that transaction-based fees and rebates may have on, and the effects that changes to those fees and rebates may have on, order routing behavior, execution quality, and market quality more generally. The data generated by the proposed pilot should help inform the Commission, as well as market participants and the public, about any such effects and thereby facilitate a data-driven evaluation of the need for regulatory action in this area.

DATES: Comments should be received on or before **[**insert date 60 days after publication in the Federal Register**]**.

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/proposed.shtml); or
- Send an email to rule-comments@sec.gov. Please include File Number S7-05-18 on the subject line.

Paper comments:

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

All submissions should refer to File Number S7-05-18. 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. 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 20549-1090 on official business days between the hours of 10:00 a.m. and 3:00 p.m. 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: Richard Holley III, Assistant Director; Johnna Dumler, Special Counsel; Erika Berg, Special Counsel; or Benjamin Bernstein, Attorney-Advisor, each with the Division of Trading and Markets, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549, or at (202) 551-5777.

SUPPLEMENTARY INFORMATION: The Commission is proposing to adopt Rule 610T to establish a Transaction Fee Pilot.

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I. Overview

As an integral part of its oversight of the U.S. equities markets, where liquidity is dispersed across a large number of trading centers that are linked through technology and regulation into a national market system, the Commission assesses market developments, including changes in technology and business practices, as it seeks to ensure that the current regulatory framework continues to effectively and efficiently promote fair and orderly markets, investor protection, and capital formation. From a regulatory perspective, today's equity market structure has been shaped by, among other things, Regulation NMS, adopted in 2005, which established the regulatory framework within which the markets transitioned from a primarily manual to a primarily automated trading environment.[1] Among other things, Regulation NMS put in place order protection requirements to govern intermarket trading in an electronically linked world of dispersed markets, and supplemented those requirements with rules addressing fair and efficient access to quotations and limits on fees charged to access newly protected quotations.[2] Subsequent to the adoption of Regulation NMS, market practices, aided by technological innovation, including advancements in data management and analysis, and competition, have continued to evolve.

Since the adoption of Regulation NMS, the Commission and its staff have undertaken a number of reviews of market structure and market events.[3] In addition, the Commission has

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1 See Securities Exchange Act Release No. 51808 (June 9, 2005), 70 FR 37496, 37543-46 (June 29, 2005) ("NMS Adopting Release").

2 See id.

3 See, e.g., Securities Exchange Act Release No. 61358 (January 14, 2010), 75 FR 3594, 3600 and 3603 (January 21, 2010) ("Concept Release") (evaluating broadly the performance of market structure since Regulation NMS, particularly for long-term investors and for businesses seeking to raise capital, and soliciting comment on whether regulatory initiatives to improve market structure are needed). See also Findings Regarding the Market Events of May 6, 2010 (September 30, 2012), available at https://www.sec.gov/news/studies/2010/marketevents-report.pdf (a report of the staffs of the Commission and the Commodity Futures Trading Commission to the Joint Advisory Committee on Emerging Regulatory Issues on the events of May 6, 2010 (the "Flash Crash"), which analyzed the extraordinary volatility experienced on that day and market participant behavior in response thereto). In response to lessons learned during the Flash Crash, the Commission and the self-regulatory organizations ("SROs") focused on a number of critical market structure initiatives, including single stock circuit breakers for select NMS stocks and the Limit Up-Limit Down Plan successor thereto, which now serves as the primary volatility moderator in the U.S. equity markets. See, e.g., Securities Exchange Act Release Nos. 62252 (June 10, 2010), 75 FR 34186 (June 16, 2010) (File Nos. SR-BATS-2010-014; SR-EDGA-2010-01; SR-EDGX-2010-01; SR-BX-2010-037; SR-ISE-2010-48; SR-NYSE-2010-39; SR-NYSEAmex-2010-46; SR-NYSEArca-2010-41; SR-NASDAQ-2010-061; SR-CHX-2010-10; SR-NSX-2010-05; SR-CBOE-2010-047) (order approving rule changes to provide for trading pauses in individual stocks when the price moves ten percent or more in the preceding five minute period); 62251 (June 10, 2010), 75 FR 34183 (June 16, 2010) (File No. SR-FINRA-2010-025) (order approving a rule to permit a halt trading otherwise than on an exchange where a primary

focused on initiatives to preserve the operational integrity of markets and market participants[4] and pursued a number of initiatives to enhance regulatory oversight of the markets, improve the information available to market participants about execution activity and the operation of Alternative Trading Systems ("ATSs"), and explored options to improve how equity market structure works for small companies.[5]

In addition, the Equity Market Structure Advisory Committee ("EMSAC") provided the Commission with diverse perspectives on the structure and operations of the U.S. equities markets, as well as advice and recommendations on matters related to equity market structure.[6]

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listing market has issued a trading pause due to extraordinary market conditions); and 67091 (May 31, 2012), 77 FR 33498 (June 6, 2012) (File No. 4-631) (order approving, on a pilot basis, the national market system plan to address extraordinary market volatility).

4 See Securities Exchange Act Release Nos. 63241 (November 3, 2010), 75 FR 69792 (November 15, 2010) (File No. S7-03-10) (Market Access Rule) and 73639 (November 19, 2014), 79 FR 72252 (December 5, 2014) (File No. S7-01-13) (Regulation Systems Compliance and Integrity).

5 See Securities Exchange Act Release Nos. 79318 (November 15, 2016), 81 FR 84696 (November 23, 2016) (File No. 4-698) (order approving the National Market System Plan Governing the Consolidated Audit Trail); 78309 (July 13, 2016), 81 FR 49431 (July 27, 2016) (File No. S7-14-16) (proposed amendments to Rule 606 of Regulation NMS that would require broker-dealers to disclose additional data to their customers on their routing and execution of institutional orders); 76474 (November 18, 2015), 80 FR 80997 (December 28, 2015) (File No. S7-23-15) (proposed rule concerning operational transparency and regulatory oversight of ATSs); and 74892 (May 6, 2015), 80 FR 27514, 27517-18 (May 13, 2015) (File No. 4-657) (order approving the NMS Plan to Implement a Tick Size Pilot Program) ("Tick Size Pilot Approval Order").

6 The EMSAC was a Federal Advisory Committee established as a broad-based group of experts charged with providing the Commission recommendations on a range of complex market structure issues. See Securities Exchange Act Release No. 74092 (January 20, 2015), 80 FR 3673 (January 23, 2015) (File No. 265-29). See also Equity Market Structure Advisory Committee – Subcommittees, available at https://www.sec.gov/spotlight/equity-market-structure/equity-market-structure-advisory-committee-subcommittees.htm. The EMSAC and its four subcommittees discussed a variety of equity market structure issues, including Regulation NMS, trading venue regulation, market quality, and customer issues. One of the EMSAC's subcommittees

In particular, the EMSAC's recommendations helped to shape the proposal contained herein – namely, a pilot program to produce data on the effect of equity exchange transaction fees and rebates, and changes to those fees and rebates, on order routing behavior, execution quality, and market quality. Informed by EMSAC's recommendation, the Commission believes that an appropriately constructed pilot should provide a valuable source of data to facilitate an informed data-driven discussion about potential alternative approaches to prevailing fee structures.

The discussion below references various types of "trading centers," which is a collective term that refers broadly to the venues that trade NMS stocks.[7] For purposes of this release, the term "trading center" includes national securities exchanges that are registered with the Commission and that trade NMS stocks (referred to herein as "equities exchanges" or "exchanges"), as well as other types of "non-exchange venues" that trade NMS stocks, including ATSs and broker-dealers that internalize orders by matching them off-exchange with reference to the national best bid and offer.[8] As discussed below, the proposed Pilot would apply only to equities exchanges.

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focused exclusively on Regulation NMS, especially Rule 610(c) (access fees) and Rule 611 (order protection), and considered whether parts of Regulation NMS should be updated in light of the evolution of technology, markets, and market participants. As part of its ongoing review of market structure, the Commission is considering the EMSAC's recommendations as it assesses potential changes to Regulation NMS.

7 See 17 CFR 242.600(b)(78) (defining "trading center" as "a national securities exchange or national securities association that operates an SRO trading facility, an alternative trading system, an exchange market maker, an OTC market maker, or any other broker or dealer that executes orders internally by trading as principal or crossing orders as agent.").

8 See 17 CFR 242.600(b)(42) (defining "national best bid and national best offer").

II. Transaction Fees

A. Background

Exchanges and other trading centers aggregate orders to buy and sell securities from market participants and have historically charged their members and users fees when they match an order to buy against an order to sell, at which point an execution occurs. As competition among trading centers intensified in the late 1990s, ATSs, and then exchanges, began to offer rebates to attract order flow.[9] The predominant model that has emerged in the U.S. equities markets is the "maker-taker" fee model, in which, on the one hand, a trading center pays its broker-dealer participants a per share rebate to provide (i.e., "make") liquidity in securities and, on the other hand, the trading center assesses them a fee to remove (i.e., "take") liquidity.[10] The trading center earns as revenue the difference between the fee paid by the "taker" of liquidity and the rebate paid to the provider or "maker" of liquidity. In a variation on this theme, some other

[9] See, e.g., Memorandum on Maker-Taker Fees on Equities Exchanges from the Commission's Division of Trading and Markets to the Market Structure Advisory Committee (October 20, 2015), available at https://www.sec.gov/spotlight/emsac/memo-maker-taker-fees-on-equities-exchanges.pdf (outlining the development of the maker-taker fee model in the U.S. and summarizing the current public debate about its impact on equity market structure) ("Staff Maker-Taker Memo"). The memo traces the development of transaction fees and summarizes the potential benefits and limitations of maker-taker pricing by presenting market participants' divergent views.

[10] See id. New fees that an exchange seeks to impose on its members or persons using its facilities are effective on the day that the exchange files them with the Commission, and neither advance notice nor Commission action is required before an exchange may implement a fee change. See 15 U.S.C. 78s(b)(3)(A)(ii). Though Form 19b-4 fee filings are not subject to Commission approval, the Commission may, within 60 days after an exchange filed its fee change with the Commission, summarily suspend the new fee and institute proceedings to determine whether to disapprove it. See 15 U.S.C. 78s(b)(3)(C). Exchange fees are subject to the statutory standards set forth in Section 6 of the Securities Exchange Act of 1934 ("Exchange Act"), which require, among other things, that an exchange's fees be an "equitable allocation" of "reasonable" fees and that they not be "designed to permit unfair discrimination." See 15 U.S.C. 78f(b)(4)-(5).

trading centers have adopted a "taker-maker" pricing model (also called an inverted model), in which they charge the provider of liquidity and pay a rebate to the taker of liquidity.[11]

The Commission periodically has addressed the "access fees" charged by trading centers to access their quotes.[12] In 2005, the Commission again spoke to this issue by adopting Rule 610(c) under Regulation NMS, which prohibits trading centers from imposing, or permitting to be imposed, any fees for the execution of an order against a "protected quotation"[13] that exceed or accumulate to more than $0.0030 per share.[14] The $0.0030 per share cap largely codified the

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11 See, e.g., Cboe BYX U.S. Equities Exchange Fee Schedule (as of March 2018), available at https://markets.cboe.com/us/equities/membership/fee_schedule/byx/.

12 For example, in the mid-1990s, the Commission allowed an electronic communication network ("ECN") to facilitate specialist and market maker quotation obligations by communicating to the public quotation system the best price and size of orders entered into the ECN by specialists or market makers as long as the ECN met certain conditions and noted that ECNs may impose fees for access to its system that are "similar to the communications and systems charges imposed by various markets, if not structured to discourage access by non-subscriber broker-dealers." Securities Exchange Act Release No. 37619A (September 6, 1996), 61 FR 48290, 48314 n.272 (September 12, 1996) (File No. S7-30-95). See also Securities Exchange Act Release No. 40760 (December 8, 1998), 63 FR 70844, 70871 (December 22, 1998) (File No. S7-12-98). Commission staff subsequently issued a series of no-action letters with respect to access fees charged by ECNs to non-subscribers. These letters permitted fees in amounts equal to those that they charge a "substantial proportion" of their active broker-dealer subscribers, but no more than $0.009 per share. See Securities Exchange Act Release No. 49325 (February 26, 2004), 69 FR 11126, 11156 (March 9, 2004) (File No. S7-10-04) ("NMS Proposing Release") (discussing the no-action relief and the inability of ECNs to charge fees that have the effect of creating barriers to access for non-subscribers).

13 Rule 600(b)(58) of Regulation NMS defines a "protected quotation" as a "protected bid or a protected offer." 17 CFR 242.600(b)(58). Rule 600(b)(57) of Regulation NMS, in turn, defines a "protected bid or protected offer" as a quotation in an NMS stock that is: (i) displayed by an "automated trading center," (ii) disseminated pursuant to an effective national market system plan, and (iii) an "automated quotation" that is the best bid or best offer of a national securities exchange or national securities association. 17 CFR 242.600(b)(57). See also 17 CFR 242.600(b)(3) (defining "automated quotation").

14 See 17 CFR 242.610(c). See also NMS Adopting Release, supra note 1, at 37543-46. In the Regulation NMS Proposing Release, the Commission initially proposed to cap the access fees that any individual market participant could charge for equities at $0.0010 per

prevailing fee level set through competition among the various trading centers.[15] The cap on access fees established by Rule 610(c) sought in part to prevent high access fees in excess of the cap from undermining Regulation NMS's price protection and linkage requirements, while preserving the business model used by trading centers dependent upon revenue from fees.[16]

For maker-taker exchanges, the amount of the taker fee is bounded by the cap imposed by Rule 610(c) on the fees the exchange can charge to access its best bid/offer for NMS stocks.[17] This cap applies to the fees assessed on an incoming order that executes against a resting order or quote, but does not directly limit rebates paid. The Rule 610(c) cap on fees also typically indirectly limits the amount of the rebates that an exchange offers to less than $0.0030 per share

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share, with a total accumulated access fee limit of $0.0020 per share in any transaction. See NMS Proposing Release, supra note 12, at 11157-59. In its proposal, the Commission expressed concern that access fees added significant non-transparent costs to transactions, potentially encouraged locked markets, and created an unequal playing field as non-ECN broker-dealers were not permitted to charge access fees in addition to their posted quotations. See id. However, the Commission ultimately adopted an access fee cap of $0.0030, in order to simplify the initial proposal (see NMS Adopting Release, supra note 1, at 37502) and for the reasons outlined infra at notes 15-16 and accompanying text. See 17 CFR 242.610(c). See also NMS Adopting Release, supra note 1, at 37545.

15 See NMS Adopting Release, supra note 1, at 37545 (stating that "the $0.003 fee limitation is consistent with current business practices, as very few trading centers currently charge fees that exceed this amount").

16 See id. at 37596 ("In the absence of a fee limitation, the adoption of the Order Protection Rule and private linkages could significantly boost the viability of the outlier business model. Outlier markets might well try to take advantage of intermarket price protection by acting essentially as a toll booth between price levels. The high fee market likely will be the last market to which orders would be routed, but prices could not move to the next level until someone routed an order to take out the displayed price at the outlier market. Therefore, the outlier market might see little downside to charging exceptionally high fees, such as $0.009, even if it is last in priority."). See also 17 CFR 242.610(c). Maker-taker fees also are subject to the proposed rule change process for fees under the Exchange Act. See 15 U.S.C. 78s(b)(3)(A) and 17 CFR 240.19b-4(f)(2).

17 See 17 CFR 242.610(c).

in order to maintain net positive transaction revenues.[18] For taker-maker exchanges, the amount of the maker fee charged to the provider of liquidity is not bounded by the Rule 610(c) cap, but such fees typically are no more than $0.0030, and the taker of liquidity earns a rebate.[19]

As discussed below, the maker-taker and taker-maker fee models adopted by exchanges have attracted considerable attention.[20] In recent years, a variety of concerns have been expressed about the maker-taker fee model, in particular the rebates they pay to attract orders. For example, some have questioned whether the prevailing fee structure has created a conflict of interest for broker-dealers, who must pursue the best execution of their customers' orders while facing potentially conflicting economic incentives to avoid fees or earn rebates—both of which typically are not passed through the broker-dealer to its customers—from the trading centers to which they direct those orders for execution.[21] One academic study of selected market data suggested that some broker-dealers route non-marketable orders to the trading center offering the

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18 See, e.g., Staff Maker-Taker Memo, supra note 9, at 3. For example, a maker-taker equities exchange may charge a member $0.0030 to remove liquidity and pay a rebate of $0.0025 to the member that adds liquidity. See, e.g., Cboe BZX U.S. Equities Exchange Fee Schedule (as of March 2018), available at https://markets.cboe.com/us/equities/membership/fee_schedule/bzx/. The revenue earned by a maker-taker exchange on transactions equals the difference between the fee charged and the rebate paid.

19 See, e.g., Cboe BYX U.S. Equities Exchange Fee Schedule (as of March 2018), available at https://markets.cboe.com/us/equities/membership/fee_schedule/byx/ (where, for securities above $1.00, the fee for adding liquidity is $0.0019 and the rebate for removing liquidity is $0.0005). The make fee on a taker-maker exchange is not bounded by Rule 610(c) because such fee is not a charge to access the market's best bid/offer for NMS stocks.

20 See infra notes 21-28 and accompanying text. See also U.S. DEP'T OF THE TREASURY, A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITY: CAPITAL MARKETS 62-63 (2017).

21 See, e.g., Stanislav Dolgopolov, "The Maker-Taker Pricing Model and its Impact on the Securities Market Structure: A Can of Worms for Securities Fraud?," 8 VA. L. & BUS. REV. 231, 270 (2014), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2399821.

highest rebate, and do so in a manner that the authors contended might not be consistent with the broker-dealers' duty of best execution.[22] Others have expressed concern that maker-taker access fees may (a) undermine market transparency since displayed prices do not account for exchange transaction fees or rebates and therefore do not reflect the net economic costs of a trade; (b) serve as a way to effectively quote in sub-penny increments on a net basis when the effect of a maker-taker exchange's sub-penny rebate is taken into account even though the minimum quoting increment is expressed in full pennies; (c) introduce unnecessary market complexity through the proliferation of new exchange order types (and new exchanges) designed solely to take advantage of pricing models; and (d) drive orders to non-exchange trading centers as market participants seek to avoid the higher fees that exchanges charge to subsidize the rebates they offer.[23]

By contrast, others have indicated that the maker-taker model may have positive effects by enabling exchanges to compete with non-exchange trading centers and narrowing quoted

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22 Robert H. Battalio, Shane A. Corwin, and Robert H. Jennings, "Can Brokers Have It All? On the Relation Between Make-Take Fees and Limit Order Execution Quality," Journal of Finance 71, 2193-2237 (2016), available at http://onlinelibrary.wiley.com/doi/10.1111/jofi.12422/full ("Battalio Equity Market Study"). A non-marketable order is an order with a limit price that prevents its immediate execution at current market prices. See also infra note 229 (discussing non-marketable orders).

23 See, e.g., Curt Bradbury, Market Structure Task Force Chair, Board of Directors, SIFMA, and Kenneth E. Bentsen Jr., President and Chief Executive Officer, SIFMA, Opinion, "How to Improve Market Structure," N.Y. TIMES (July 14, 2014), available at http://dealbook.nytimes.com/2014/07/14/how-to-improve-market-structure/?_r=0; Larry Harris, "Maker-Taker Pricing Effects on Market Quotations," at 24-25 (November 14, 2013), available at http://bschool.huji.ac.il/.upload/hujibusiness/Maker-taker.pdf ("Harris"); Dolgopolov, supra note 21; Letter from Richard Steiner, Global Equities Liaison to Regulatory & Government Affairs, RBC Capital Markets, to Elizabeth Murphy, Secretary, Commission, at 4 (November 22, 2013) ("RBC Capital Markets Letter I"), available at https://www.sec.gov/comments/s7-02-10/s70210-411.pdf.

spreads by subsidizing posted prices.[24] In particular, maker-taker fees may narrow displayed spreads in some securities insofar as the liquidity rebate effectively subsidizes the prices of displayed liquidity.[25] In turn, that displayed liquidity may establish the national best bid and offer, which is often used as the benchmark for marketable order flow, including retail order flow, that is executed off-exchange by either matching or improving upon those prices.[26] Accordingly, retail orders may benefit indirectly from the subsidy provided by maker-taker exchanges.

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24 See, e.g., Michael Brolley & Katya Malinova, "Informed Trading and Maker-Taker Fees in a Low Latency Limit Order Market," at 2 (October 24, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178102 ("If a maker rebate is introduced in competitive markets, the bid-ask spread will decline by (twice) the maker rebate.") ("Brolley and Malinova"); Shawn O'Donoghue, "The Effect of Maker-Taker Fees on Investor Order Choice and Execution Quality in U.S. Stock Markets" (January 23, 2015), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2607302 ("O'Donoghue"); and Jean-Edouard Colliard & Thierry Foucault, "Trading Fees and Efficiency in Limit Order Markets," Oxford University Press, at n.13 (September 1, 2012), available at http://thierryfoucault.com/publications/research-papers/ (arguing that maker-taker rebates may help equities exchanges compete with off-exchange payment for order flow arrangements, in which wholesale broker-dealers purchase retail order flow for trading off-exchange).

25 See, e.g., Letter from Richie Prager, Managing Director, Head of Trading and Liquidity Strategies, BlackRock, Inc., to Mary Jo White, Chair, SEC, at 2 (September 12, 2014), available at: http://www.sec.gov/comments/s7-02-10/s70210-419.pdf ("Some participants have called for elimination of rebates and maker-taker pricing in its entirety in conjunction with access fees, but BlackRock believes that incentives for providing liquidity positively impact market structure. Incentives promote price discovery in public markets, increase available liquidity and tighten spreads. Rebates compensate liquidity providers for exposing orders to adverse selection and information leakage."). See also Harris, supra note 23, at 1-2 (noting that while economic theory suggests that maker-taker pricing should have narrowed average bid-ask spreads, intervening factors, such as the growth in electronic trading, make it difficult to "entirely attribute[]" the observed reduction in bid-ask spreads to maker-taker pricing; in addition, spreads cannot decrease for stocks that already trade at penny-wide spreads).

26 See Concept Release, supra note 3, at 3600.

Some have urged the Commission to gather data to assess the potential impact of transaction fees and rebates in the U.S. markets.[27] Most recently, as discussed below, the EMSAC recommended that the Commission conduct a pilot to study the impact of transaction fees on market quality and order routing behavior.[28] Informed by that recommendation, the views of those submitting comment letters on the EMSAC's proposal, and the information and research described herein, the Commission is proposing that a pilot program be conducted that would produce data on the effects of equity exchange transaction fees and rebates, and possible effects of changes in those fees and rebates, on order routing behavior, execution quality, and market quality.

B. Calls for a Pilot

The concept of a pilot program to gather data to study the effects of the maker-taker model on market quality and order routing behavior has attracted increasing attention in recent years.[29] Nasdaq experimented with changes to its transaction fees when it lowered access fees and rebates in 14 stocks over a four-month period in 2015.[30] Through its experiment, Nasdaq

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27 See infra note 29 and accompanying text. Limited experiments on a single market with a limited subset of securities, like the test performed by The Nasdaq Stock Market LLC ("Nasdaq") discussed below, where order flow can quickly move to other exchanges that are not taking part in the experiment, do not offer the same insights as a comprehensive market-wide study on transaction fees. See infra notes 30-34 and accompanying text.

28 See Recommendation for an Access Fee Pilot (July 8, 2016), available at https://www.sec.gov/spotlight/emsac/recommendation-access-fee-pilot.pdf ("EMSAC Pilot Recommendation"); see also supra note 38 and accompanying text.

29 See, e.g., Letter from Micah Hauptman, Financial Services Counsel, Consumer Federation of America, to Brent J. Fields, Secretary, Commission, at 2 (December 22, 2014), available at https://www.sec.gov/comments/4-657/4657-64.pdf (recommending an access fee pilot as an alternative to a tick size pilot); and RBC Capital Markets Letter I, supra note 23, at 3.

30 See Securities Exchange Act Release No. 73967 (December 30, 2014), 80 FR 594 (January 6, 2015) (SR-NASDAQ-2014-128) ("Nasdaq Pilot") (lowering the access fee to

observed that "[l]iquidity providers [were] the primary responders to the fee changes during the experiment," whereas there were "no significant changes in the nature of liquidity taking during the pilot."[31] While liquidity providers could readily route orders to other trading centers offering higher maker rebates, Nasdaq offered a number of possible explanations for why liquidity takers did not appear to respond to its experiment, including the fact that order routing decisions were primarily driven by best execution parameters not by exchange fees.[32] For these reasons, Nasdaq itself observed that "the results for Nasdaq would not necessarily be duplicated industry-wide if

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remove liquidity from $0.0030 to $0.0005 and reducing the credit paid to display liquidity to $0.0004 (such credits otherwise ranged from $0.0015 to $0.00305)).

31 See Nasdaq Access Fee Experiment May 2015 Report, at 1, available at http://www.nasdaqomx.com/digitalAssets/98/98718_accessfeereporttwo.pdf ("Nasdaq May Report"). Nasdaq noted that one of the aims of its experiment was to "examine the importance of liquidity provider rebates to participant firms' posting behavior on Nasdaq." Id. Nasdaq's experiment showed what it characterized as statistically significant effects on the Nasdaq Stock Market. For example, Nasdaq observed the following initial impact on its market share: "In aggregate, Nasdaq's equally-weighted market share in the experiment stocks declined by 2.9 percentage points from January to February. This compares to a decline of 0.9 percentage points in Nasdaq market share in the control stocks. The change observed in the experiment stocks is statistically significant using the diff-in-diff measure." See Nasdaq Access Fee Experiment March 2015 Report, at 1, available at http://images.qnasdaqomx.com/Web/NASDAQOMX/%7Be737af7a-07e8-4119-859c-096b306fc6f2%7D_Fee_Cap_Report_3-6-15v3.pdf ("Nasdaq March Report"). It also observed the following impact on its displayed liquidity: "Nasdaq's time at the NBBO in the experiment stocks declined 4.9 percentage points from 93.0% in January to 88.1% February (Figure 2). This compares to a decline of 0.3 percentage points in the control stocks. The difference between the experiment and control stocks is statistically significant." See id. at 2.

32 See, e.g., Nasdaq May Report, supra note 31, at 3. Other possible explanations offered by Nasdaq include, for example, the fact that the number of stocks in its experiment was too low to justify broker-dealers recoding their liquidity taking algorithms in response to the experiment, the possibility that liquidity taking activity for some firms may not consider access fees, or that some liquidity taking algorithms may be based on displayed size. See id. ("…a fifth conjecture is that the economic incentives for taking liquidity from sources other than Nasdaq are not materially affected by the reduction in Nasdaq's access fees").

access fees and rebates were reduced across the board."[33] In other words, Nasdaq's experiment involved a small sample of stocks on a single market for a short duration, all of which make it difficult to draw inferences about what would happen if all exchanges participated in the same experiment simultaneously. The Commission preliminarily believes, therefore, that a pilot is necessary to gather data to facilitate analysis of the impact of fees and rebates on the equities exchanges broadly.[34]

More recently, the EMSAC's Regulation NMS Subcommittee ("Subcommittee")[35] prepared an outline for a potential access fee pilot, and the EMSAC discussed that outline, and

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33 Nasdaq May Report, supra note 31, at 1. See also EMSAC Pilot Recommendation, supra note 28, at 3 ("Limited experiments, such as the recent Nasdaq pilot, have shown that individual market experiments do not yield conclusive results about the potential impact of market-wide policy reform on access fees.").

34 See, e.g., Nasdaq May Report, supra note 31, at 1 (noting that "…the results for Nasdaq would not necessarily be duplicated industry-wide if access fees and rebates were reduced across the board."). See also EMSAC Pilot Recommendation, supra note 28, at 3 ("Limited experiments, such as the recent Nasdaq pilot, have shown that individual market experiments do not yield conclusive results about the potential impact of market-wide policy reform on access fees."); Nasdaq March Report, supra note 31, at 3 ("Some commentators on the access fee experiment have indicated that a voluntary change in the access fee by one exchange in fourteen stocks does not tell you what would happen if there were a mandatory change in the regulatory maximum access fee across all exchanges in a considerable number of stocks of NMS stocks. We do not disagree with that point. Nasdaq believed in launching the experiment that fourteen stocks were enough to induce behavioral changes with statistically and economically measurable changes. The results from February have proven that belief was correct."); and Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, SIFMA, to Brent J. Fields, Secretary, Commission (January 30, 2015), at 2, available at http://www.sec.gov/comments/sr-nasdaq-2014-128/nasdaq2014128-1.pdf ("In particular, the proposal's limited scope and application cannot act as a substitute for a market-wide access fee reduction that would change the dynamics of access fees and rebates across the entire market. For the proposal to accurately measure the structural impact of reduced access fees, the proposal should be carried out across all exchanges and with a larger sampling of symbols."). See also Section V.B.1.b.i infra for additional discussion of the Nasdaq study.

35 The Subcommittee first convened in November 2015, and began by focusing on maker-taker access fees. In a series of meetings over the following months, the Subcommittee

the topic of access fees in general, at its April 2016 meeting.[36] Following that meeting, the Subcommittee revised its recommendation and prepared a formal recommendation for consideration by the EMSAC.[37] The EMSAC considered that revised proposal and recommended that the Commission pursue an access fee pilot.[38] The EMSAC's recommendation stated:

> The intent of the proposed pilot is to better understand, within the context of our current market structure, the effect of access fees on liquidity provision, liquidity taking and order routing with the ultimate goal of improving market quality. The Committee does not believe that there are any certain or predetermined outcomes from the pilot, and the net effect of many counterbalancing factors are not believed to be significantly beneficial or detrimental to any single group. Ultimately, the findings from the pilot are purely

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assembled an outline of proposed terms for an access fee pilot. It identified general goals and prepared a recommendation for the consideration of the full EMSAC for the scope of a potential pilot, including stock selection, pricing buckets, and duration, and it also considered the potential inclusion of non-exchange markets, taker-maker exchanges, and a trade-at component. Minutes of those meetings and other information are available at https://www.sec.gov/spotlight/equity-market-structure/equity-market-structure-advisory-committee-subcommittees.htm.

36 See Framework for a Potential Access Fee Pilot (April 19, 2016), available at https://www.sec.gov/spotlight/emsac/emsac-regulation-nms-subcommittee-recommendation-041916.pdf. At its April 2016 meeting, EMSAC discussed the topic of maker-taker fees and heard from a number of outside experts. See EMSAC Transcript, April 26, 2016, available at https://www.sec.gov/spotlight/emsac/emsac-042616-transcript.txt.

37 See Regulation NMS Subcommittee Recommendation for an Access Fee Pilot (June 10, 2016), available at https://www.sec.gov/spotlight/emsac/emsac-regulation-nms-recommendation-61016.pdf ("June Recommendation").

38 The EMSAC considered the Subcommittee's June Recommendation and adopted it, by a vote of 15-1, with slight modifications that preserved the basic structure of the June Recommendation but incorporated additional detail, for example, settling on a two-year term and recommending 100 securities in each test bucket. See EMSAC Pilot Recommendation, supra note 28. See also EMSAC Transcript, July 8, 2016, available at https://www.sec.gov/spotlight/emsac/emsac-070816-transcript.txt. The EMSAC member who voted against the EMSAC Pilot Recommendation noted his concern that "capping access fees is going to discourage liquidity provision and increase spreads" before voting against the EMSAC Pilot Recommendation. See id. at 22:24-23:6.

intended to inform the broader debate on how to improve market quality for issuers, investors and market participants.[39]

The EMSAC's pilot recommendation featured four buckets of common stocks and Exchange-Traded Funds ("ETFs")[40] with a market capitalization of at least $3 billion: a control bucket and three test buckets with successively lower access fee caps of $0.0020, $0.0010, and $0.0002.[41] Consistent with the scope of Rule 610(c) of Regulation NMS, the EMSAC recommendation did not include an outright prohibition on rebates or include taker-maker exchanges in the pilot.[42] The EMSAC recommended a two-year term for a pilot and outlined a number of metrics that could be assessed in connection with the pilot.[43]

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39 EMSAC Pilot Recommendation, supra note 28, at 1.

40 See infra note 96 (discussing ETFs).

41 See EMSAC Pilot Recommendation, supra note 28, at 2. The EMSAC noted that it "intentionally selected $.0002 as the rate in Bucket 4 in order to create a bucket where any rebate should result in a de minimis economic incentive." Id. at 4.

42 In addition, consistent with the framework of Rule 610(c), the EMSAC's proposed fee caps would apply to protected quotations and not depth of book quotations, and would have no direct application to ATSs. See id. at 2.

43 See id. at 2. The recommendation did not include a "trade-at" provision that would restrict price matching of protected quotations, but mentioned an option to include ATSs in the pilot. See id. at 5 (noting that if trade-at were included, "the likely shift of flows as a result of trade-at would both make the pilot more complex and impact the effective measurement of the access fee change"). The EMSAC also noted that "[t]he tick pilot will yield some trade-at results that can be further studied; thus duplication is not warranted." See id. See also Tick Size Pilot Approval Order, supra note 5, at 27517-18 (discussing a trade-at prohibition that, subject to certain exceptions, prevents a trading center that was not quoting from price matching protected quotations and permits a trading center that was quoting at a protected quotation to execute orders at that level, but only up to the amount of its displayed size).

C. Comments on the EMSAC Recommendation

Following the establishment of the EMSAC, the Commission received a number of comment letters regarding the impact of access fees and rebates in the equities markets.[44]

[44] Letter from Haim Bodek, Managing Principal, and Stanislav Dolgopolov, Regulatory Consultant, Decimus Capital Markets, LLC, to Brent J. Fields, Secretary, Commission (April 25, 2016), available at https://www.sec.gov/comments/265-29/26529-63.pdf ("Decimus Capital Markets Letter"); Letter from Elizabeth King, NYSE, to Brent J. Fields, Secretary, Commission (May 13, 2016), available at https://www.sec.gov/comments/265-29/26529-66.pdf ("NYSE Letter"); Letter from Joan C. Conley, Senior Vice President and Corporate Secretary, Nasdaq, to Brent J. Fields, Secretary, Commission (May 24, 2016), available at https://www.sec.gov/comments/265-29/26529-71.pdf ("Nasdaq Letter"); Letter from Richard Steiner, RBC Capital Markets, to The Honorable Mary Jo White, Chair, Commission (May 24, 2016), available at https://www.sec.gov/comments/265-29/26529-70.pdf ("RBC Capital Markets Letter II"); Letter from Security Traders Association to SEC EMSAC (June 15, 2016), available at https://www.sec.gov/comments/265-29/26529-74.pdf ("Security Traders Association Letter"); Letter from Kermit Kubitz to SEC EMSAC (July 5, 2016), available at https://www.sec.gov/comments/265-29/26529-73.htm ("Kubitz Letter"); Letters from J A to Chair White, Commissioners, and SEC EMSAC (May 23, 2016, & September 13, 2016), available at https://www.sec.gov/comments/265-29/26529-68.htm & https://www.sec.gov/comments/265-29/26529-85.htm ("J A Letters"); Letter from Richard Steiner, Electronic Trading Strategist, RBC Capital Markets, to Mary Jo White, Chair, Commission (September 23, 2016), available at https://www.sec.gov/comments/265-29/26529-86.pdf ("RBC Capital Markets Letter III"); Letter from Tyler Gellasch, Executive Director, Healthy Markets Association, to Brent J. Fields, Secretary, Commission (December 23, 2016), available at https://www.sec.gov/comments/265-29/26529-1441899-130023.pdf ("Healthy Markets Letter I"); Letter from Theodore R. Lazo, Managing Director & Associate General Counsel, SIFMA, to Brent J. Fields, Secretary, Commission (March 29, 2017), available at https://www.sec.gov/comments/265-29/26529-1674696-149276.pdf ("SIFMA Letter"); Letter from Tyler Gellasch, Executive Director, Healthy Markets Association, to Brent J. Fields, Secretary, Commission (April 3, 2017), available at https://www.sec.gov/comments/265-29/26529-1681516-149500.pdf ("Healthy Markets Letter II"); Letter from Tyler Gellasch, Executive Director, Healthy Markets Association, to Hon. W. Jay Clayton, Chairman, Commission (June 13, 2017), available at https://www.sec.gov/comments/265-29/26529-1801830-153704.pdf ("Healthy Markets Letter III"); Letter from Chris Concannon, President and Chief Operating Officer, Cboe, Thomas Wittman, CEO, The Nasdaq Stock Market LLC, and Thomas W. Farley, President, NYSE, to Hon. Jay Clayton, Chairman, Commission (October 13, 2017), available at https://www.sec.gov/comments/265-29/26529-2641078-161300.pdf ("Joint Exchange Letter"); Letter from Brad Katsuyama, Chief Executive Officer, and John

Several commenters voiced support for a pilot in general or for the various proposals considered by the Subcommittee and the EMSAC that culminated in the EMSAC Pilot Recommendation. One commenter, for example, expressed support for an access fee pilot and characterized the Subcommittee's recommendation as "an excellent roadmap" for such a pilot.[45] Other commenters that support an access fee pilot remarked that the maker-taker pricing model contributes to opaque, non-transparent markets, increases market complexity and fragmentation, and generates conflicts of interest that may impede best execution of orders, and they urged the Commission to act promptly on a pilot that could produce useful data on these issues.[46]

Ramsay, Chief Market Policy Officer, Investors Exchange LLC, to Hon. Jay Clayton, Chairman, Commission (November 15, 2017), available at https://www.sec.gov/comments/265-29/26529-2691444-161491.pdf ("IEX Letter"); Email from Tim Quast, President, ModernNetworks IR LLC, to Hon. Jay Clayton, Chairman, Commission (December 5, 2017), available at https://www.sec.gov/comments/265-29/26529-2777697-161622.pdf.

45 See Decimus Capital Markets Letter, supra note 44, at 2.

46 See, e.g., Letter from Ari Burstein, Associate General Counsel, Investment Company Institute, to Brent Fields, Secretary, Commission (May 11, 2015), available at https://www.sec.gov/comments/265-29/26529-10.pdf (recommending that the Commission establish a pilot program that would prohibit rebates and reduce access fees) ("Investment Company Institute Letter I"); Letter from Managed Funds Association to SEC EMSAC (September 29, 2015), available at https://www.sec.gov/comments/265-29/26529-28.pdf (urging "a disciplined, data-driven study" and calling for analysis of access fees' effects on market liquidity, order routing, execution transparency, transaction costs, and competition); Letter from David W. Blass, General Counsel, Investment Company Institute, to SEC EMSAC (January 20, 2016), available at https://www.sec.gov/comments/265-29/26529-48.pdf (urging the Commission to establish a phased pilot program for highly liquid stocks that would reduce access fees and prohibit rebates) ("Investment Company Letter II"); Letter from the Trading Issues Committee, Canadian Security Traders Association, Inc., to Brent Fields, Secretary, Commission (April 6, 2016), available at https://www.sec.gov/comments/265-29/26529-61.pdf (proposing a cross-border study on the effect of rebates on market quality in conjunction with the Canadian Securities Administrators); J A Letters, supra note 44 (retail investor supporting proposed pilot but suggesting test of payment for order flow and inclusion of "trade-at" provision); Security Traders Association Letter, supra note 44 (supporting a pilot of limited number of securities with varying access fee caps and "no

Some of these same commenters suggested modifications to the ideas ultimately embodied in the EMSAC Pilot Recommendation. For example, one commenter suggested including a wider range of securities with lower market capitalizations, instead of focusing only on the highly liquid securities proposed by the EMSAC.[47] Several other commenters argued that any pilot should either ban rebates altogether or include a "no-rebate" test bucket—an approach that the EMSAC considered, but did not ultimately recommend.[48] Finally, a number of

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other variables"); RBC Capital Markets Letter III, supra note 44 (concluding that an access fee pilot based on the EMSAC recommendation would be "a positive step" and further suggesting a no-rebate bucket and the inclusion of taker-maker exchanges and ATSs); Healthy Markets Letter I, supra note 44 (applauding many aspects of the EMSAC recommendation, but suggesting that it include all trading venues and a "trade-at" provision); SIFMA Letter, supra note 44 (proposing, as one alternative, that the Commission adopt the EMSAC recommendation); IEX Letter, supra note 44 (supporting the concept of a fee pilot conducted by the SEC, but recommending that the pilot include a no-rebate bucket and apply to inverted exchanges).

47 See Decimus Capital Markets Letter, supra note 44, at 11. But cf. Investment Company Institute Letter II, supra note 46, at 6-7 (asserting that pilot securities should be highly liquid stocks, as measured by average daily trading volume); Joint Exchange Letter, supra note 44, at 5 (expressing concern that liquidity in less active stocks could be negatively impacted by a pilot, but acknowledging that, "if less active stocks are omitted, it is difficult to envision the securities that should be selected . . ."). See also infra Section III.B (discussing the securities to be included in the proposed pilot, which incorporates a broader range of securities than the EMSAC recommendation, including NMS stocks with market capitalizations below $3 billion).

48 See Investment Company Institute Letter II, supra note 46, at 7 (recommending that the Commission establish a phased pilot program for highly liquid stocks that would reduce access fees and prohibit rebates); RBC Capital Markets Letter III, supra note 44, at 3 (advocating for the inclusion of a "no-rebate" bucket in the pilot); Healthy Markets Letter II, supra note 44, at 6 n.15 (suggesting that the Commission establish a pilot that eliminates rebates); SIFMA Letter, supra note 44, at 9-10 (suggesting, as an alternative to an access fee pilot, that the Commission eliminate rebates); IEX Letter, supra note 44, at 3-4 (stating that restrictions on access fees may not help the Commission to evaluate alternatives to the current exchange pricing system, which is driven primarily by rebates, and advocating for the inclusion of a "no-rebate" bucket in the pilot). See also Nasdaq Letter, supra note 44, at 3 (asserting that any pilot should apply to both fees and rebates). But cf. NYSE Letter, supra note 44, at 3-4 (arguing that elimination of rebates, without any other offsetting incentives, may reduce market-maker incentives to provide liquidity).

commenters advocated for applying a pilot to taker-maker exchanges as well as ATSs.[49]

In a joint letter, three exchanges recommended several other changes[50] if the Commission proceeds with a pilot based on the EMSAC's recommendation.[51] These commenters suggested that such a pilot should, among other things: (1) study "all forms of remuneration," in part by adding measures specifically to study ATS and broker-dealer remuneration and to show how the savings realized by broker-dealers from lowered exchange transaction fees are "returned to customers," [52] (2) measure costs to issuers and shareholders and allow issuers to have a voice in whether they are included in a pilot,[53] (3) pre-announce the measures for benchmarking and

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See also infra Section III.C (discussing the design of the proposed pilot, which includes a "no-rebate" bucket).

49 See RBC Capital Markets Letter III, supra note 44, at 4 (suggesting that the pilot should be applied to taker-maker exchanges and ATSs); Healthy Markets Letter I, supra note 44, at 3-4 (taking the view that "all relevant exchanges" and ATSs should be included in the pilot). See also Nasdaq Letter, supra note 44, at 3 (recommending that the Commission establish a pilot that applies to all trading centers, including ATSs); Joint Exchange Letter, supra note 44, at 5 (recommending that the pilot apply to trading in all off-exchange venues); IEX Letter, supra note 44, at 4 (suggesting that the access fee pilot should include taker-maker exchanges). See also infra Section III.A (discussing the Commission's decision to include taker-maker exchanges, but not ATSs, in the proposed pilot).

50 See notes 47 and 49 supra, and note 62 infra, for a discussion of other changes recommended by these three exchanges.

51 See Joint Exchange Letter, supra note 44, at 4-5.

52 But cf. IEX Letter, supra note 44, at 2 ("The idea that a substantial conflict of interest cannot be addressed unless all other conflicts are addressed simultaneously is not viable.").

53 See Section III.B infra (discussing the Commission's decision to include a broader range of securities than the EMSAC recommendation, including NMS stocks with market capitalizations below $3 billion). See also Sections V.C.2.b and V.D.3 infra (discussing the potential costs to small and mid-capitalization issuers).

tracking the impact of a pilot,[54] and (4) "measure gross shifts in trading from exchange to off-exchange venues and among off-exchange venues."[55]

Other commenters expressed concern regarding the impact of a pilot.[56] For example, the New York Stock Exchange LLC ("NYSE") believed that, while the pilot's lowered fee caps in the three test groups would reduce the direct costs paid by broker-dealers to access displayed exchange quotations, it also would effectively limit the rebates paid by exchanges to attract liquidity, which could "reduce the competitiveness of exchanges relative to dark pools…."[57] NYSE further argued that the Subcommittee's concept for a pilot was "designed to test investors' and listed companies' tolerance for worsening market quality" since market making and market

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54 See Section III.E infra (discussing the measures that the Commission intends to use to benchmark and track the impact of the proposed Pilot).

55 See Joint Exchange Letter, supra note 44, at 4-5. See also Section III.E.3 infra (discussing the order routing data that the Commission intends to use to measure shifts in trading); Section V.E.1 infra (noting that the Commission can use existing data sources to track shifts in trading between equities exchanges and ATSs).

56 See, e.g., Letter from David M. Weisberger, Managing Director and Global Head, RegOne Solutions, a Markit company, to Brent Fields, Secretary, Commission (October 9, 2015), available at https://www.sec.gov/comments/265-29/26529-30.pdf (raising various questions about proposals to modify access fees, including risks that such proposals could hurt retail investors and lower available liquidity); Letter from John I. Sanders & Benjamin Leighton, Wake Forest School of Law Community Law and Business Clinic (October 20, 2015), at 6-7, available at https://www.sec.gov/comments/265-29/26529-33.pdf (opining that a shift away from maker-taker pricing could affect liquidity and suggesting that the Commission instead focus on utilizing market manipulation rules, limiting order types, and regulating colocation).

57 NYSE Letter, supra note 44, at 3. NYSE was critical of the potential application of access fee caps to non-displayed liquidity, an idea considered but not recommended by the EMSAC, because it believed that such caps on exchanges would advantage ATSs. Id. at 5-6.; but cf. RBC Capital Markets Letter III, supra note 44, at 4 (asserting that the pilot program should cover non-displayed orders on exchanges to ensure complete and accurate data). See also infra Section III.C (discussing the design of the proposed pilot).

quality "are largely driven by incentives and corresponding obligations."[58] NYSE recommended an alternative initiative that would lower access fee caps, prohibit maker-taker pricing models, and institute a "trade-at" rule.[59]

Nasdaq suggested the Commission pursue an alternative pilot that caps both fees and rebates, as it believed that more meaningful data would result by removing price from market participants' routing decisions.[60] Nasdaq also argued that the pilot should apply to all trading centers.[61] Finally, Nasdaq thought that a two-year term for a pilot would be too long, observing that its own transaction fee experiment suggested that the impact on liquidity provision was evident quickly.[62]

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58 See NYSE Letter, supra note 44, at 3.

59 See id. at 6. Some commenters seemed to agree with NYSE that a "trade-at" rule should be included in the pilot. See Nasdaq Letter, supra note 44, at 2. Others opposed inclusion of a "trade-at" rule. See RBC Capital Markets Letter III, supra note 44 (stating that a "trade-at" rule would be duplicative, given the inclusion of such a component in the Tick Size Pilot, and opining that a "trade-at" rule could obscure data showing the impact of pricing); Healthy Markets Letter I, supra note 44, at 4 (noting that inclusion of a "trade-at" rule would increase the pilot's complexity and decrease its utility, but opining that all trading venues should be included in the pilot if a "trade-at" rule is excluded). See also infra Section III.C (discussing the design of the proposed pilot).

60 See Nasdaq Letter, supra note 44, at 3. See also infra Section III.C.3 (discussing the Pilot's inclusion of a "no-rebate" bucket).

61 See Nasdaq Letter, supra note 44, at 3. See also infra Section III.A (discussing the Commission's decision to expand on the EMSAC Pilot Recommendation to apply the Pilot to all equities exchanges, but not to ATSs).

62 See Nasdaq Letter, supra note 44, at 3; Joint Exchange Letter, supra note 44, at 5 (recommending that the proposed pilot last no more than one year and that the Commission develop criteria for evaluating the possibility of the pilot's early termination). See also, e.g., Nasdaq May Report, supra note 31, at 1 (summarizing some of Nasdaq's explanations regarding the results of its transaction fee experiment); and infra Section III.D (discussing the Commission's decision to limit the two-year term recommended by EMSAC with an automatic sunset at the end of the first year).

One commenter, the Chicago Board Options Exchange, Incorporated, now known as Cboe Exchange, Inc. ("Cboe"), recommended against doing a pilot, and instead suggested abolishing the equity fee cap and requiring ATSs to file fee changes with the Commission.[63] Similarly, Nasdaq, NYSE, and Cboe jointly suggested that the Commission should forgo conducting a pilot that only touches on one aspect of Regulation NMS and instead recommended a broader review of the impact of remuneration on routing and trading.[64] Alternatively, Nasdaq, NYSE, and Cboe recommended that, if the Commission seeks to conduct an access fee pilot, it should first (1) articulate a strong and clear duty of best execution to ameliorate the conflict of interest between a broker and its customer, (2) require improved disclosures regarding execution quality and routing practices to deter potential conflicts, and (3) adopt its proposed amendments to Regulation ATS[65] to enhance the operational transparency of ATSs.[66]

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63 See Letter from Edward T. Tilly, CEO, Cboe, to SEC EMSAC (January 28, 2016), available at https://www.sec.gov/comments/265-29/26529-51.pdf. Cboe opined that "broad and arbitrary price controls" are a "drastic measure" that conflicts with "the very concept of a market-based system." Id. at 9-10. As another alternative, one commenter proposed that the Commission require venues to include "all-in" costs in their visible quotes. See Letter from Michael J. Friedman, General Counsel, Trillium, to Brent J. Fields, Secretary, Commission (May 14, 2015), available at https://www.sec.gov/comments/265-29/26529-18.pdf.

64 See Joint Exchange Letter, supra note 44, at 2 and 6. Investors Exchange LLC ("IEX"), disagreed with this suggestion and pointed out that the Commission "has been engaged in a holistic review of market structure at least since the issuance of its Equity Market Structure Concept Release in 2010," which "has led to consideration of the Fee Pilot." See IEX Letter, supra note 44, at 3. IEX further opined that maker-taker pricing need not be addressed simultaneously with all other market structure issues, given "the amount of fees and rebates involved (over $2.5 billion in 2016), the inefficiencies that result from hundreds of pricing tiers, and the proven negative consequences to investors that result from routing orders to high rebate exchanges." Id. at 2-3.

65 Securities Exchange Act Release No. 40760 (December 8, 1998), 63 FR 70844 (December 22, 1998).

Investors' Exchange LLC ("IEX") responded to the comments jointly submitted by Nasdaq, NYSE, and Cboe by characterizing those exchanges' arguments as "part of a familiar playbook to stave off market reform."[67] While IEX agreed that Nasdaq, NYSE, and Cboe had identified important areas for consideration, IEX did not support delaying action on a transaction fee pilot[68] and disputed whether the broad review suggested by Nasdaq, NYSE, and Cboe was necessary.[69] Rather, IEX strongly supported the idea of a transaction fee pilot, but recommended that any such pilot include a "no-rebate" bucket and apply to inverted exchanges.[70]

III. Discussion of the Proposed Pilot

The Commission is proposing to conduct a Transaction Fee Pilot (the "Pilot" or "Transaction Fee Pilot") for NMS stocks, as described below. In formulating this proposal, the Commission has taken into consideration the recommendation of the EMSAC for an access fee pilot, the views of those submitting comment letters on the EMSAC's proposal, and the information and research described throughout this release. The Commission's proposal, in an effort to more broadly test the impact of transaction fees and rebates, differs from the EMSAC's recommendation in several respects, as discussed further below.[71] The Commission notes that

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66 See Joint Exchange Letter, supra note 44, at 2-4. But cf. IEX Letter, supra note 44, at 3 (characterizing this recommendation as one with "no logic other than commercial protectionism in delaying action on fees and rebates").

67 See IEX Letter, supra note 44, at 2.

68 See id. at 3.

69 See id. at 2-3; see also notes 52 and 64 supra.

70 See id. at 1-4; see also notes 48-49 supra.

71 Because the proposed Pilot would apply more broadly to more types of transaction fees beyond only fees to access a protected quotation, the Commission therefore is not characterizing the proposal as an "Access Fee Pilot."

the proposed Pilot is not designed to test the impact of transaction fees and rebates on all aspects of equities market structure, including market fragmentation and the proliferation of complex order types, but rather focuses on order routing behavior, execution quality, and market quality.

The following chart summarizes the proposed terms of the Pilot, which are discussed in more detail below:

<table>
<tr><th colspan="3">Outline of the Proposed
Transaction Fee Pilot for NMS Stocks</th></tr>
<tr><td>Duration</td><td colspan="2">2 years with an automatic sunset at 1 year unless, no later than thirty days prior to that time, the Commission publishes a notice that the pilot shall continue for up to another year;
plus a six-month pre-Pilot Period and six-month post-Pilot Period</td></tr>
<tr><td>Applicable Trading Centers</td><td colspan="2">Equities exchanges (including maker-taker & taker-maker)
but not ATSs or other non-exchange trading centers</td></tr>
<tr><td>Pilot Securities</td><td colspan="2">NMS stocks with a share price ≥ $2 per share that do not close below $1 per share during the proposed Pilot and that have an unlimited duration or a duration beyond the end of the post-Pilot Period</td></tr>
<tr><td rowspan="4">Pilot Design</td><td>Test Group 1</td><td><u>$0.0015 fee cap</u>
for removing & providing displayed liquidity
(no cap on rebates)</td></tr>
<tr><td>Test Group 2</td><td><u>$0.0005 fee cap</u>
for removing & providing displayed liquidity
(no cap on rebates)</td></tr>
<tr><td>Test Group 3</td><td><u>Rebates and Linked Pricing Prohibited</u>
for removing & providing displayed & undisplayed liquidity
(Rule 610(c)’s $0.0030 cap continues to apply to fees for removing displayed liquidity)</td></tr>
<tr><td>Control Group (Remaining Pilot Securities)</td><td>Rule 610(c)’s cap continues to apply to fees for removing displayed liquidity (no cap on rebates)</td></tr>
</table>

A. <u>Applicable Trading Centers</u>

The proposed Pilot, consistent with the EMSAC’s recommendation, would apply solely to the equities exchanges. The fee cap under Rule 610(c), on which the proposed Pilot is largely based, does not apply to options exchanges.[72] Specifically, the fee cap under Rule 610(c) applies to NMS stocks on a per share basis whereas options contracts are derivatives that represent a number of shares, typically 100 shares of stock per options contract for a single-stock option, and the current fee cap under Rule 610(c) is not calibrated to account for that difference.[73] Because options and equities are materially different types of securities, the current fee cap applicable to equities exchanges does not apply, and cannot readily be applied, to options exchanges. If options exchanges were to be included in a pilot, the Commission would first need to create a new type of fee cap to apply to options exchanges and then consider how that cap would impact current options exchange fee models, which would introduce considerable additional complexity.[74] For these reasons, the Commission is not proposing to include options exchanges in the proposed Pilot.

However, the scope of the proposed Pilot would be broader than both the EMSAC's recommendation and Rule 610(c), in that it would include all equities exchanges—including taker-maker exchanges. For example, the proposed Pilot's fee cap in Test Groups 1 and 2 (detailed below) would apply the cap to the take fee on a maker-taker exchange and also would

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72 See 17 CFR 242.610(c) (addressing "fees for the execution of an order . . . in an NMS stock," where "NMS stock" is defined as "any NMS security other than an option" under 17 CFR 242.600(b)(47)).

73 As a result, options exchange fees for the execution of one options contract typically far exceed the Rule 610(c) cap of $0.0030. See, e.g., NYSE Arca Options Fee Schedule, available at https://www.nyse.com/publicdocs/nyse/markets/arca-options/NYSE_Arca_Options_Fee_Schedule.pdf (including fees, as of September 2017, of $0.50 for electronic executions that take liquidity in Penny Pilot Issues for Broker-Dealer orders).

74 See also EMSAC Pilot Recommendation, supra note 28, at 5. None of the comment letters submitted to the EMSAC advocated for including options exchanges in an access fee pilot.

apply the cap to the maker fee on a taker-maker exchange.[75] The EMSAC did not recommend including taker-maker exchanges or ATSs in an access fee pilot because it endeavored to remain consistent with the current market structure, including the Rule 610(c) access fee cap, which only caps fees for removing a protected quotation and does not apply to ATSs.[76] A number of commenters disagreed with the approach recommended by the EMSAC.[77] These commenters asserted that a pilot would provide more meaningful data if applied more broadly;[78] one commenter explained that a broader approach would reduce the possibility of "gaming," as well as provide more accurate testing of order flows.[79] Another commenter believed that liquidity and market quality on traditional, maker-taker exchanges would suffer unless taker-maker exchanges and ATSs were included in the proposed Pilot.[80] Another commenter believed that a pilot should include all equities exchanges and ATSs, but acknowledged that a pilot based on the

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75 See supra note 19 (discussing Rule 610(c) and the taker-maker model). The proposed fee caps in Test Groups 1 and 2 (detailed below) would not apply to rebates. For example, the proposed Pilot's fee cap in Test Group 2 would not apply the cap to the maker rebate on a maker-taker exchange, nor would it apply the cap to the taker rebate on a taker-maker exchange.

76 See EMSAC Pilot Recommendation, supra note 28, at 5.

77 See supra note 49.

78 See, e.g., Nasdaq Letter, supra note 44, at 3; IEX Letter, supra note 44, at 4 (arguing that inverted exchanges should be included in a pilot because the pilot otherwise would test "only how much distortive pricing can be transferred to these venues").

79 See RBC Capital Markets Letter III, supra note 44, at 4. But cf. infra notes 86-93 and accompanying text (acknowledging the potential for "gaming," but discussing the Commission's decision to exclude ATSs from the Pilot).

80 See Nasdaq Letter, supra note 44, at 2. But cf. infra notes 89-93 and accompanying text (noting that Nasdaq's fee experiment results would not necessarily be duplicated in an industry-wide pilot and explaining that the Pilot could potentially improve the competitive position of exchanges vis-à-vis ATSs).

current parameters of Rule 610(c) would be difficult to apply to taker-maker exchanges and ATSs.[81]

The Commission believes that the proposed Pilot should be designed to broadly study the impact of transaction fees and rebates on order routing behavior, execution quality, and market quality. To achieve a broader study, the Commission preliminarily believes that including all equities exchanges, including taker-maker exchanges, in the proposed Pilot is appropriate. Including all equities exchanges in the proposed Pilot will ensure that the Pilot will collect data on all equities markets that are registered national securities exchanges, whose fees are all subject to the requirements of the Exchange Act and the rule filing requirements thereunder, thus treating equally all similarly situated entities.

However, expanding the proposed Pilot to non-exchange trading centers, such as ATSs, whose fees currently are not subject to Rule 610(c) would have the effect of imposing, in the terms of a pilot, an entirely new regulatory regime on entities whose fees are not currently subject to the substantive and process requirements applicable to exchanges, and that are currently not subject to access fee caps in any respect. The Commission, therefore, believes that doing so would introduce a number of complexities that it preliminarily does not believe are warranted for purposes of this proposed Pilot. In particular, while equities exchanges charge transaction-based fees, ATSs, especially "dark pool" ATSs that are part of a large broker-dealer order handling business, may not charge separate transaction-based fees for executions in their ATSs, and instead might use bundled pricing that does not associate particular orders with

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81 See Healthy Markets Letter I, supra note 44, at 4; see also Section III.A infra (discussing the difficulties of applying the Pilot to ATSs).

particular fees.[82] Consequently, incorporating ATSs into the proposed Pilot would be substantially more complex if the proposed Pilot required ATSs to radically change their fee models and renegotiate their pricing arrangements with their customers in order to assess fees differently than they do today solely to accommodate the proposed Pilot.[83]

Because the proposed Pilot is designed to study, among other things, the potential conflicts of interest faced by broker-dealers when routing orders as a result of transaction fees and rebates, it is necessary to be able to directly observe the effects of changes in transaction fees and rebates on their trading. As discussed above, some have questioned whether a broker-dealer's economic incentive to avoid transaction-based fees and earn transaction-based rebates impacts its order routing decisions in a manner that creates a misalignment between the broker-dealer's economic interests and its obligation to seek the best execution for its customer's order.[84] To the extent ATSs do not charge transaction-based fees, it is not practicable to include them in a pilot that is structured to test the impact of changes in transaction fees. Accordingly, the Commission preliminarily believes that excluding ATSs from the proposed Pilot is appropriate, and that broadly applying the Pilot to all equities exchanges, regardless of their pricing model, will allow the proposed Pilot to collect data on the effects of changes in

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82 See, e.g., Letter from William P. Neuberger and Andrew F. Silverman, Managing Directors and Global Co-Heads of Morgan Stanley Electronic Trading, to Brent J. Fields, Secretary, Commission (May 19, 2016), available at https://www.sec.gov/comments/s7-23-15/s72315-37.pdf (commenting on File No. S7-23-15 concerning regulation of NMS Stock Alternative Trading Systems and noting that ATS fees may be bundled with brokerage services).

83 See infra Section V.E.1. (noting that the inclusion of ATSs in the proposed Pilot may not be practical and is likely to substantially increase the costs of the proposed Pilot).

84 See supra notes 21-22 and accompanying text.

transaction fees and rebates, which will permit the study of, among other things, potential conflicts of interest faced by broker-dealers when routing orders.[85]

The Commission acknowledges the concerns raised by Nasdaq about excluding ATSs from the proposed Pilot.[86] Specifically, Nasdaq noted that during its fee experiment, when Nasdaq lowered its rebates, liquidity providers "immediately moved their quotes to other exchanges."[87] As a result, Nasdaq stated that unless ATSs are included in the pilot "we are likely to find that liquidity and market quality on exchanges will be fundamentally harmed, ultimately to the detriment of public investors" and "[i]ssuers included in the pilot would see a diminishment of transparent quotes, widening of quoted spreads, and an inferior overall trading experience."[88] However, as discussed above, unlike for liquidity adding orders, Nasdaq found "no significant changes in the nature of liquidity taking" during its fee experiment.[89] The Commission believes, as discussed above and as Nasdaq itself observes, that "the results for Nasdaq would not necessarily be duplicated industry-wide if access fees and rebates were reduced across the board."[90] For example, the fact that some market participants "immediately moved their quotes to other exchanges" may be because other equities exchanges did not

85 While ATSs would not be subject to the proposed Pilot, data on ATS market share are available from FINRA, available at https://otctransparency.finra.org, which could provide an indication of whether routing to ATSs increase or decrease during the proposed Pilot. See infra Section V.C.1.b. (discussing possible changes in routing to ATSs during the proposed Pilot).

86 See Nasdaq Letter, supra note 44, at 2.

87 Id.

88 Id.

89 See Nasdaq May Report, supra note 31, at 1.

90 Nasdaq May Report, supra note 31, at 1. See also EMSAC Pilot Recommendation, supra note 28, at 3 ("Limited experiments, such as the recent Nasdaq pilot, have shown that individual market experiments do not yield conclusive results about the potential impact of market-wide policy reform on access fees.").

participate in Nasdaq's fee experiment and those market participants who specifically sought to quote on an equities exchange, and not an ATS, responded accordingly by moving some of their activity to equities exchanges that continued to offer rebates. The Commission notes that the proposed Pilot would not impact the ability of an equities exchange to maintain a "protected quote," an advantage that an ATS does not enjoy, and to the extent that the demand associated with liquidity taking on exchanges remains stable, it could continue to attract liquidity providers desiring that protection despite changes to rebates. Further, the Commission notes that some have argued that high equities exchange maker rebates necessitate high offsetting taker fees, which may cause some liquidity taking order flow to migrate to non-exchange trading centers in search of lower transaction costs.[91] The proposed Pilot's lower fee caps in Test Groups 1 and 2, discussed below, could possibly improve the competitive position of exchanges vis-à-vis ATSs.[92]

Accordingly, the Commission preliminarily believes that it is appropriate to exclude ATSs from the proposed Pilot, which also is consistent with the EMSAC's recommendation.[93] The Commission further notes that the inclusion of ATSs is discussed as an alternative in the economic analysis below.

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91 See, e.g., BlackRock Inc. Viewpoint, U.S. Equity Market Structure: An Investor Perspective, at 7 (April 2014), available at https://www.blackrock.com/corporate/en-us/literature/whitepaper/viewpoint-us-equity-market-structure-april-2014.pdf ("Reducing the access fee caps is one solution that would narrow the price disparity and lessen the impact of cost in routing decisions. This may also curb the usage of off-exchange venues, such as dark pools and internalizers, as a major benefit of these trading platforms is their cost efficiency relative to exchanges.") ("BlackRock Viewpoint").

92 See id.

93 See EMSAC Pilot Recommendation, supra note 28, at 5 ("…the Committee does not believe that extending the application of Rule 610(c) to ATSs would be a beneficial part of the pilot given that (i) such limitation does not apply today, (ii) ATSs are not afforded a protected quote, and (iii) ATS transaction fees generally take the form of an institutional commission.").

The Commission requests comment on the trading centers to be included in the proposed Pilot. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

1. The proposed Pilot would apply to all equities exchanges. Should the scope be expanded or reduced? If so, what should the scope be? What would be the anticipated impacts of the revised scope?

2. Should the Commission include taker-maker equities exchanges in the proposed Pilot? Why or why not? What would be the anticipated impact of excluding taker-maker equities exchanges from the proposed Pilot?

3. Should the proposed Pilot be expanded to include ATSs? Why or why not? What would be the anticipated impact of including ATSs in the proposed Pilot? If the proposed Pilot were expanded to include ATSs, should all ATSs be included or only certain ATSs? What, if any, are the potential competitive impacts of excluding ATSs from the proposed Pilot? Would including ATSs in the proposed Pilot have any likely effect on ATS business models? To what extent do ATSs charge fees that are not transaction-based? If the proposed Pilot includes ATSs, how should it apply to ATS fees that are not transaction-based? Also, to apply the proposed Pilot to ATSs, would the Commission need to impose other new requirements on ATSs, such as fee disclosure requirements? If ATSs were to be included in the proposed Pilot, would they be able to collect and report the proposed data[94] or would changes be necessary to accommodate ATSs?

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94 See Section III.E infra for a description of the proposed data.

4. Should the proposed Pilot include options exchanges? Why or why not? What would be the anticipated impact of including options exchanges in the proposed Pilot? How would the quality and extent of the data be impacted by including or excluding options exchanges? What, if any, are the potential impacts, including competitive impacts, of excluding options exchanges from the proposed Pilot? What, if any, are the potential competitive impacts of subjecting options exchanges to fee caps?

B. Securities

The Commission proposes to include in the Pilot all NMS stocks, which includes common stocks and Exchange-Traded Products ("ETPs"), among other securities,[95] with an initial share price at the time the pre-Pilot Period commences of at least $2, an unlimited duration or a duration beyond the end of the post-Pilot Period, and no restrictions on market capitalization (collectively, "Pilot Securities").[96] As discussed below, throughout the duration of the proposed

95 See 17 CFR 242.600(b)(47) (defining "NMS stock"). The Commission notes that although the EMSAC recommended limiting the access fee pilot to common stocks and ETFs, because Rule 610(c) applies to all NMS stocks, and not just common stocks and ETPs (including ETFs), the Commission preliminarily believes it is appropriate to extend the Pilot to all NMS stocks.

96 The EMSAC recommended including ETFs, which are open-end fund vehicles or unit investment trusts that are registered as investment companies under the Investment Company Act of 1940. The Commission's proposal uses the broader term of ETPs, which, in addition to ETFs, also includes trust or partnership vehicles that are not registered under the 1940 Act because they do not invest primarily in securities, as well as Exchange-Traded Notes ("ETNs"). ETNs are senior debt instruments that pay a return based on the performance of a reference asset. Unlike the two other categories of ETPs, ETNs are not pooled vehicles, and they do not hold an underlying portfolio of securities or other assets. See generally Securities Exchange Act Release No. 75165 (June 12, 2015), 80 FR 34729, 34731 (June 17, 2015) (Request for Comment on Exchange-Traded Products). The EMSAC record, including transcripts of EMSAC meetings, does not contain any substantive discussion of the distinction between ETFs and ETPs. However, all such securities are "NMS stocks" subject to Rule 610(c), and the Commission

Pilot, including the pre- and post-Pilot Periods, if a Pilot Security in one of the Test Groups closes below $1, the security would be removed from the Test Group and would no longer be subject to the Pilot pricing restrictions.[97]

While the EMSAC did not specify a minimum price threshold, the Commission is proposing an initial $2 threshold that would apply at the time of the initial Pilot Securities selection, as was done for the Tick Size Pilot. On a continuing basis, the price threshold would be $1, also as was done for the Tick Size Pilot. If a Test Group security's share price closes below $1 at the end of a trading day during the proposed Pilot, it would be dropped from the Test Group and removed from the proposed Pilot.[98] Under Rule 610(c), stocks with quotations of less than $1 are subject to a structurally different fee cap (based on a percentage of the quoted price) than stocks with quotations of $1 or greater (based on a fixed dollar amount),[99] and equities exchanges typically also assess fees differently for stocks priced less than $1 (i.e., based on a percentage of the price rather than a fixed fee amount).[100] Accordingly, the $1 minimum

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preliminarily does not believe there is a meaningful basis to justify excluding any of them from the proposed Pilot. See 17 CFR 242.600(b)(47) (defining "NMS stock"). See also proposed Rule 610T(b)(1)(ii) (defining "Pilot Securities").

97 See also proposed Rule 610T(b)(3)(ii)(D) (concerning the Pilot Securities Change List and the capture of the date on which any Pilot Security closes below $1).

98 See Section III.E.1 infra (discussing the obligations for primary listing exchanges to maintain Lists of Pilot Securities that will be updated as necessary prior to the beginning of trading on each day the U.S. equities markets are open for trading to communicate changes to Pilot Securities). Stocks in the Control Group that close below $1 would be removed from the Pilot. As discussed below, exchanges would be required to record on the Pilot Securities Change Lists the date that a stock closes below $1.

99 While Rule 610(c) imposes a cap of $0.0030 for a protected quotation of $1.00 or more, the cap is 0.3% when the protected quotation is less than $1.00. See 17 CFR 242.610(c).

100 See, e.g., New York Stock Exchange Price List, available at https://www.nyse.com/publicdocs/nyse/markets/nyse/NYSE_Price_List.pdf.

continuing price threshold recognizes those distinctions and avoids applying the proposed Pilot's Test Group fixed dollar fee caps to securities below $1 for which a fixed dollar cap would be incompatible with the current existing percentage-based standards applicable to those securities.[101]

The Commission preliminarily believes that an initial minimum $2 per share price threshold at the time of the initial stock selection captures substantially all NMS stocks while also providing a cushion so that substantially all of the securities selected for each Test Group will remain part of their respective Test Groups for the duration of the proposed Pilot and not be dropped on account of their share price closing below $1 during the Pilot, as it is uncommon for securities priced at $2 or more to fall below $1.[102] This initial threshold also will increase the likelihood that the securities in each Test Group remain the same throughout the entire proposed Pilot, which will provide consistency in the Test Groups and avoid any adverse impact caused by changes to the composition of the Test Groups.[103]

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101 For example, applying Test Group 2's $0.0015 cap to a security priced at $0.25, which currently would be subject to a fee cap of $0.00075 under Rule 610(c) (i.e., 0.3% of $0.25) would be inapposite.

102 Based on data computed from Center for Research on Securities Prices (CRSP), during the last five years (2012-2016), 94.4% of publicly traded common stocks and ETPs had a share price above $2. Of those stocks, only 4.3% dropped below $1 at any point in that period. In addition, NYSE and Nasdaq can initiate delisting proceedings if a security trades below $1 for a certain period of time. See, e.g., NYSE Listed Company Manual Section 802.01C; Nasdaq Equity Rule 5450(a)(1). See also Cboe BYX Rule 14.7(e)(1) (continued listing requirement of a minimum bid price of $1 per share); NYSE Arca Rule 5.2(c) (maintenance requirement of a $5 closing bid price or $3 closing bid price under the alternate listing requirement).

103 Similarly, the requirement that Pilot Securities have an unlimited duration or a duration beyond the end of the post-Pilot Period is intended to avoid selecting stocks that would expire and drop out during the Pilot, which also should provide consistency in the Test Groups and avoid adverse impacts caused by changes to the composition of the Test Groups.

With respect to market capitalization, the EMSAC recommended limiting the pilot to large capitalization stocks with a minimum market capitalization of $3 billion in part to avoid overlap with the Tick Size Pilot, which commenced on October 3, 2016, and is scheduled to last for a two-year period until October 3, 2018.[104] The Commission notes that the Tick Size Pilot may conclude before the proposed Pilot commences, but if not, the Commission believes that the strong support for a pilot in the near term, reflected in the comments summarized above, as well as the proposed Pilot's design, which, as discussed below, would protect the integrity of the data in both pilots, weighs in favor of proceeding expeditiously and not waiting for the Tick Size Pilot to first expire.[105]

The Commission preliminarily believes that a more comprehensive pilot covering all NMS stocks, including those with market capitalizations below $3 billion, would produce a more meaningful dataset to facilitate broader analysis of the impact of transaction fees and rebates across the full spectrum of NMS stocks, including both large market capitalization companies with potentially substantial liquidity and trading activity as well as mid- and small capitalization companies with potentially less trading activity. A broader dataset will, in turn, permit the

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[104] See EMSAC Pilot Recommendation, supra note 28, at 2. See also EMSAC Transcript, April 26, 2016, supra note 36, at 27:7-15 (reflecting the Subcommittee's desire to run the Tick Size Pilot simultaneously with the Pilot without either program impacting the other). See also Investor Alert: Tick Size Pilot Program – What Investors Need to Know, available at https://www.sec.gov/oiea/investor-alerts-bulletins/ia_ticksize.html (summarizing the Tick Size Pilot).

[105] See, e.g., Healthy Markets Letter I, supra note 44, at 5 (noting that "market participants, experts, and policymakers have been clamoring for the Commission to adopt a study to address order routing incentives for years"); RBC Capital Markets Letter III, supra note 44, at 1 ("[T]he sooner that a pilot can be approved and commenced, the sooner the Commission will have the benefit of the pilot's data, and the sooner it can implement needed reforms."); IEX Letter, supra note 44, at 4 ("The EMSAC recommendation was issued more than one year ago, and no one believes that concerns over maker-taker pricing have become less relevant since then. We believe that the time to proceed with the pilot is long past due.").

Commission and researchers to perform more in-depth analyses among different segments of the securities market, which may be more informative than a narrower pilot for evaluations of the various theories for how transaction fees and rebates may impact routing behavior, execution quality, and market quality.

For example, some have suggested that transaction rebates are distortive and unnecessary for liquid large capitalization companies because, to the extent that those securities already trade at spreads no wider than the minimum trading increment, the rebate cannot serve to narrow the quoted spread further and the high fee that offsets the rebate undermines price transparency because a quote at the same displayed price on different equities exchanges (with different levels of fees) less closely reflects the actual net price to trade at any one exchange.[106] The limitation or removal of rebates for liquid large capitalization stocks therefore may be less likely to lead to deterioration in market quality in those securities.[107] On the other hand, some have argued that the beneficial aspects of rebates, including their potential to contribute to narrowing quoted spreads, may outweigh their potential for these distortions in mid- and small capitalization

[106] See, e.g., James Angel, Lawrence Harris & Chester Spatt, "Equity Trading in the 21st Century," Quarterly Journal of Finance 1, (2011), available at https://doi.org/10.1142/S2010139211000067 (noting that "[t]he obfuscation makes it more difficult for traders to recognize the true costs of their trading.") ("Angel, Harris, and Spatt"); Joe Ratterman, Chief Executive Officer, & Chris Concannon, President, BATS, "Open Letter to U.S. Securities Industry Participants Re: Market Structure Reform Discussion," at 1 (January 6, 2015), available at http://cdn.batstrading.com/resources/newsletters/OpenLetter010615.pdf ("BATS Open Letter") (arguing that "[a] substantial reduction in access fees, and their corresponding rebates, would help remove conflicts or a perception of conflicts with respect to those highly liquid securities that no longer require liquidity incentives.").

[107] See, e.g., BlackRock Viewpoint, supra note 91, at 7 ("The value of liquidity and therefore the need for incentives and rebates is not the same across all stocks. Regulators should review whether highly liquid stocks require any rebates at all.").

securities, which can face persistent challenges in attracting liquidity.[108] Accordingly, transaction rebates may facilitate the provision of beneficial liquidity for mid- and small capitalization securities, and may outweigh any negative distortive impact on broker-dealer incentives, market complexity, or price transparency.[109]

To study these possible effects, the Commission believes it is important to gather data on the impact of fees and rebates on stocks of all market capitalizations. While it is possible that some observations from a pilot focused on large capitalization stocks also could be relevant to mid- and small capitalization stocks, it is likely that other observations could be inapposite, and without including smaller stocks in a pilot, the Commission and researchers would lack data to study the impact on them.

Implementing without undue delay a broad pilot that includes stocks of all market capitalizations could potentially cause the Pilot to overlap with the Tick Size Pilot. Although such an overlap may be unlikely, the proposed Pilot has been designed so that, if necessary, it could proceed simultaneously with the Tick Size Pilot without distorting the effects of either pilot.[110] Specifically, as discussed further below, in the event of an overlap each Test Group would be comprised of two subgroups, one of which contains securities included in the Tick Size

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108 See, e.g., BATS Open Letter, supra note 106, at 3 ("…BATS does not believe that highly liquid securities require as great a rebate as less liquid securities….").

109 See id.

110 See Section III.C infra for additional explanation regarding how the Pilot would control for the potential overlap with the Tick Size Pilot. Notably, if the two pilots overlap and the Tick Size Pilot ends before the proposed Pilot (if adopted) ends, the Transaction Fee Pilot's proposed Test Groups would not change. Alternatively, if the two pilots would not overlap at all because the Tick Size Pilot ends before the proposed Pilot (if adopted) commences, then the overlap design discussed below would not be necessary. See Section III.C (noting that each Test Group would remain constant for the duration of the proposed Pilot with only limited exceptions).

Pilot, and one of which does not, enabling the Commission and researchers to identify and control for any possible effects of an overlap.[111] The Commission therefore believes that this proposed Pilot design would protect the integrity of the data in both the proposed Pilot and the Tick Size Pilot, to the extent that the pilots overlap.[112] Staging one transaction fee pilot for large capitalization stocks in the near term (i.e., that does not overlap with the Tick Size Pilot's $3 billion market capitalization threshold) and conducting a separate, subsequent transaction fee pilot for mid- and small capitalization stocks following the conclusion of the Tick Size Pilot also would achieve that objective. However, the Commission preliminarily believes that it is preferable to proceed expeditiously with a broad transaction fee pilot because the data to be collected from the proposed Pilot, and the analyses that will follow, will help inform the Commission and the public on the potential impact of transaction fees and rebates across all segments of NMS stocks.

Further, the Commission preliminarily does not believe that including smaller capitalization stocks in the proposed Pilot should disproportionately harm those issuers, even though it may result in the reduction or elimination of transaction-based rebate incentives[113] that

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111 The proposed overlap structure, which can be seen in Test Groups 1(a), 2(a), and 3(a) reflected in the table below titled "Proposed Pilot Design of the Transaction Fee Pilot for NMS Stocks," is specifically designed to enable comparison between subgroups within a particular Test Group, as well as across Test Groups, to identify any differences between those securities that overlap with the Tick Size Pilot and those that do not.

112 In addition, conducting both pilots simultaneously would increase the amount of data collected while both pilots are active, which may increase the statistical power of tests of the marginal impact of transaction fees or rebates or of different tick sizes. Statistical power refers to the ability for statistical tests to identify differences across samples when those differences are indeed significant.

113 See supra notes 108-109 and accompanying text for an explanation of the beneficial aspects of rebates for mid- and small capitalization securities. See also Section V.C.2.f infra for a discussion of the potential impact of subjecting small-capitalization securities to both the Tick Size Pilot and the proposed Pilot.

would otherwise be used to attract posted liquidity in those stocks on maker-taker exchanges, as discussed above.[114] While the proposed Pilot would reduce or eliminate rebate incentives to transact in those securities on an exchange for certain Test Groups, the proposed Pilot would not impact the ability of an exchange to maintain a "protected quote," which may offset the reduced rebate incentive and continue to serve as an incentive to attract liquidity providers.[115] In addition, the proposed Pilot would reduce exchange transaction fees for certain Test Groups, as discussed below, thereby making it less expensive—and consequently more attractive—to transact in those securities on an exchange, which also may offset the reduced rebate incentive and attract liquidity providers. Accordingly, including in the proposed Pilot smaller capitalization companies that are part of the Tick Size Pilot will allow the Commission to collect data in the near term on the impact of transaction fees and rebates on NMS stocks, including smaller capitalization stocks, which may trade differently than large capitalization stocks and thus may be affected differently by changes to transaction fees and rebates.

The Commission requests comment on the securities to be included in the proposed Pilot. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

5. Is the proposed sample size of securities for the proposed Pilot reasonable? If not, what other selection criteria should be used? What changes should the Commission consider to inclusion or exclusion from the sample set? Should the

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114 See, e.g., EMSAC Pilot Recommendation, supra note 28, at 1 (noting that there may not be "any certain or predetermined outcomes from the pilot, and the net effect of many counterbalancing factors are not believed to be significantly beneficial or detrimental to any single group.").

115 The Commission has a variety of mechanisms to address issues that may arise under the Pilot. See 15 U.S.C. 78mm.

Commission include a narrower or broader universe of securities? In particular, should only common stocks and ETPs be included in the proposed Pilot and should other types of NMS stocks, like rights and warrants, be excluded from the Pilot? Why or why not? Is the proposed selection method for the Pilot reasonable?

6. Is the inclusion of ETPs appropriate? Does the proposed Pilot design account for relevant distinctions between ETPs and other stocks? Should the proposed Pilot exclude ETPs that are not ETFs?

7. If the Commission excludes ETPs from the proposed Pilot, what would be the effects on the quality and extent of data? How would this impact the study?

8. Should other types of securities be included, such as options? Should certain securities be excluded? Why or why not?

9. If the timing of the proposed Pilot appears likely to coincide with the Tick Size Pilot, would it be reasonable to proceed simultaneously with the proposed Pilot? Why or why not? To the extent that there is no overlap between the proposed Pilot and the Tick Size Pilot, the Commission would not retain the overlap design. Do commenters agree with this approach?

10. Is the initial $2 per share threshold reasonable? Why or why not? Is there another level at which this threshold should be set?

11. Is the $1 per share minimum continuing price threshold reasonable? Why or why not? Is there another level at which this threshold should be set?

12. Should the Commission require a minimum market capitalization? If so, what should be the threshold? What would be the impacts of this revised market capitalization threshold?

13. Should the Commission require a minimum trading volume for NMS stocks in the proposed Pilot?

14. What are the likely effects of the proposed Pilot on issuers and capital formation? In particular, are different types of issuers likely to be affected in different ways by the proposed Pilot, and, if so, how?

15. Should issuers be allowed to opt out of the proposed Pilot or would allowing issuers to opt out adversely affect the proposed Pilot? If so, how? What would be the impact on the extent and quality of the data? For example, could it reduce the representativeness of the results obtained from the Pilot, particularly if those issuers that opt out are predominantly one type of issuer (e.g., small or mid-capitalization issuers)? If issuers were allowed to opt out, should only certain types of issuers be allowed to opt out, e.g., small-capitalization stocks or stocks with low levels of liquidity? How should the Commission consider the benefits and costs on the overall Pilot? How should the costs to issuers and shareholders be measured?

C. Proposed Pilot Design

Pursuant to proposed Rule 610T(b)(1), the Commission would designate by notice the initial List of Pilot Securities. That list would place each NMS stock that meets the initial criteria to be a Pilot Security into one of the three proposed Test Groups or into the Control Group. Each of the three Test Groups would be selected through stratified sampling by market capitalization, share price, and liquidity.[116] The composition of each Test Group would remain constant for the duration of the proposed Pilot, except that the exchanges would update this information, as described below, to reflect changes to the composition of the groups caused by mergers, delistings, or removal from a Test Group due to the share price of a stock closing below $1.

Each Test Group would contain 1,000 NMS stocks, with the remainder of eligible NMS stocks to be included in the Control Group. If the proposed Transaction Fee Pilot is adopted and commences before the end of the Tick Size Pilot, the selection of the common stocks for the Transaction Fee Pilot Test Groups would take into consideration the common stocks in the Tick Size Pilot.[117] If the two pilots would not overlap at all because the Tick Size Pilot ends before

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116 Stratified sampling refers to selecting stocks for each Test Group and the Control Group according to predefined criteria. As proposed, the predefined criteria would result in each Test Group and the Control Group containing a group of stocks that, as a group, reflect a similar distribution of market capitalization, share price, and liquidity. For example, when stratifying stocks on the basis of liquidity, each Test Group and the Control Group would have a similar distribution of high, moderate, and low liquidity securities.

117 Specifically, if the two pilots would overlap, then each of the proposed Transaction Fee Pilot's three Test Groups would be divided into two subgroups—one that overlaps with the Tick Size Pilot and one that does not overlap. The subgroups that overlap with the Tick Size Pilot would each contain 270 NMS stocks (45 stocks would be selected from each of the three Tick Size Pilot test groups (45 stocks x 3 Tick Size Pilot groups = 135 total), with the remaining 135 stocks coming from the Tick Size Pilot's control group, for a total of 270 common stocks). The subgroups that do not overlap with the Tick Size Pilot would each contain 730 NMS stocks: 150 large-capitalization common stocks, 100 small- and mid-capitalization stocks that do not overlap with the Tick Size Pilot, 260 ETPs, and 220 other NMS stocks. For purposes of the proposed Pilot, large-capitalization common stocks would be common stocks with market capitalizations above $3 billion and conversely, small- and mid-capitalization common stocks would be those with market capitalizations of $3 billion or less. See Section III.B supra for discussion regarding including securities with market capitalizations above, as well as below, $3 billion in the proposed Pilot. See also proposed Rule 610T(b)(2)(ii)(D) (containing fields for certain types of NMS stocks that would be included in the proposed Pilot). The Commission would select stocks from the pool of securities eligible for the

the proposed Pilot (if adopted) commences, then the overlap design of dividing each group into two subgroups would not be necessary and each Test Group would simply contain 1,000 NMS stocks without subgroups.

The Commission preliminarily believes that this design would be representative of the size of the overall population of NMS stocks and would provide sufficient statistical power to identify differences among the Test Groups with respect to common stocks and ETPs.[118] This selection methodology for the Pilot Securities is intended to help ensure that the proposed Transaction Fee Pilot Test Groups would be similar in composition to each other and to the Control Group, as well as to the composition of the Tick Size Pilot test groups. This proposed design would reduce the likelihood that the proposed Transaction Fee Pilot would cause data issues for the study of the Tick Size Pilot and vice versa.[119]

While the EMSAC limited its recommendation by proposing test groups modeled on the current regulatory structure reflected in Rule 610(c), the Commission instead has preliminarily determined to more broadly study the impact of all transaction fees on order routing behavior, execution quality, and market quality.[120] Including all equities exchanges in the proposed Pilot,

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Tick Size Pilot in the same manner as it selects the stocks that would not overlap with the Tick Size Pilot.

118 See supra note 112 (defining "statistical power"). The Commission preliminarily believes that any reduction in the number of NMS stocks in any particular group could provide less statistical power and thereby affect the conclusions of the Pilot.

119 See Section V.C.1.a.i.A infra. The proposed design ensures that similar proportions of stocks impacted by the Tick Size Pilot would be included in each Test Group of the Transaction Fee Pilot, such that any Tick Size Pilot effects would be uniform across the proposed Pilot. Researchers would therefore be able to control for those effects and minimize any data distortion.

120 The Commission notes that one of the goals of Rule 610(c) was to support the integrity of the price protection requirement established by Rule 611 of Regulation NMS. See NMS

even those with taker-maker fee models, would ensure that the Pilot will collect data on all equities markets that are registered national securities exchanges, whose fees are all subject to the requirements of the Exchange Act and the rule filing requirements thereunder, thus treating equally all similarly situated entities.

In addition, as is the case currently under Rule 610(c), the proposed Pilot would permit equities exchanges to charge varied transaction fees for Pilot Securities within each Test Group, so long as such fees comply with the conditions (including the applicable cap) set for that group. The Commission believes that this would allow equities exchanges to continue to compete for order flow by adjusting their access fees within the bounds of the proposed Pilot.

The Commission is proposing to apply the following pricing restrictions to Test Groups 1, 2, and 3, and the Control Group would remain subject to the current access fee cap in Rule 610(c):

Adopting Release, supra note 1, at 37503 ("Finally and most importantly, the fee limitation of Rule 610 is necessary to support the integrity of the price protection requirement established by the adopted Order Protection Rule. In the absence of a fee limitation, some 'outlier' trading centers might take advantage of the requirement to protect displayed quotations by charging exorbitant fees to those required to access the outlier's quotations. Rule 610's fee limitation precludes the initiation of this business practice, which would compromise the fairness and efficiency of the NMS.").

<table>
<tr><th colspan="6">Proposed Pilot Design of the
Transaction Fee Pilot for NMS Stocks</th></tr>
<tr><th></th><th>Group</th><th colspan="2"># of NMS Stocks</th><th>Fee Cap</th><th>Rebates Permitted</th></tr>
<tr><td></td><td>Control Group</td><td colspan="2">Pilot Securities not in Test Groups 1-3</td><td>Rule 610(c) access fee cap applies</td><td>Yes</td></tr>
<tr><td rowspan="2">Test Group 1</td><td>Test Group 1a (overlap w/ Tick Size Pilot)</td><td rowspan="2">1,000</td><td>270
(45 from each Tick Size Pilot bucket, rest from Tick Size Pilot Control Group)</td><td>$0.0015</td><td>Yes</td></tr>
<tr><td>Test Group 1b (no overlap)</td><td>250 common stocks (150 large, 100 mid/small);
260 ETPs;
220 other</td><td>$0.0015</td><td>Yes</td></tr>
<tr><td rowspan="2">Test Group 2</td><td>Test Group 2a (overlap w/ Tick Size Pilot)</td><td rowspan="2">1,000</td><td>270
(45 from each Tick Size Pilot bucket, rest from Tick Size Pilot Control Group)</td><td>$0.0005</td><td>Yes</td></tr>
<tr><td>Test Group 2b (no overlap)</td><td>250 common stocks (150 large, 100 mid/small);
260 ETPs;
220 other</td><td>$0.0005</td><td>Yes</td></tr>
<tr><td rowspan="2">Test Group 3</td><td>Test Group 3a (overlap w/ Tick Size Pilot)</td><td rowspan="2">1,000</td><td>270
(45 from each Tick Size Pilot bucket, rest from Tick Size Pilot Control Group)</td><td>No Rebates or Linked Pricing (610(c) cap applies)</td><td>No</td></tr>
<tr><td>Test Group 3b (no overlap)</td><td>250 common stocks (150 large, 100 mid/small);
260 ETPs;
220 other</td><td>No Rebates or Linked Pricing (610(c) cap applies)</td><td>No</td></tr>
</table>

1. Test Group 1

For Pilot Securities in Test Group 1, equities exchanges could neither impose, nor permit to be imposed, any fee or fees for the display of, or execution against, the displayed best bid or offer of such market in NMS stocks that exceeds or accumulates to more than $0.0015 per share. The cap in Test Group 1 would apply to transaction fees assessed on the remover (taker) of liquidity as well as transaction fees assessed on the provider (maker) of liquidity.[121]

The EMSAC recommended three test groups, with fee caps of $0.0020, $0.0010, and $0.0002, respectively. The Commission also is proposing three test groups, two with fee caps of $0.0015 and $0.0005, and one that prohibits rebates and Linked Pricing. The Commission preliminarily believes that it is appropriate to test an intermediate reduction in the fee cap. However, because the proposed Pilot includes a no-rebate bucket, the Commission preliminary believes it is preferable to test a cap, set at half of the current $0.0030 cap, rather than two intermediate caps as EMSAC recommended. This approach will allow the proposed Pilot to test more pronounced changes to the status quo without increasing the total number of Test Groups. Accordingly, as discussed below, in addition to the $0.0015 test group, the proposed Pilot also includes a test group of $0.0005 (as proposed Test Group 2) as well as a no-rebate bucket (which EMSAC did not recommend).[122] The Commission preliminarily believes that having a total of three Test Groups would allow the proposed Pilot to test several different scenarios while

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121 In other words, the fee cap in Test Group 1 would apply the cap to the take fee charged to the taker on a maker-taker exchange and also would apply the cap to the make fee charged to the maker on a taker-maker exchange.

122 See infra Section III.C.2 (discussing proposed Test Group 2) and Section III.C.3 (discussing proposed Test Group 3).

avoiding overcomplicating the Pilot and would represent a pilot design with which the exchanges are familiar because it aligns with the Tick Size Pilot's three test groups.[123]

Finally, the EMSAC's proposed first group would have applied its cap only to fees assessed for removing liquidity, which is consistent with the application of Rule 610(c)'s fee cap.[124] As discussed above, the Commission instead is proposing to apply Test Group 1's cap to fees assessed for removing or posting liquidity. In other words, as discussed above, the proposed cap in Test Group 1 would apply to maker-taker pricing as well as taker-maker pricing, which some comments submitted in response to the EMSAC's recommendation supported. The Commission preliminarily believes that applying the cap in Test Group 1 to any fees assessed—including to fees for providing liquidity in a taker-maker pricing model—would help achieve the purpose of the proposed Pilot by applying the test conditions broadly to all equities exchange transaction fees and not just fees for accessing a protected quotation.

2. Test Group 2

For Pilot Securities in Test Group 2, equities exchanges could neither impose, nor permit to be imposed, any fee or fees for the display of, or execution against, the displayed best bid or offer of such market that exceed or accumulate to more than $0.0005 per share. The cap in Test

123 Maintaining three test groups for the proposed Pilot would allow it to align closely with the Tick Size Pilot's three test groups, with which the exchanges are familiar. In addition, the proposed Test Groups have been designed to account for overlap between the two pilots and control for the potential that such overlap could possibly affect the results of the Pilot. See supra Section III.B.

124 See supra note 76 and accompanying text (noting that the Rule 610(c) access fee cap only caps fees for removing a protected quotation).

Group 2 would apply to transaction fees assessed on the remover (taker) of liquidity as well as transaction fees assessed on the provider (maker) of liquidity.[125]

The level of the Commission's proposed cap for Test Group 2 is intended to introduce a materially lower cap than Test Group 1 to further reduce the potential distortion created by current levels of rebates, while continuing to permit, for the preponderance of exchange transaction volume, the ability of an exchange to maintain its net profit on a transaction.[126] Specifically, Test Group 2 would prohibit exchanges from charging more than $0.0005 on one side of a transaction, which means an exchange would only have that amount (or less) to fund the rebate it pays to the other side of the transaction, unless it uses other sources of revenue to subsidize the rebate. Therefore, the Commission expects that Test Group 2's $0.0005 cap would significantly reduce, if not eliminate, the likelihood that an exchange would choose to offer rebates at their current levels for Pilot Securities in this group, while nevertheless retaining the

125 In other words, the fee cap in Test Group 2 would apply the cap to the take fee charged to the taker on a maker-taker equities exchange and also would apply the cap to the make fee charged to the maker on a taker-maker equities exchange.

126 For example, if an exchange's base fee to take liquidity is $0.0030 and its base rebate to provide liquidity is $0.0020, the exchange would earn $0.0010 (net capture rate). The proposed cap for Test Group 2 would allow such an exchange to maintain its current net capture rate on such transaction if it charged both sides $0.0005, though charging both sides of a transaction for Test Group 2 securities would result in a change to the exchange's fee model to a "traditional" pricing structure for those securities. As of December 2017, Nasdaq's base take fee was $0.0030 and its base rebate was $0.0020; NYSE's base take fee was $0.0030 and its base rebate was $0.0014; NYSE Arca's base take fee was $0.0030 and its base rebate was $0.0020; and CboeBZX's base take fee was $0.0030 and its base rebate was $0.0020. See, respectively, http://nasdaqtrader.com/Trader.aspx?id=PriceListTrading2 (Nasdaq), https://www.nyse.com/markets/nyse/trading-info/fees (NYSE), https://www.nyse.com/publicdocs/nyse/markets/nyse-arca/NYSE_Arca_Marketplace_Fees.pdf (NYSE Arca), and https://markets.cboe.com/us/equities/membership/fee_schedule/bzx/ (CboeBZX).

ability of exchanges to compete by offering rebates if they so choose.[127] Accordingly, Test Group 2 is designed to test the impact of materially lower rebates and fees, where the potentially distortive effects of rebates, and the fees used to fund those rebates, is greatly reduced and thereby gather data on the impact of that reduction on order routing decisions, execution quality, and market quality.

3. Test Group 3

For Pilot Securities in Test Group 3, equities exchanges generally would be prohibited from offering rebates, either for removing or posting liquidity, and, as discussed further below, from offering a discount or incentive on transaction fee pricing applicable to removing (providing) liquidity that is linked to providing (removing) liquidity. In addition, for the reason discussed below, Test Group 3 would be unique in that the prohibition on rebates would apply not only to displayed top-of-book[128] liquidity, but also would apply to depth-of-book[129] and undisplayed liquidity.[130] In contrast, Test Groups 1 and 2, like the Rule 610(c) fee cap, only cap fees for the execution of an order against a "protected quotation," which is defined as an

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127 For example, a maker-taker equities exchange might choose to offer a $0.0004 rebate and charge a fee of $0.0005 for stocks in Test Group 2. In this way, exchanges could continue to compete with one another by offering rebates. Compared to current levels of rebates, which may approach the level of the current $0.0030 cap, a rebate of $0.0004, by comparison, would be materially lower.

128 "Top-of-book" means the aggregated best bid and best offer resting on an exchange; in other words, aggregate interest that represents the highest bid (to buy) and the lowest offer (to sell). See 17 CFR 242.600(b)(7) (defining "best bid" and "best offer").

129 "Depth-of-book" refers to all resting bids and offers other than the best bid and best offer; in other words, all orders to buy at all price levels less aggressive than the highest priced bid (to buy) or all offers to sell at all price levels less aggressive than the lowest priced offer (to sell). See 17 CFR 242.600(b)(8) (defining "bid" and "offer").

130 "Undisplayed" refers to resting orders that are "hidden" and not displayed publicly in the consolidated market data. See 17 CFR 242.600(b)(13) (defining "consolidated display" and (b)(60) (defining "published bid and published offer"). See also infra notes 136-139 and accompanying text.

exchange's displayed top-of-book quote.[131] While rebates would be prohibited in Test Group 3, transaction fees for securities in Test Group 3 would remain subject to the current $0.0030 access fee cap in Rule 610(c) for accessing a protected quotation.[132]

While the EMSAC considered recommending a zero-rebate bucket, its recommendation ultimately did not contain such a component.[133] Several commenters argued, however, that a pilot should either ban rebates altogether or include a "no-rebate" test bucket."[134] In light of the current debate surrounding transaction fees and the particular attention paid to the potential conflict of interest presented by the payment of transaction-based rebates, the Commission believes that the proposed Pilot would be substantially more informative with a no-rebate bucket than a pilot without one, because the no-rebate bucket would allow the proposed Pilot to gather data to test the effects of an outright prohibition on transaction-based rebates. Specifically, if rebates create a conflict of interest for broker-dealers when they decide where to route an order to post or take liquidity, and if those conflicts have an effect on order routing behavior, execution quality, or market quality, then only a complete prohibition on rebates will allow the Commission to study directly these conflicts and their effects by observing what would happen in the absence of rebates. While Test Group 2's low cap should reduce the likelihood that a market will offer a material rebate because the cap would limit the market's ability to offset the rebate by charging a slightly higher fee to the other side of the transaction, the possibility exists

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131 See 17 CFR 242.600(b)(58) (defining "protected quotation").

132 In other words, Test Group 3 would prohibit rebates for both posting and taking liquidity, but would remain subject to Rule 610(c), which caps fees for taking liquidity. Test Group 3 would not cap fees for posting liquidity.

133 See EMSAC Pilot Recommendation, supra note 28, at 4. The EMSAC acknowledged that "[c]apping inducements is not an existing component of our market structure." Id.

134 See supra note 48.

that rebates would nevertheless continue to be offered in Test Group 2. The Commission preliminarily believes that to gather data to study potential conflicts of interest presented by the payment of rebates and the effects they may have on order routing behavior, execution quality, and market quality, it is necessary for the proposed Pilot to establish a test group that entirely prohibits the payment of transaction-based rebates—which some believe drive distortions of those items.[135] At the same time, Test Group 3 would not further restrict the ability of equities exchanges to charge for transaction services. By prohibiting all rebates, but not lowering the existing Rule 610(c) fee cap for Pilot Securities in Test Group 3, equities exchanges would no longer need to charge transaction fees at levels priced to offset the rebates they pay, while at the same time they would retain the ability to charge transaction fees as high as the current $0.0030 cap. Accordingly, Test Group 3 is intended to test, within the current regulatory structure, natural equilibrium pricing for transaction fees in an environment where all rebates are prohibited and exchanges do not need to charge offsetting transaction fees on the contra-side to subsidize those rebates.

As proposed, Test Group 3 would prohibit payment of transaction-based rebates broadly for both posting and removing liquidity. In this respect, the Commission notes that Rule 610(c)'s access fee caps do not currently apply to non-displayed liquidity and depth-of-book

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135 See, e.g., supra notes 21 (discussing the potential distortions caused by the conflicts of interest faced by broker-dealers in light of conflicting economic incentives to earn rebates, which typically are not passed through by the broker-dealer to its customers, from the trading centers to which they direct orders for execution); 23 (discussing potential distortions of unnecessary market complexity through the proliferation of exchange order types and new exchanges, the incentive to trade off-exchange to avoid high fees, and the indirect ability to quote in sub-penny increments on a net basis); and 106 (discussing potential distortions caused by the high fees that offset rebates, which can undermine price transparency because a quote at the same displayed price on different exchanges (with different fees) does not reflect the actual net price to trade on any one trading center).

quotes, and exchange fee schedules typically do not impose differing fees based on those parameters.[136] The EMSAC noted a theoretical possibility that lower access fee caps could create an incentive for SROs to begin charging more to access non-displayed interest or depth-of-book quotes. However, such differing fees would lead to uncertainty for market participants that remove liquidity as they would not be able to control with absolute certainty whether they interact with such interest.[137] The Commission preliminarily believes that the prospect of market participant objections to the uncertainty regarding what they would expect to pay to remove liquidity would make this outcome highly unlikely.

However, in Test Group 3, the possibility of an exchange continuing to offer rebates for non-displayed and depth-of-book quotes, while eliminating them on displayed interest, could have the potential to distort the Pilot results to the extent that stocks in Test Group 3 remained

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136 Three equities exchanges do impose differing fees for certain orders based on whether the order is displayed or non-displayed, including: (1) IEX, which incentivizes displayed liquidity by charging a lower transaction fee of $0.0003 for posting or taking displayed interest and imposes a higher fee of $0.0009 per share to post or take non-displayed liquidity; (2) NYSE American, which incentivizes posting of displayed liquidity and imposes a standard fee of $0.0002 per share to remove liquidity or post non-displayed liquidity, though it does offer rebates to eDMMs; and (3) Cboe EDGA, which encourages non-displayed liquidity by not charging transaction fees for posting non-displayed liquidity and charging a low fee to take non-displayed interest, but imposes its standard fee on posting or removing displayed liquidity. See Investors Exchange Fee Schedule, available at https://iextrading.com/trading/fees/; NYSE American Fee Schedule, available at https://www.nyse.com/publicdocs/nyse/markets/ nyse-american/NYSE_America_Equities_Price_List.pdf; and Cboe EDGA Exchange Fee Schedule, available at https://markets.cboe.com/us/equities/membership/fee_schedule/edga/. While these exchanges impose differing fees depending on the displayed nature of interest, none pay rebates uniquely for non-displayed orders or depth-of-book interest, and therefore would not be impacted by the application of Test Group 3's prohibition on the payment of rebates to all interest, including non-displayed liquidity and depth-of-book quotes.

137 For example, a liquidity taker's order could interact with displayed or non-displayed liquidity (or both). If fees differed between them, market participants would face uncertainty when making routing decisions over what transaction fees they would incur.

subject to the potential conflicts of interest associated with rebates on non-displayed and depth-of-book quotes.[138] Accordingly, to avoid any potential distortion from a narrowly-tailored "no rebate" bucket that was subject to exceptions and permitted rebates to continue to be offered on certain interest, the Commission preliminarily believes it is necessary to outright prohibit payment of any and all rebates in Test Group 3, including non-displayed liquidity and depth-of-book interest. Doing so will permit the Commission to gather data on a "no rebate" environment, thereby allowing the Commission to observe directly the impact of rebates on order routing behavior, execution quality, and market quality by observing an environment where transaction-based rebates are not offered and comparing that to the control group where rebates continue to be offered. In turn, this data may inform the Commission about the extent to which rebates offered by equities markets are compatible with broker-dealers executing their customers' orders in the best market.[139]

Finally, in addition to prohibiting rebates, Test Group 3 also would prohibit exchanges from offering a discount or incentive on transaction fee pricing applicable to removing (providing) liquidity on the exchange that is linked to providing (removing) liquidity on the

138 For example, a market participant seeking to take liquidity may have an incentive to route to a taker-maker market that offered rebates for executing against non-displayed interest if the market participant expected to trade both with the full amount of displayed interest and also with non-displayed interest (and thus collect a rebate from interacting with the latter). Alternatively, a liquidity provider could have an incentive to route to a maker-taker market that offered rebates on non-displayed interest if the participant was able to use certain order types to ensure that its order remained non-displayed and executed only as "poster" to earn a rebate. For example, the provider could use a post-only order instruction to ensure that it never takes liquidity (and thus gets assessed a fee) and combine that with an instruction to prevent the order from becoming displayed. In either of these two examples, the market could continue to offer an incentive to earn a rebate on, or by interacting with, non-displayed liquidity, which could distort the results of the proposed Pilot.

139 See 15 U.S.C. 78k-1(a)(1)(C)(iv).

exchange ("Linked Pricing"). For example, for Pilot Securities in Test Group 3, an exchange would be prohibited from adopting any discounts on transaction fees to remove (i.e., "take") liquidity where that discount is determined based on the broker-dealer's posted (i.e., "make") volume on the exchange, which would result in the broker-dealer paying a lower take fee in return for providing a certain level of liquidity on the exchange. However, as discussed further below, exchanges would not be prohibited from adopting new rules to provide non-rebate Linked Pricing to their registered market makers if the non-rebate discount or incentive is in consideration for meeting market quality metrics specified in an exchange rule.

Prohibiting Linked Pricing for Test Group 3 is designed to support the objectives of that Test Group. Specifically, in Test Group 3, the Commission is seeking to obtain information about what would happen in the absence of the incentive created by offering rebates and the potential conflicts of interest they can present, including what would happen to fee levels if they no longer subsidize those rebates. For example, if "taker" transaction fees no longer are used to fund "maker" rebates, an exchange's taker fee would no longer be subject to that potential distortion and could be set at an equilibrium level in response to competition, which could put downward pressure on "taker" transaction fees. Accordingly, Test Group 3 is designed to gather data on the impact of creating an environment where fee levels are not potentially distorted by rebates and rebates do not influence routing.

In support of creating such an environment for Test Group 3, exchanges also would be prohibited from introducing new Linked Pricing models that could possibly perpetuate similar potential distortions that maker-taker and taker-maker pricing models may impose on transaction fees. For example, if an exchange adopts Linked Pricing for Test Group 3 securities, it might offer a discounted transaction fee to remove liquidity only to those market participants that post a certain volume on the exchange. In effect, offering Linked Pricing to market participants in Test Group 3 without first requiring them to meet market quality metrics designed to benefit the overall market could continue to potentially distort transaction fee pricing if the fees are set at a level above their natural equilibrium, within the current regulatory structure, in order to subsidize the Linked Pricing incentive, and also could perpetuate the potential conflicts of interest associated with rebates and order routing.

If, instead of paying rebates, exchanges seek to provide a discount or incentive on transaction fee pricing applicable to removing (providing) liquidity that is linked to providing (removing) liquidity, then equilibrium pricing may not be achieved to the extent that transaction fees are linked in this way. In turn, perpetuating this potential distortion could cloud the Pilot data for Test Group 3 if the Linked Pricing incentive interferes with the proposed Pilot's ability to isolate and analyze the impacts—on both the maker rebate (fee) and the taker fee (rebate)—of eliminating rebates in Test Group 3. Accordingly, the Commission preliminarily believes that prohibiting exchanges from offering not only rebates but also Linked Pricing in Test Group 3 is appropriate to maintain the integrity of Test Group 3 and would facilitate analysis of securities in Test Group 3 consistent with its objective to test the impact of eliminating rebates and the potential distortions that rebates may cause.

While rebates and Linked Pricing would be prohibited broadly for Test Group 3, the Commission proposes to permit an exchange to adopt new rules to provide non-rebate Linked Pricing to its registered market makers during the proposed Pilot in consideration for meeting market quality metrics.[140] Exchanges have an interest in offering incentives to attract broker-

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140 To adopt Linked Pricing for Pilot Securities in Test Group 3 during the proposed Pilot, an exchange would need to propose new market making standards in a proposed rule change

dealers to become registered market makers on the exchange and commit to meet market making standards specified in exchange rules so that the exchange can, in turn, use the liquidity provided by its registered market makers to attract buyers and sellers to the exchange. The Commission preliminarily believes that permitting exchanges to adopt new rules to offer Linked Pricing to market makers for Test Group 3 securities preserves the ability of an exchange to attract market makers through non-rebate incentives and thereby helps maintain the baseline framework for registered market makers against which the effects of the proposed Pilot would be assessed.

4. Control Group

NMS stocks selected as Pilot Securities that are not placed in one of the three proposed Test Groups would be placed in the Control Group, which would be approximately the same size as each of the other three Test Groups combined and have a similar composition.[141] Transaction fees for Pilot Securities in the Control Group would remain subject to the current Rule 610(c) access fee cap. Consistent with Rule 610(c), the Control Group would only cap fees for taking (removing) a protected quotation; it would not apply to fees for posting liquidity or otherwise cap or prohibit rebates. The Commission preliminarily believes that having a control group is vital to test the effects of lower transaction fees in the proposed Test Groups and that a

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filing submitted pursuant to Section 19(b)(2) of the Exchange Act, and also would need to propose the fee incentive it would provide for meeting those standards. For example, an exchange may establish a specified minimum quote size combined with a requirement to be at the national best bid and offer for a designated percentage of the day. In return for meeting those continuous quoting requirements, the exchange might offer its registered market makers a fee discount to remove liquidity.

141 NMS stocks (including ETPs) placed in the Control Group must meet the same selection criteria as those NMS stocks placed in Test Groups 1, 2, and 3 (e.g., the NMS stock must have a share price of at least $2 at the time of selection, must maintain a share price of at least $1 per share to remain in the proposed Pilot, and must have an unlimited duration or a duration beyond the end of the post-Pilot Period).

control group with the current access fee cap would provide an appropriate baseline for analyzing the effect of the proposed Pilot.

In sum, the Commission preliminarily believes that the proposed size and composition of each of the three Test Groups is appropriate to ensure representativeness of the samples as well as sufficient statistical power across the Control and three Test Groups and therefore will produce a robust sample size for analysis that would allow the Commission and the public to reliably examine, compare, and assess the effects of differing transaction fees and rebates to inform future regulatory initiatives in this area. Further, the Commission preliminarily believes that the proposed Pilot design is appropriately tailored to account for potential overlap with the Tick Size Pilot.

The Commission requests comment on the design of the proposed Pilot. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

16. Is the proposed Pilot reasonably designed to evaluate the effect of transaction fees on order routing behavior, execution quality, and market quality? Why or why not? Should the Commission implement an alternative design, and if so, what should it be? What would be the impacts of the alternative design?

17. Are the $0.0015 and $0.0005 fee cap levels reasonable? Should the Commission use different caps, for example $0.0002 or $0.0009 for Test Group 2? Should the Commission use the caps suggested by EMSAC (i.e., $0.0020, $0.0010, and $0.0002)?

18. Rather than cap fees for Test Groups 1 and 2, should the pilot instead focus those Test Groups on rebate restrictions? If so, what restrictions and caps should the Commission impose?

19. Are the proposed restrictions in Test Group 3 on rebates and Linked Pricing reasonable? Why or why not? Is the proposed language in Rule 610T(a) clear? For example, is the phrase "impose, or permit to be imposed" sufficiently clear? If not, what alternative language should the Commission use?

20. If volume or liquidity changed for the Pilot Securities in Test Group 3, how, if at all, would such changes impact institutional traders? What volume or liquidity would be impactful? What would be the impact? For example, if fewer liquidity providers post orders in Test Group 3 Pilot Securities because there is no rebate for them to earn, would institutional traders be more likely to obtain queue priority? Why or why not?

21. If the Pilot data reveals an impact on quoted prices in Test Group 3 where, in the absence of rebates, spreads widen for a certain segment of stocks and ETPs (e.g., those that are moderately liquid), but not others (e.g., those that are highly liquid or those that are highly illiquid), how should the Commission evaluate that impact?

22. Is maintaining the current fee cap of $0.0030 reasonable for Test Group 3, or should the Commission not subject Test Group 3 to the current fee cap in Rule 610(c)? Why or why not? Should the Commission cap fees for Test Group 3 using a different amount?

23. For securities in Test Group 3, where rebates would not be permitted, will competition and market forces produce a market equilibrium that constrains exchange access fees to levels at or below today's current pricing? What do commenters consider to be a reasonable level for exchange transaction fees? If equilibrium transaction fee pricing is achieved, would such forces obviate the need for a fee cap at all? Or would a cap on exchange access fees continue to be necessary to constrain exchange pricing as long as Rule 611 of Regulation NMS imposes order protection requirements applicable to exchanges with protected quotations?

24. Should one or more of the Test Groups eliminate protected quotation status, and thus the order protection requirements of Regulation NMS, for certain securities? Would doing so provide helpful insights into order routing? Why or why not?

25. If analysis of the proposed Pilot data were to suggest that rebates offered by maker-taker exchanges do not affect quoted spreads or contribute to market quality or execution quality for the most actively traded NMS stocks, do commenters believe that the minimum trading increment for those most actively traded stocks should be reduced, for example, to a half-penny? Why?

26. Would there be a sufficient number of stocks and ETPs in each Test Group? Why or why not? Or would fewer stocks and ETPs in each Test Group be capable of providing statistically significant data? If so, how many stocks and ETPs should be included in each Test Group? How would the quality and extent of the data be affected?

27. Should the proposed Pilot overlap with the Tick Size Pilot? If so, does the proposed Pilot design adequately account for potential overlap with the Tick Size Pilot? Why or why not? What are the potential impacts of such overlap for equities exchanges, issuers, and other market participants? How could the Commission better design the proposed Pilot to deal with any overlap between the two pilots?

28. Should Test Group 3's prohibition on rebates and Linked Pricing apply to depth-of-book and undisplayed liquidity? Why or why not? Should the fee caps in the other Test Groups also apply to depth-of-book and undisplayed liquidity? Why or why not?

29. Should the proposed Pilot include a "trade-at" provision that would restrict price matching of protected quotations? Why or why not? How would a "trade-at" component affect the data generated by the proposed Pilot? Should the Commission consider an alternative methodology to evaluate "trade at"?

30. Is the proposed Pilot design subject to any particular limitations with respect to achieving the objectives of the Pilot? Of what kind? How could the proposed Pilot design be improved to prevent such limitations?

31. Should an equities exchange be able to offer rebates in Test Group 1 or 2 in excess of the fees it charges to the contra-side of an execution? For example, should the proposed Pilot prohibit equities exchanges from offering rebates in excess of $0.0015 in Test Group 1 or $0.0005 in Test Group 2? Why or why not?

32. Would increasing transparency for customers into broker-dealer business models and/or trading practices (including, for example, transparency regarding broker-

dealer revenue streams, order routing practices, or other matters) be a more effective way of addressing potential broker-dealer conflicts of interest arising from access fees and rebates?

D. Duration

The Commission is proposing a two-year term for the proposed Pilot, with an automatic sunset at the end of the first year unless, prior to that time, the Commission publishes a notice determining that the Pilot shall continue for up to another year. In addition, as discussed below, the Commission is proposing a six-month pre-Pilot Period as well as a six-month post-Pilot Period. The Commission preliminarily believes this approach will give the Commission flexibility and help ensure its ability to gather sufficient data to reliably analyze the Pilot's impact on order routing behavior, execution quality, and market quality.[142] The Commission believes that providers and takers of liquidity need time to gain experience with the different Test Groups, and the proposed Pilot needs to be long enough to make it economically worthwhile for market participants to adapt their behavior.[143] The proposed Pilot should

142 See EMSAC Pilot Recommendation, supra note 28, at 2. The EMSAC recommended an initial three-month phase-in period involving 10 stocks, after which each Test Group would be expanded to include the remaining securities in each group. See id. at 2. While a phase-in period would allow markets and market participants to implement the required fee changes in a staged manner and provide an opportunity to address unforeseen implementation issues, the Commission believes that markets and market participants are accustomed to dealing with transaction fee changes and therefore should be readily capable of accommodating the terms of the proposed Pilot with the advance notice provided by the Commission's rulemaking process. Further, though exchanges would be required to collect and report certain data, as described below, the proposed Pilot would not require equities exchanges to make any changes to any of their trading systems, and therefore the Commission preliminarily believes a phased implementation schedule would not be necessary to test changes to outward facing systems.

143 See, e.g., EMSAC Transcript, July 8, 2016, available at https://www.sec.gov/spotlight/emsac/emsac-070816-transcript.txt (comments of Joe Mecane noting that "[a]fter further discussion, we thought two years was the right time

continue to collect data over a sufficiently long period of time that is capable of providing a sample that would have adequate statistical power. The Commission would need to observe developments during the proposed Pilot to determine whether to sunset it.

The EMSAC recommended a two-year duration for a pilot, and the Commission's rule incorporates the possibility of a two-year pilot. The Commission believes that a two-year duration, with automatic possible sunset at the end of the first year is preferable because it would provide flexibility as the data from the Pilot develops. To suspend the automatic sunset, under proposed Rule 610T(c), the Commission would publish, no later than thirty days prior to the sunset date, a notice on its website and in the Federal Register. The Commission could suspend the sunset, for example, if it believed that additional time would help ensure that market developments are fully reflected in the data with sufficient statistical power for analysis. The Commission also, for example, could suspend the sunset if the Commission believed that a potentially disruptive event experienced during the first one-year period counsels in favor of conducting the proposed Pilot for its full two-year term. Alternatively, the Commission could leave the sunset in place by not publishing a notice if the one-year period was sufficient to fully reflect market developments and the data collected provides adequate statistical power to analyze those developments.

While the Commission considered proposing a shorter period, such as that recommended by Nasdaq,[144] a shorter duration for the Pilot than the proposal (i.e., less than one year) may allow short-term or seasonal events to unduly impact the Pilot data. For example, if the proposed

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frame, because the behavioral changes that we think that will result from the pilot program will take… some time to filter through the marketplace.").

144 See Nasdaq Letter, supra note 44, at 3.

Pilot were only six months long, the Pilot may or may not produce a sufficiently broad set of data capable of permitting analysis into potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality.

Further, as noted above, Commission is proposing a six-month pre-Pilot Period as well as a six-month post-Pilot Period. The pre-Pilot Period is intended to gather current data to help establish a baseline against which to assess the effects of the proposed Pilot. The post-Pilot Period is intended to help assess any post-Pilot effects following the conclusion of the proposed Pilot. For both the pre- and post-Pilot Periods, the Commission is proposing to require the equities exchanges to publicly post on their websites the same data they would be required to publicly post for the proposed Pilot.

Finally, as noted above, Nasdaq, NYSE, and Cboe have recommended that the Commission, instead of proceeding with a proposal for a transaction fee pilot, first take final action on two of the Commission's proposed rulemakings (disclosure of order handling information and regulation of NMS stock Alternative Trading Systems) and issue additional guidance on broker-dealers' duty of best execution.[145] IEX criticized those recommendations as delaying tactics motivated by "commercial protectionism" from exchanges whose business models are "completely reliant on the payment of rebates."[146] The Commission believes that proceeding with a pilot in the near term would be appropriate as it would complement the Commission's other market structure initiatives and would gather data to inform the Commission

145 See Joint Exchange Letter, supra note 44, at 2-4.

146 See IEX Letter, supra note 44, at 2-3.

and the public on the impact of equities transaction fees and whether additional regulatory action is needed or appropriate.

The Commission requests comment on the proposed duration for the proposed Pilot, including the pre- and post-Pilot Periods. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

33. Is the proposed duration long enough for the proposed Pilot to generate data to analyze the impact of transaction fees? If not, what time period should be selected? Is a different time period preferable?

34. Is the provision for an automatic sunset at the end of the first year unless, prior to that time, the Commission publishes a notice determining that the Pilot shall continue for up to another year, reasonable? What factors or conditions would support continuing the proposed Pilot beyond one year?

35. The EMSAC recommended an initial three-month phase-in period involving a limited number of stocks, after which each test group would be expanded to include the remaining securities in each group. As proposed, the Pilot would not include a phase-in period. Would such a period be useful? Why or why not?

36. Are the proposed pre-Pilot and post-Pilot terms sufficient? Should the Commission select different lengths, or gather different data during those periods? Specifically, instead of a 6 month pre- and post-Pilot Period, should the Commission adopt a 3, 4, or 5 month pre-Pilot and post-Pilot Period? Which, if any, of those is the shortest period that would provide sufficient statistical power for analysis, particularly with respect to ETPs? If the Commission requires at least 6 months of pre-Pilot Period data, to what extent could the exchanges access

and use historical data to populate the required pre-Pilot data described in Section E below? For example, could exchanges access 3 months of historical data such that the pre-Pilot Period could be structured as a 3 month pre-Pilot Period combined with 3 months of historical data immediately preceding that period, for a total of 6 months of cumulative pre-Pilot data? How much time would be necessary for the exchanges to compile 6 months of historical data?

37. Do commenters believe that the Commission should, before taking action on the proposed Pilot, first take final action on the Commission's proposed rulemakings concerning disclosure of order handling information and regulation of NMS stock Alternative Trading Systems, and/or issue new guidance on broker-dealers' duty of best execution, or do commenters agree that proceeding with the proposed Pilot in the near term would complement the Commission's other market structure initiatives?

E. Data

The Commission preliminarily believes that the following data should be collected and made publicly available as described below in order to facilitate the Commission's ability to assess the impact of the proposed Pilot and, as discussed below, promote transparency about the Pilot Securities as well as basic information about equities exchange fees and changes to those fees during the Pilot.[147]

[147] The data and information that is to be made publicly available would be records of the equities exchanges and accordingly, would be subject to the recordkeeping requirements of Rule 17a-1 under the Exchange Act. See 17 CFR 240.17a-1.

1. Pilot Securities Exchange Lists and Pilot Securities Change Lists

As discussed above, proposed Rule 610T(b)(1) would require the Commission to publish on its website a notice containing the initial List of Pilot Securities,[148] which would identify the securities in the proposed Pilot and assign each of them to a designated Test Group (or the Control Group). While proposed Rule 610T does not impose a deadline by which this notice must be published, the Commission preliminarily expects that it would publish this notice approximately one month prior to the start of the Pilot Period.

To account for corporate changes during the proposed Pilot that affect the Pilot Securities, such as name changes, mergers, or dissolutions, proposed paragraph (b) of Rule 610T provides a process to update and publicly disseminate information about changes to the List of Pilot Securities. As discussed and defined further below, the Commission is proposing to require each equities primary listing exchange[149] to publicly post on its website downloadable files containing a list of its primary listed securities included in the proposed Pilot as well as an updated cumulative list of all changes to any Pilot Security for which it serves as the primary

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[148] Proposed Rule 610T(b)(1)(ii) would define "Pilot Securities" for purposes of Rule 610T as the NMS stocks designated by the Commission on the initial List of Pilot Securities pursuant to paragraph (b)(1)(i) of Rule 610T and any successors to such NMS stocks. At the time of selection by the Commission, an NMS stock would be included in the Pilot only if it has an unlimited duration or a duration beyond the end of the post-Pilot Period and a minimum initial share price of at least $2. If the share price of a Pilot Security in one of the Test Groups closes below $1 at the end of a trading day, it would be removed from the Test Group and would no longer be subject to the pricing restrictions set forth in (a)(1)-(3) of proposed Rule 610T.

[149] Proposed Rule 610T(b)(1)(iii) would define "primary listing exchange" for purposes of Rule 610T as a national securities exchange on which an NMS stock is listed. If an NMS stock is listed on more than one national securities exchange, proposed Rule 610T(b)(1)(iii) provides that the national securities exchange upon which the NMS stock has been listed the longest shall be the primary listing exchange.

listing market.[150] An exchange would have to include this information on its website as downloadable files that are freely and persistently available and easily accessible by the general public.[151] In addition, the information must be presented in a manner that facilitates access by machines without encumbrance by user name, password, or other access constraints[152] and the files and information therein could not be subject to any usage restrictions, such as restrictions on access, retrieval, distribution, and reuse. Requiring the exchanges to make this this information freely and publicly available with completely unencumbered access would facilitate the ability of any person to use the information to conduct and make public research and analyses consistent with the purposes of this Pilot.

The Commission believes that it is important to maintain an updated list of Pilot Securities so that market participants can know with certainty throughout the duration of the proposed Pilot the Test Group and/or Control Group assignments for all Pilot Securities, thereby avoiding any confusion over how the proposed Pilot affects the stocks in which market participants trade. Further, it is important to maintain detailed information on historical changes

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150 The Commission notes that the primary listing exchanges maintain public webpages containing similar lists with respect to the Tick Size Pilot. The lists for NYSE and NYSE American listed stocks are available on the NYSE website, available at https://www.nyse.com/tick-pilot. The lists for Nasdaq listed stocks are available on the Nasdaq website, available at https://www.nasdaqtrader.com/Trader.aspx?id=TickPilot.

151 "Persistently available" means that through the end of the required five-year post-Pilot retention period, all data from the Pilot would need to be continually available on each exchange's website. "Accessible" means that the Pilot data posted by each exchange must be able to be indexed by third party query applications and easily found on each exchange's website.

152 Common access constraints may include: "CAPTCHA" (i.e., "Completely Automated Public Turing Test to Tell Computer and Humans Apart") constraints, which commonly provide a challenge-response test to determine whether or not the user is human and block access to the information by machines; user name and password access requirements; user registration requirements; and limitations on downloads.

to Pilot Securities and their associated Test Groups and/or Control Group in order to ensure that market participants, researchers, and the Commission have ready access to definitive information on the Pilot Securities, which will assist the Commission and researchers in analyzing pilot data and assessing and accounting for changes to any Pilot Securities during the duration of the Pilot, including the post-Pilot Period. The Commission believes that the primary listing exchanges, as defined in proposed Rule 610T(b)(1)(iii), are in the best position to provide this information because they oversee their listed issuers and have rules in place that require listed issuers to report corporate change information to them.[153] Accordingly, the primary listing exchanges are made aware of changes relevant to the proposed Pilot for the securities listed on their markets, and therefore are in the best position to disseminate this information by making it publicly available on their websites.

a. Pilot Securities Exchange Lists

As discussed further below, prior to the beginning of trading on the first day of the Pilot Period, proposed Rule 610T(b)(2)(i) would require each national securities exchange that is a primary listing exchange for equities to publicly post on its website downloadable files

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153 See NYSE Listed Company Manual Rule 204.18 (Name Change) (requiring listed issuers to provide notice to NYSE of intended name changes 20 days in advance of the date set for mailing the shareholders' proxy materials dealing with the matter); Nasdaq Listing Rule 5250(e)(3)(A) (Record Keeping Change) (requiring listed issuers to provide notice to Nasdaq of name changes no later than 10 days after the change); NYSE Arca Listed Company Manual Rule 5.3-E(i)(1)(i)(D) (Financial Reports and Related Notices) (requiring listed issuers to notify the Exchange of changes in company name); Cboe BZX Exchange, Inc. Rule 14.6(e)(3)(A) (Record Keeping Change) (requiring listed issuers to provide notice to the Exchange of name changes no later than 10 days after the change); NYSE American Company Guide Sec. 930 (Change of Name) (requiring listed issuers to provide advance notice to the Exchange of intended name changes); IEX Rule 14.207(e)(3)(A) (Record Keeping Change) (requiring listed issuers to provide notice to the Exchange of name changes no later than 10 days after the change).

containing a list, in pipe-delimited ASCII format,[154] of all securities included in the proposed Pilot for which the equities exchange serves as the primary listing exchange (the "Pilot Securities Exchange List"). Proposed Rule 610T(b)(2)(ii) specifies the required fields for the Pilot Securities Exchange Lists, which are: ticker symbol, security name, primary listing exchange, security type (common stock, ETP, preferred stock, warrant, closed-end fund, structured product, ADR, or other), Test Group (1, 2, 3 or Control Group), as well as the date the entry was last updated. The Commission preliminarily believes that this list would contain the essential identifying information necessary to inform market participants and the public about the securities included in the proposed Pilot, and the security type field would permit the Commission and researchers to easily identify subsets of NMS stocks so they can be analyzed separately.

Each primary listing exchange would be responsible for keeping current its Pilot Securities Exchange List to reflect any changes. Specifically, proposed Rule 610T(b)(2)(i) would require the primary listing exchanges to maintain and update their Pilot Security Exchange List, as necessary, prior to the beginning of trading on each business day that the U.S. equities markets are open for trading (also referred to herein as a "trading day"). If a change occurs that alters any of the fields required by Rule 610T(b)(2)(ii), such as ticker symbol, security name, or Test Group, the primary listing exchange for that Pilot Security must update its Pilot Securities Exchange List prior to the beginning of trading on the first trading day for which

[154] The Commission understands that the equities exchanges and market participants have experience utilizing this common file format and will be able to create and make use of lists of Pilot Securities in pipe-delimited ASCII format (also referred to as a "text" file) without difficulty. In particular, the exchanges use this format in the Tick Size Pilot. See Tick Size Pilot Data Collection Securities Files, available at http://www.finra.org/industry/oats/tick-size-pilot-data-collection-securities-files (noting that "[t]he Pilot Securities files are pipe-delimited .txt files.").

such change is effective. The primary listing exchanges would be required to continue to update the Pilot Securities Exchange Lists, as necessary, through to the conclusion of the post-Pilot Period.

b. Pilot Securities Change Lists

In addition, proposed Rule 610T(b)(3)(i) would require each equities primary listing exchange to maintain and publicly post on its website downloadable files containing a list, in pipe-delimited ASCII format, of each separate change applicable to any Pilot Securities for which that primary listing exchange serves or, during the course of the Pilot, has served as the primary listing exchange (the "Pilot Securities Change List"). Proposed Rule 610T(b)(3)(ii) specifies the required fields for the Pilot Securities Change List, which, in addition to the fields required for the Pilot Securities Exchange List, are: new ticker symbol (if applicable); new security name (if applicable); deleted date (if applicable); date the security closed below $1 (if applicable); effective date of the change; and reason for change. The list would be updated by the primary listing exchange to include all changes since the inception of the Pilot, for the Pilot Securities listed on the exchange. Examples of changes that would appear on this list include name changes, ticker symbol changes, mergers, delistings, or removal from a Test Group due to the share price of a stock closing below $1. Each primary listing exchange would be required to update and post its Pilot Securities Change List prior to the beginning of trading on each trading day the U.S. equities markets are open for trading and keep it current through the end of the post-Pilot Period. The Pilot Securities Change List is designed to serve as a cumulative list that provides ready access to all changes to Pilot Securities listed on a particular equities exchange that have occurred subsequent to a primary listing exchange posting its initial Pilot Securities Exchange List on its website.

The Commission believes that market participants and the public would benefit from having access to accurate and up-to-date information on the Pilot Securities and their classification in a particular Test Group or Control Group during the Pilot. As it is possible that changes to some of the Pilot Securities may occur over the course of the proposed Pilot, information about those changes could be useful to broker-dealers and other market participants when making routing and execution decisions. Accordingly, the Commission believes it is important for there to be ready access to relevant updates that impact the Pilot Securities Exchange Lists. Because the primary listing exchanges currently track corporate actions that affect their listed issuers, the Commission believes they are best positioned to disseminate information about those changes as they apply to the securities listed on their markets by making it publicly available on their respective websites.

Further, having access to an updated, cumulative list reflecting all changes to the Pilot Securities will assist the Commission and researchers in analyzing the Pilot data. In particular, ready public access to the record of changes to Pilot Securities and any changes to the applicable Test Groups (or Control Group) that will be reflected in the Pilot Securities Change Lists would provide transparency to the public that the Commission and researchers could use when assessing Pilot data, and also could be useful to market participants, including broker-dealers that route customer orders, to assess and review changes to the lists of Pilot Securities over time.

The primary listing exchanges would be required, pursuant to Proposed Rule 610T(b), to keep the lists publicly posted on their websites beginning with the Pilot Period through the post-Pilot Period, as defined in Proposed Rule 610T(c), and for five years after the end of the post-

Pilot Period.[155] The lists must be easily accessible and freely and persistently available in downloadable form and shall not be subject to any restrictions, including, but not limited to, access or usage restrictions.[156] The Commission preliminarily believes that continued public availability of this information (particularly the Pilot Securities Change Lists) during the Pilot and for several years thereafter would be useful for market participants and the public, including academic researchers, because it would permit changes to the Pilot Securities to be easily tracked for comparison and analysis of the impact of those changes. Accordingly, the Commission expects that researchers would be interested in tracking changes to Pilot Securities over the course of the proposed Pilot, and that there likely would be continued interest in the Pilot Securities Exchange Lists and Pilot Securities Change Lists for some time following the conclusion of the proposed Pilot as researchers analyze the Pilot data and conduct their own independent assessments. Accordingly, the Commission believes that the public would benefit from the primary listing exchanges maintaining the lists they prepare pursuant to Proposed Rule 610T(b) on their public websites for a period of not less than five years following the conclusion of the post-Pilot Period because it would provide for ready access by the public to perform analyses which are likely to occur for several years following the conclusion of the proposed Pilot.

The Commission requests comment on the initial List of Pilot Securities, the Pilot Securities Exchange List, and the Pilot Securities Change List, including the contents thereof and method of publication of that information. In particular, the Commission solicits comment on

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155 While both the Pilot Securities Exchange Lists and the Pilot Securities Change Lists would be required to be publicly posted for five years after the end of the post-Pilot Period, the primary listing exchanges would not be required to continue to update such lists following the conclusion of the post-Pilot Period.

156 See proposed Rule 610T(b)(4).

the following. To the extent possible, please provide specific data, analyses, or studies for support.

38. Should the Commission determine the initial Pilot Securities and specify the Test Group (or Control Group) assignments at a specified minimum period of time prior to the start of the Pilot Period? Is one month sufficient, or should the notice be published closer to the start of the Pilot, such as two weeks prior? For comparison, the Commission selected securities for the Regulation SHO Pilot approximately ten months before the start of the Regulation SHO Pilot and the SROs assigned stocks to test groups one month before the start of the Tick Size Pilot. Does the experience with either of those pilots provide any insight into when the Commission should determine the initial Pilot Securities for the proposed Pilot? Or is it necessary for the Commission to select the Pilot Securities and assign them to groups prior to the pre-Pilot Period? Please explain. What, if any, operational or implementation complexities did market participants experience in relation to the timing of the assignment of securities in the previous pilots?

39. Do the procedures specified in Proposed Rule 610T(b) offer an appropriate framework for maintaining the list of securities for the proposed Transaction Fee Pilot? If not, what other arrangement should the Commission implement? If yes, do any adjustments need to be made to accommodate the proposed Pilot?

40. Is a pipe-delimited ASCII format the appropriate file format for maintaining the Pilot Securities Exchange Lists and Pilot Securities Change Lists? If not, what

other format is more appropriate? Why is such alternate format preferred over a pipe-delimited ASCII format?

41. How long should the rule require that exchanges maintain historical versions of the lists on their public websites for public availability? Is five years appropriate, or should they be maintained on public websites for more or less time?

42. Should the Commission require, in order to make the data more accessible and usable from the exchanges' websites, more automated access to the data? For example, should the Commission require an exchange to make the data publicly available on its website via RSS Feeds[157] and/or APIs?[158] If so, which would be more preferable and why? What would be the benefits? What costs would be associated with such functionality?

43. Are the requirements for posting the required information on a public website, including the prohibition on access and usage restrictions, appropriate to ensure that the public and the Commission will have unfettered access to and be able to use effectively, without encumbrance, the information? Should the Commission impose any other requirements for posting the information? How would usage restrictions impact the ability to analyze the data?

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157 RSS Feeds (Really Simple Syndication) are a type of web feed which allows users to access updates to online content in a standardized, computer-readable format.

158 API (Application Programming Interface) is a set of clearly defined methods of communication between various software components which can make it easier to develop a computer program by providing all the building blocks, which are then put together by programmers.

2. Exchange Transaction Fee Summary

To facilitate analysis of the Pilot data, including the effect that transaction-based fees and rebates have on order routing behavior, execution quality, and market quality, the Commission preliminarily believes that it is necessary for the exchanges to post publicly standardized select data on transaction fees and rebates, including changes to fees and rebates for NMS stocks in each Test Group and the Control Group, as well as average and median realized fees measured monthly.[159] While the proposed Pilot would cap access fees differently in Test Groups 1 and 2, exchanges would have the freedom to set fees at any level below those caps. The Exchange Transaction Fee Summary should facilitate comparison of each exchange's basic fee structure across all equities exchanges and help identify, in summary fashion, changes to those fees.

Because changes to transaction fees and rebates currently are described using Form 19b-4 in individual proposed rule change filings that can be fairly complex, the Commission believes that compiling a dataset of fees and fee changes from Form 19b-4 fee filings alone for use in studying the proposed Pilot would be cumbersome and labor intensive for researchers and may discourage research. Further, the Commission recognizes that exchanges may use unique terminology to describe their fees, which could make comparison of fees across exchanges difficult for a researcher, so the proposal provides for standardized terms to ease comparison across exchanges. The Commission is proposing that exchanges publicly post on their websites in a downloadable file information on their fees (including rebates) and fee changes during the proposed Pilot (including for the pre-Pilot and post-Pilot Periods) using an eXtensible Markup

[159] Some fee changes would not be affected by the proposed Pilot. For example, fixed membership fees, regulatory fees, and connectivity fees that are not assessed by transaction would not fall within the scope of the proposed Pilot.

Language (XML) schema to be published on the Commission's website.[160] Similar to the Pilot Securities lists, discussed above, exchanges would be required to publicly post downloadable files containing the Exchange Transaction Fee Summary, which would require exchanges to post that information on a website that is freely and persistently available and easily accessible by the general public. Further, exchanges would be required to present the information in a manner that facilitates access by machines without encumbrance, and the files and information therein could not be subject to any usage restrictions such as restrictions on access, retrieval, distribution, and reuse.

The Commission preliminarily believes that the unencumbered availability of this data using the proposed XML schema would enhance data quality and facilitate analysis on the correlation between changes in transaction fees and changes in order routing behavior, execution quality, and market quality.[161] There are other alternatives to the Commission proposed XML schema such as CSV and JSON formats. The CSV format provides the most compact file size among the alternatives; however, it also is the least flexible as it cannot convey the same complexity as XML or JSON or directly incorporate validation rules thereby potentially resulting in lower data quality. The JSON format provides a file size similar to XML and can convey

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[160] See proposed Rule 610T(e). The Commission's schema is a set of custom XML tags and XML restrictions designed by the Commission to reflect the proposed disclosures in Rule 610T(e). This requirement does not impact a national securities exchange's obligation pursuant to Section 19(b) of the Exchange Act and Rule 19b-4 thereunder concerning filing a notice of proposed rule change to effectuate a change in transaction fees and updating the schedule of fees posted on the exchange's website to reflect such changes. See supra note 10 (discussing the procedural and substantive requirements applicable to Form 19b-4 fee filings).

[161] See supra Section V.E.4 (discussing the proposed XML format and the limits of using ASCII format for the Exchange Transaction Fee Summary).

complex data structures; however, XML is more widely supported by software packages and applications that are likely to be used by researchers and the public. Therefore, the use of JSON would likely impact reuse and analysis of the data provided by the proposed Pilot.

Accordingly, for the duration of the proposed Pilot, including the pre- and post-Pilot Periods, proposed Rule 610T(e) would require each national securities exchange that trades NMS stocks to compile and post publicly a dataset using an XML schema to be published on the Commission's website that contains specified information on its fees and fee changes that affect each Test Group and the Control Group.[162] Proposed Rule 610T(e) would require the equities exchanges to post on their websites an initial Exchange Transaction Fee Summary before the start of trading on the first day of the pre-Pilot Period and would require the information to be updated through the close of trading on the last day of the post-Pilot Period. During the Pilot, including the pre- and post-Pilot Periods, proposed Rule 610T(e) would require the equities exchanges to update the Exchange Transaction Fee Summary on a monthly basis within 10 business days of the first day of each calendar month to reflect data collected for the prior month.[163]

Proposed Rule 610T(e) specifies the information to be provided in the Exchange Transaction Fee Summary. Specifically, the proposed summary of information relating to fees and fee changes would identify the self-regulatory organization by name ("SRO Name") so that the Commission and researchers would be able to link each exchange to its reported fees.

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162 Because the Pilot Securities would be subject to a continuing minimum share price of $1, the proposed dataset would only contain information on fees applicable to transactions in securities with a per share price $1 or more.

163 Using the month of December 2018 as an example, on or before January 16, 2019, an exchange would be required to post the required information based on data it collected during the previous month of December.

Further, the proposed summary would identify the applicable Pilot Test Group (i.e., 1, 2, 3, or Control), and it would identify the "Base" take fee (rebate), the "Base" make rebate (fee), the "Top Tier" take fee (rebate), and the "Top Tier" make rebate (fee), as applicable.[164] For purposes of the Exchange Transaction Fee Summaries, "Base" fee/rebate refers to the standard amount assessed or rebate offered before any applicable discounts, tiers, caps, or other incentives are applied. Further, "Top Tier" fee/rebate refers to the fee assessed or rebate offered after all applicable discounts, tiers, caps, or other incentives are applied. The Commission preliminarily believes that the Base and Top Tier information would be useful to the Commission and researchers as an approximation of the fee and rebate information that broker-dealers incorporate into their routing decisions, which will be useful in interpreting the Pilot data. For example, the information can be used to help identify and track changes in fees and rebates and the timing of those changes, which can be compared to changes in order routing behavior, execution quality, and market quality.

In addition, proposed Rule 610T(e) would require exchanges to calculate the "average" and "median" per share fees and rebates, which the exchange would compute as the monthly realized average or median per-share fee paid or rebate received by participants on the exchange during the prior calendar month.[165] The summary would require average and median per share fees and rebates to be reported separately for each participant category (discussed below), Test

[164] See proposed Rule 610T(e).

[165] Using the month of December 2018 as an example, on or before January 16, 2019, an exchange would be required to post, among other data, the Base and Top Tier fees and rebates in effect on December 1, any changes to the Base or Top Tier fees and rebates during the month of December, and the average and median per-share fees paid or rebates received by participants on the exchange for the month of December.

Group, displayed/non-displayed, and top/depth of book. The Commission believes the inclusion of average and median figures is helpful as the Base and Top Tier figures are general values and not all broker-dealers would pay or receive those amounts. While Base and Top Tier would be useful to facilitate comparison across exchanges, the addition of average and median figures will provide additional insight into the typical fees paid or rebates received by broker-dealers at each exchange. In turn, this information would be useful to the Commission and researchers analyzing how fees and rebates affect order routing decisions. While the average realized fee or rebate paid/earned by market participants on an exchange can be skewed by extremely large or small values, the median figures would not be affected by such values because median figures reflect the midpoint of values with an equal probability of falling above or below that amount. The Commission preliminarily believes that both the average and median realized fee/rebate figures would be helpful to the Commission and researchers in analyzing Pilot data and the Commission and researchers could incorporate both figures into their analyses, in addition to the Base and Top Tier data, discussed above. For example, a researcher could examine average realized per share fees and rebates when exploring order routing decisions with respect to particular exchanges across broker-dealers. Likewise, a researcher could consider median realized per share fees and rebates when examining the routing decisions of an individual broker-dealer faced with a choice of multiple competing exchanges each with different fees and rebates.

Further, the proposed summary of information would require equities exchanges to report "record type" and "participant type." Specifically, "record type" would be an indicator variable to enable the Commission and researchers to quickly identify whether the fee being reported is an average/median figure, or whether it is the Base or Top Tier fee. Knowing whether a particular fee or rebate is either the Base/Top Tier or average/median would help the

Commission and researchers avoid confusion and provide important clarity in the dataset to facilitate use of the information. The "participant type" also would be an indicator variable and would require exchanges to separately report fees applicable to registered market makers or other market participants. To the extent that an exchange maintains different fees and rebates (e.g., different Base or Top Tier fees or rebates) for market makers compared to other market participants, this indicator variable would allow the Commission and researchers to separately analyze market makers from other participants, which could be valuable when considering the effects of fees and rebates on execution quality and market quality as they impact the incentives on market makers to provide liquidity on specific exchanges. In addition, proposed Rule 610T(e) would require the equities exchanges to identify whether the fees and rebates reported in the summary apply to displayed or non-displayed liquidity or both displayed and non-displayed liquidity and whether they apply to the top or depth of book or to both top and depth of book.[166] These indicator variables will help the Commission and researchers identify whether the fees/rebates reported in the dataset differ between displayed and non-displayed orders or between top and depth of book. If an exchange does differentiate between those conditions in the assessment of fees or provision or rebates, then it would so indicate. Inclusion of this information in the summary of information will allow the Commission and researchers to observe differences at exchanges in fees/rebates to provide or remove liquidity, which could be used to evaluate order routing, execution quality, and market quality.

Finally, proposed Rule 610T(e)(7) and (8) would require the equities exchanges to identify the effective date for each fee (rebate) reported and, when applicable, the end date after

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[166] See proposed Rule 610T(e)(5) and (6).

which the fee (rebate) was no longer in effect.[167] In addition, equities exchanges would report a separate indicator variable to identify when they change fees other than on the first trading day of a calendar month.[168] Specifically, this variable would distinguish whether the average and median values reported in the dataset represent the pre-change average/median or post-change average/median. For example, if an exchange changes its fees on the 15th of a month, then the average and median fees reported before the 15th would be marked to distinguish them from the average and median fees reported on and after the 15th of the month. This indicator variable would be necessary to allow the Commission and researchers to line up the time of reported fee information with observed order routing and execution and market quality information in the Pilot data.

As proposed, each equities exchange would be required to post publicly on its website an initial Exchange Transaction Fee Summary containing the information prescribed in Rule 610T(e) using an XML schema to be published on the Commission's website prior to the start of trading on the first day of the pre-Pilot Period. Pursuant to proposed Rule 610T(e), each equities exchange thereafter would be required to publicly post an updated dataset within 10 business days of the first day of each calendar month and would continue to do so until the end of the post-Pilot Period.

The Commission recognizes that including only the Base fee (rebate), Top Tier fee (rebate), average fee (rebate), and median fee (rebate) ignores significant variation in exchange fee schedules. However, including more granular information on specific individual fees and rebates would complicate the data, could be difficult to standardize across exchanges, and could

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167 See proposed Rule 610T(e).

168 See proposed Rule 610T(e)(10).

potentially make the Pilot more expensive than proposed. Further, the Commission preliminarily believes that the proposed data fields provide sufficient information to assess the range of fees and the variation across exchanges in fees and facilitate analysis of the Pilot data, which otherwise would be challenging to summarize independently and accurately in light of the considerable complexity of exchange fee schedules noted above. Reporting the fee information separately for registered market makers, as a group, and other market participants, as a group, will allow the Commission to separate out the class of market makers to see how changes to fees and rebates impact the fulfillment of their responsibility to provide liquidity. The Commission believes each exchange should summarize this information because each exchange is best able to understand its own fees and unique fee terminology.

The Commission requests comment on the proposed Exchange Transaction Fee Summary proposed in connection with the proposed Pilot. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

44. Is the proposed Exchange Transaction Fee Summary useful to permit comparisons to be made across exchanges? If not, what type of information should be captured?

45. Is having an Exchange Transaction Fee Summary that uses the same XML schema useful when examining the Pilot data? Should the proposed Pilot use an alternative schema? If so, how should the schema change and what would be the impacts of such changes?

46. Are the data elements included in the Commission's proposed schema reasonable? Should any changes be made and what would be the impacts of such changes?

47. What information in the Exchange Transaction Fee Summary is most useful? What additional information in the Exchange Transaction Fee Summary would be helpful? Is any information in the proposed Exchange Transaction Fee Summary not useful and, if so, should it be removed? Please explain. If so, should alternative information be selected instead?

48. Are both "average" and "median" fees useful metrics, or should other measures be selected and what would be the impacts of those alternatives?

49. The proposal would require separate reporting for registered market makers, as a group, and other market participants, as a group. Should further groups be identified? Would customers or professionals be appropriate groups on which to collect fee data?

50. Are monthly updates to the Exchange Transaction Fee Summary appropriate, or should the Commission require the exchanges to post this information more or less frequently and why?

51. Should the Commission require exchanges to report in the Exchange Transaction Fee Summary additional information on proposed rule change filings that change transaction fees reported in the Exchange Transaction Fee Summary? If so, what information should be reported? Would the file number of the exchange's proposed rule change be sufficient, or should links be captured that reference the filing?

52. Should the Commission require the exchanges to specially identify any filing submitted to the Commission that establishes or changes a fee, rebate, or other charge imposed by the Exchange? What form should this identification take? Should the title of the filing require a special identifier? Should the exchanges be required to post a consolidated list of such filings on a publicly available website?

53. Should the Commission require submission of the Exchange Transaction Fee Summaries through EDGAR instead of requiring exchanges to post that information on each individual equities exchange's website? If so, how would this affect the exchange filers and how would it affect users of the Exchange Transaction Fee Summaries?

3. Order Routing Data

To provide public data to facilitate an examination of the impact of the proposed Pilot on order routing behavior, execution quality, and market quality, the Commission proposes in Rule 610T(d) to require throughout the duration of the Pilot, as well as during the pre-Pilot Period and the post-Pilot Period, that each national securities exchange that trades NMS stocks prepare a downloadable file containing sets of order routing data in accordance with the specifications proposed in Rule 610T(d), for the prior month.[169] The data would be in pipe-delimited ASCII format, and be publicly posted on each exchange's website no later than the last day of the following month. As proposed for the lists of Pilot Securities and the Exchange Transaction Fee Summary, exchanges would be required to publicly post downloadable files containing this order routing information. Exchanges would be required to post this information on a website that is

169 For example, by September 30th, an exchange would be required to post the required information containing order routing data for August.

freely and persistently available and easily accessible by the general public. In addition, exchanges would be required to present this information in a manner that facilitates access by machines without encumbrance by user name, password, or access constraints and the files and information therein could not be subject to any usage restrictions, such as restrictions on retrieval, distribution, and reuse. Requiring the exchanges to post and maintain this order routing information with free and completely unencumbered access would facilitate research and analyses consistent with the purposes of this Pilot.

For the pre-Pilot Period, order routing datasets would include each NMS stock. For the Pilot Period and post-Pilot Period, order routing datasets would include each Pilot Security. As discussed below, the order routing data must contain aggregated and anonymized broker-dealer order routing information.[170] Also as discussed below, the required datasets would contain order routing information for liquidity-providing orders and liquidity-taking orders that is aggregated by day, by security, by exchange, and by broker-dealer on an anonymous basis.[171] If the equities exchanges are reporting to the Consolidated Audit Trail ("CAT") at the time the proposed Pilot commences, they would be able to compile the required order routing data by utilizing the data they collect pursuant to the national market system plan ("CAT NMS Plan").[172]

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170 See supra note 154 describing the reasons for requiring data to be provided in pipe-delimited ASCII format. Aggregated order routing data would consist of the cumulative (total) number of orders or shares of orders received, cancelled, executed, or routed to another trading center by order type and order size, accumulated by day, by security, by anonymized broker-dealer, and by exchange, as detailed in proposed Rule 610T(d).

171 See proposed Rule 610T(d).

172 See Securities Exchange Act Release No. 79318 (November 15, 2016), 81 FR 84696 (November 23, 2016) (Joint Industry Plan; Order Approving the National Market System Plan Governing the Consolidated Audit Trail) and CAT NMS Plan Sections 6.3-6.4.

As described in paragraph (d) to proposed Rule 610T, the Commission is proposing that each equities exchange would be required to post publicly two datasets on their websites in pipe-delimited ASCII format. One dataset would include daily volume statistics of liquidity-providing orders by security and by anonymized broker-dealer, separating held and not-held orders. The second dataset would include daily volume statistics of liquidity-taking orders by security and by anonymized broker-dealer, separating held and not-held orders. The specific fields for each dataset as set forth in paragraph (d) to proposed Rule 610T are: code identifying the equities exchange; eight-digit code identifying the date of the calendar day of trading; ticker symbol; unique, anonymized broker-dealer identification code; order type code; order size codes; number of orders received; cumulative number of shares of orders received; cumulative number of shares of orders cancelled prior to execution; cumulative number of shares of orders executed at receiving market center; and cumulative number of shares of orders routed to another execution venue. In addition, the liquidity-providing orders dataset also would require a field specifying the cumulative number of shares executed within certain specified time periods after order receipt by the exchange.

The Commission preliminarily believes that the publicly-available order routing data should provide researchers and the Commission with data necessary to serve the Commission's regulatory purposes in studying the potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality. In particular, the order routing data would contain information about the exchanges to which broker-dealers route orders, which will permit a closer examination of how broker-dealers may change their order routing behavior in response to changes in fees and rebates at each exchange. Because broker-dealers may respond differently to differing levels of fees and rebates and the inherent conflicts of interest fees and rebates present when making routing decisions, the Commission preliminarily believes that data at the broker-dealer level would facilitate statistical analysis of those differences and the conflicts of interest associated with them. The order routing data also would provide valuable information on order type, order size, time to execution, and information on order execution, cancellation, and reroutes, all of which should facilitate analysis into routing behavior in response to differing levels of fees and rebates. In addition, this same information would also facilitate an analysis of the effects that changes to transaction-based fees and rebates may have on execution and market quality by permitting a close examination of matters such as liquidity concentration and competition for order flow among equities exchanges in different fee and rebate environments.

Further, proposed Rule 610T(d) would require during the course of the Pilot, as well as during the pre-Pilot Period and the post-Pilot Period, each national securities exchange that trades NMS stocks to publicly post on its website downloadable files in pipe-delimited ASCII format no later than the last day of each month, sets of order routing data in accordance with the specifications in proposed Rule 610T(d), for the prior month. The Commission is proposing to require the equities exchanges to collect and make available pre-Pilot and post-Pilot data, which would provide necessary benchmark information against which the Commission could assess the impact of the Pilot, and the impact of the Pilot on potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality.

In preparing the datasets, the equities exchanges would be required to anonymize information relating to the identity of individual broker-dealers before making the order routing datasets publicly available. In order to track and aggregate the activity of particular broker-dealers across multiple exchanges, the Commission preliminarily believes it is important for each equities exchange to utilize the same anonymized code to identify a broker-dealer.

Using a single code to identify each unique broker-dealer will allow the Commission and researchers to easily combine the separate exchange data files and sort them by unique broker-dealers, therein allowing the Commission and researchers to identify aggregate activity at the broker-dealer level across all equities exchanges. In turn, the ability to combine and sort all exchange data by anonymized codes representing individual broker-dealers would be useful for capturing and analyzing individual broker-dealer order routing decisions.

In order to facilitate the anonymization of the identities of broker-dealers, representatives of the Commission would provide to the equities exchanges, on a confidential basis, a Broker-Dealer Anonymization Key. The Broker-Dealer Anonymization Key would provide the anonymization code for every broker-dealer whose order routing data would be included in the order routing datasets. The Commission preliminarily believes that it would be most efficient to create the Broker-Dealer Anonymization Key by assigning a unique, anonymized identification code to each central registration depository identifier ("CRD"), which are identifiers of registered broker-dealers known and regularly used by both the Commission and the equities exchanges.[173] To protect the identities of broker-dealers, the Broker-Dealer Anonymization Key would only be accessible to representatives of the Commission and the equities exchanges.

Because proposed Rule 610T would state that the identities of broker-dealers contained in the Order Routing Datasets, and the Broker-Dealer Anonymization Key, are regulatory information, exchanges would not be permitted to access or use that information for any

173 CRD numbers are captured in the Commission's EDGAR system.

commercial or non-regulatory purpose. The Commission considers the identities of broker-dealers in the proposed Order Routing Data, as well as the Broker-Dealer Anonymization Key, to be regulatory information produced for the specific and exclusive purpose of conducting the Pilot, which ultimately will inform the Commission's (as well as exchanges' and the public's) regulatory consideration of the impact of transaction fees on equities market structure. The Commission believes it would be inconsistent with an exchange's rules to use the Broker-Dealer Anonymization Key and the Order Routing Data to benefit its business operations.[174] Accordingly, Rule 610T would expressly prohibit exchanges from accessing or using the Pilot's order routing data for commercial or non-regulatory purposes for reasons including, but not limited to, setting transaction fees, marketing, business development, and customer outreach.[175]

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174 Section 19(g)(1) of the Act requires, in part, that every self-regulatory organization comply with its own rules. See 15 U.S.C. 78s(g)(1). Corporate governance documents for equities exchange holding companies contain rules that restrict the use of information related to an equities exchange's self-regulatory function and do not permit use or disclosure of such information for commercial purposes. See By-laws of Nasdaq, Inc., Article XII, Section 12.1(b), available at http://nasdaq.cchwallstreet.com/NASDAQTools/PlatformViewer.asp?selectednode=chp_1_1_3_6&manual=%2Fnasdaq%2Fmain%2Fnasdaq-corporg%2F; Eighth Amended Bylaws of Intercontinental Exchange Inc., Article VIII, Section 8.1, available at http://ir.theice.com/governance/governance-and-charter-documents; Cboe Global Markets, Inc. and Subsidiaries Code of Business Conduct and Ethics, available at http://ir.cboe.com/~/media/Files/C/CBOE-IR-V2/corporate-governance/code-of-business-conduct-and-ethics-27-oct-2017-adopted.pdf; Bylaws of IEX Group, Inc., Article VII, Section 35, available at https://iextrading.com/docs/governance/IEXG%20Bylaws.pdf; Bylaws of CHX Holdings, Inc., Article III, Section 2, available at http://www.chx.com/chx-holdings/bylaws/.

175 For example, proposed Rule 610T would prohibit an exchange's non-regulatory personnel from having access to the Broker-Dealer Anonymization Key or using that information to decipher the order routing data posted by competing exchanges to learn the identities of those exchanges' biggest customers and then solicit those customers for itself.

The Commission believes that the public availability of the order routing datasets would be useful to allow market participants, researchers, and others to conduct independent analyses of the proposed Pilot and its impacts. To the extent these analyses reveal useful information about the potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality, the Commission believes it would use the resulting analyses for its own regulatory purposes to further inform itself and the public on whether further regulatory action in this area is appropriate.

The Commission requests comment on the order routing-related data to be included in the proposed Pilot. In particular, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

54. What data are necessary to facilitate analysis of the potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality? Are there any specific measures that commenters believe would facilitate that analysis? For example, do commenters agree with the Joint Exchange Letter's recommendation to study the impact on broker-dealers and their customers of savings realized from lowered exchange transaction fees?[176] If so, what data would facilitate that analysis?

55. If the CAT repository was operational, as specified in the CAT NMS Plan, would the Commission have sufficient data to evaluate order routing behavior without

176 See Joint Exchange Letter, supra note 44, at 4.

this Pilot? Does the lack of the CAT affect the costs necessary for this proposed Pilot, and if so how?

56. Should the Commission require the order routing datasets to separate out held and not-held orders? Why or why not? Are there certain shared characteristics regarding the handling of not-held orders, such as a greater likelihood to be directed to particular exchanges, that would be beneficial to assess? Please explain.

57. Should the Commission also require exchanges to separately report non-anonymized datasets to the Commission? If so, what additional data would be useful?

58. Will anonymizing the proposed data sufficiently protect confidential information? Are any further safeguards necessary? Why or why not? Are there other groupings that would be preferable, like aggregation units? If not, what benefits or limitations would there be in analyzing the data if the entirety of a broker-dealer's order routing activity is aggregated?

59. Should the Commission use CRD numbers to create the Broker-Dealer Anonymization Key? If not, why not? Are there other accessible identifying markers that the Commission should use to create the Broker-Dealer Anonymization Key?

60. Would the equities exchanges be able to work with representatives of the Commission to validate the Broker-Dealer Anonymization Key? What additional information, if any, would be helpful for constructing the Broker-Dealer Anonymization Key?

61. Should the Commission require the data to be aggregated at a broader level, such as by groups of similar market participants? Why or why not? Is there a need to aggregate the activity of any market participants to protect their identity? For example, should the identity of large market participants be aggregated? What unique risks are posed for market participants whose trading constitutes a material portion of overall volume? Why would anonymization of a particular broker-dealer not be sufficient for purposes of concealing the broker-dealer's identity? What impact would aggregating order routing data at a broader level have on the ability for the Commission and researchers to assess the impact of the proposed Pilot on order routing behavior, execution quality, and market quality?

62. Should the Commission collect pre-Pilot and post-Pilot data? For how long of a period should it collect such data? Is six months sufficient for each period? Should it collect such data for a shorter period, like three or four months, or a longer period? Should the lengths of the pre-Pilot and post-Pilot Periods be equal, or could the Commission instead collect pre-Pilot data for three months and post-Pilot data for six months and still have adequate statistical power to evaluate the results of the Pilot?

63. Should the Commission require the equities exchanges to both report the datasets to the Commission and make them publicly available on their websites? Is it sufficient to require the equities exchanges to make the datasets publicly available on their websites? To what extent would that reduce the burdens associated with complying with this provision?

F. Implementation Period

The Commission proposes to notify the public through a notice of the start and end dates of the pre-Pilot, Pilot, and post-Pilot Periods, including any suspension of the one-year sunset of the Pilot Period.[177] The start date of the pre-Pilot Period would be one month from the date the Commission issues the notice, and the end date of the pre-Pilot Period would be six months from the pre-Pilot Period's start date. Accordingly, the Pilot, which is to start at the conclusion of the pre-Pilot Period, would begin seven months from the date the Commission issues the notice. The post-Pilot Period would start at the conclusion of the Pilot and would end six months from the post-Pilot Period's start date.

The Commission recognizes that the proposed Pilot will require the equities exchanges to make certain changes to their fees to conform to the proposed terms of the Pilot and will require market participants to adjust their order routing systems in response to those changes. However, because equities exchanges frequently adjust their transaction fees and rebates with little, if any, advance notice to the public through immediately effective Form 19b-4 fee filings, the Commission preliminarily believes that broker-dealers currently are well situated to promptly accommodate any changes required to implement and comply with the proposed Pilot.[178] Such adjustments may be more time-consuming than usual for broker-dealers and other market participants insofar as additional programming may be needed to account for the different fee

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177 See proposed Rule 610T(c). The notice would be posted on the Commission's website.

178 SROs are required to file with the Commission copies of any proposed rule or any proposed rule change. 15 U.S.C. 78s(b)(1). Any proposed rule change establishing or changing a due, fee, or other charge imposed by the self-regulatory organization takes effect upon filing with the Commission. 15 U.S.C. 78s(b)(3)(A)(ii).

and rebate levels across three Test Groups and one Control Group of proposed Pilot.[179] Nevertheless, the Commission preliminarily believes that broker-dealers and other market participants will have time and notice before the onset of the proposed Pilot, including the proposed six-month pre-Pilot Period, to begin to make updates to their trading strategies and execution algorithms, including planning for the prohibition on rebates and Linked Pricing in Test Group 3 and the fact that different stocks will be subject to different fee caps during the proposed Pilot. Thereafter, when the initial List of Pilot Securities is released and the exchanges submit their fee filings, broker-dealers could input those data points into their trading systems in the same manner they do today when exchanges change their fees.

In addition, for the duration of the proposed Pilot and during the pre- and post-Pilot Periods, each equities exchange would be required, pursuant to proposed Rule 610T(d), to post publicly on its website specified datasets of order routing data aggregated by date, ticker symbol, national securities exchange, and broker-dealer. Separately, the equities exchanges also would be required to make changes to accommodate the requirements of proposed Rule 610T(b) concerning publication of information about the Pilot Securities and proposed Rule 610T(e) concerning reports of data on their fees and fee changes.

To provide time for the equities exchanges to make these changes, the Commission proposes that the start date of the pre-Pilot Period would be one month from the date it issues the notice pursuant to proposed Rule 610T(c). Accordingly, the start date of the Pilot Period, which would begin at the conclusion of the pre-Pilot Period, would be no earlier than seven months from the date of the Commission's notice issued pursuant to proposed Rule 610T(c). The

179 See Section V.C.2.b. infra for a discussion of the costs that broker-dealers and other market participants may face in complying with the Pilot.

Commission preliminarily believes that this process should provide sufficient advance notice to the equities exchanges to allow them time to put in place mechanisms to comply with the proposed requirements of Rule 610T and sufficient advance notice to broker-dealers and other market participants to allow them time to put in place any necessary changes to their order routing programming.[180]

The Commission requests comment on the proposed implementation period for the proposed Pilot. Specifically, the Commission solicits comment on the following. To the extent possible, please provide specific data, analyses, or studies for support.

64. Is a one month period following the Commission's notice prior to the start of the pre-Pilot Period sufficient time to allow the equities exchanges to prepare for the pre-Pilot Period requirements? Why or why not?

65. Is a minimum seven month period following the Commission's notice sufficient time to allow affected entities to establish and test mechanisms to comply with the proposed requirements? Why or why not? Should there be an alternate implementation period, such as twelve months? If so, what would be preferable and why?

66. What technological or systems changes are necessary to effectuate the proposed Pilot? How would any such changes differ from changes required to accommodate routine changes in exchange fee schedules?

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[180] See id.

IV. Paperwork Reduction Act

Certain provisions of the proposed rule contain "collection of information requirements" within the meaning of the Paperwork Reduction Act of 1995 ("PRA").[181] 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.[182] 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.[183] The title of the new collection of information is "Transaction Fee Pilot Data."

A. Summary of Collection of Information

1. Pilot Securities Exchange Lists and Pilot Securities Change Lists

As discussed above, the Commission would publish by notice the initial List of Pilot Securities, which would identify the securities in the proposed Pilot and assign each of them to a designated Test Group (or the Control Group).

Prior to the start of trading on the first day of the Pilot Period, proposed Rule 610T(b)(2)(i) would require each national securities equities exchange that is a primary listing exchange for NMS stocks to publicly post on its website a Pilot Securities Exchange List, in pipe-delimited ASCII format, of all Pilot Securities for which it serves as the primary listing exchange. Proposed Rule 610T(b)(2)(i) also would require each primary listing exchange to maintain and update this list as necessary prior to the beginning of each trading day. In addition, proposed Rule 610T(b)(3)(i) would require that prior to the beginning of trading each trading

181 44 U.S.C. 3501 et seq.

182 44 U.S.C. 3507; 5 CFR 1320.11.

183 5 CFR 1320.11(l).

day, a primary listing exchange would be required to publicly post on its website a Pilot Securities Change List, in pipe-delimited ASCII format, that cumulatively lists each separate change to Pilot Securities for which it serves or has served as the primary listing exchange. A proposed set of specifications for both lists is set forth in paragraph (b) of the proposed Rule.

The two lists are intended to make available information about updates to the List of Pilot Securities as well as detailed information on changes to Pilot Securities and their associated Test Groups. Proposed Rule 610T(b) would require both the Pilot Securities Exchange List and the Pilot Securities Change List to be made publicly available on equities exchange websites and remain posted for the duration of the proposed Pilot, including the post-Pilot Period, as well as for five years thereafter. Because the primary listing exchanges oversee their listed issuers and have rules in place that require listed issuers to report corporate change information to them, the primary listing exchanges are in the best position to make this information publicly available.

Further, the Commission believes that market participants and the public would benefit from having access to accurate and up-to-date information on the Pilot Securities and their respective test groups during the proposed Pilot. In addition, access to cumulative detailed information about changes to the Pilot Securities will assist the Commission in analyzing order routing data and will provide information to the public that researchers could use when assessing Pilot data.

2. Exchange Transaction Fee Summary

As discussed above, the Commission preliminarily believes that it is necessary for the exchanges to post publicly standardized and simplified data on the equities exchanges' transaction fees and rebates, and the effective date for any change thereto, individually for each

Test Group and the Control Group.[184] This information is intended to facilitate analysis of the Pilot's order routing data, including the effect that transaction-based fees and rebates have on order routing behavior, execution quality, and market quality.

In particular, while the proposed Pilot would cap access fees differently in Test Groups 1 and 2, exchanges would have the freedom to set fees at any level below those caps. Changes to equities exchange transaction fees and rebates currently are described in individual proposed rule change filings, so compiling a summary of information relating to fees and fee changes from Form 19b-4 fee filings for use in studying the proposed Pilot would be cumbersome and labor intensive for researchers and could discourage research and analysis of the Pilot data. Further, because equities exchanges may use unique terminology to describe their fees, the Commission preliminarily believes the equities exchanges are in the best position to provide this information and ensure that information relating to their fees and rebates and changes thereto is correctly reflected using a common XML schema to facilitate comparison. In addition, only equities exchanges have access to information necessary to compute monthly realized average and median transaction fees, which would be required fields.

Proposed Rule 610T(e) specifies the proposed fields to be required, including information on Base fees and rebates, Top Tier fees and rebates, and monthly realized average and median fees paid or rebates given, each reported separately for registered market makers and other participants.[185] In addition, proposed Rule 610T(e) would require equities exchanges to identify

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184 Some fee changes would not impact or relate to the proposed Pilot. For example, fixed membership fees, regulatory fees, and connectivity fees that are not assessed by transaction would not fall within the scope of the proposed Pilot.

185 Including only the Base fee (rebate), average fee (rebate), median fee (rebate), and the Top Tier fee (rebate) ignores significant variation in exchange fee schedules. However, additional information would complicate the data and could be difficult to standardize

the effective date for each fee (rebate) change reported and, when applicable, the end date after which the fee (rebate) was no longer in effect. It also would require equities exchanges to specify fees and rebates that apply to each Pilot Test Group (or the Control Group), and to what type of participant (market maker or other market participant) they apply. Further, equities exchanges would be required to indicate whether any of the reported fees or rebates are applied differently depending on whether the interest is non-displayed or ranked in the depth-of-book. Finally, as proposed in Rule 610T(e), the equities exchanges would prepare this information and make it publicly available on their websites.

This Exchange Transaction Fee Summary would be intended to facilitate comparison of exchanges' basic fee structures and help identify, in summary fashion, changes to those fees (rebates).

Rule 610T(e) would require each national securities exchange that trades NMS stocks to publicly post this information before the beginning of trading on the first day of the pre-Pilot Period, and update it on a monthly basis thereafter through the close of trading on the last day of the post-Pilot Period.

3. Order Routing Data

Proposed Rule 610T(d) would require each national securities exchange that trades NMS stocks to prepare, in pipe-delimited ASCII format, and publicly post on its website, no later than the last day of each month, specified order routing data containing aggregated and anonymized broker-dealer order routing information for the prior month in accordance with the specifications

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across exchanges. Further, the Commission preliminarily believes that the proposed data fields provide sufficient information to assess the range of fees and the variation across exchanges in fees.

set forth in proposed Rule 610T(d). Such data would be collected throughout the duration of the proposed Pilot, as well as during the pre-Pilot Period and the post-Pilot Period. For the pre-Pilot Period, order routing datasets would include each NMS stock. For the Pilot Period and post-Pilot Period, order routing datasets would include each Pilot Security. As noted above, if the equities exchanges are reporting to the CAT at the time the proposed Pilot commences, the Commission preliminarily believes that they would be able to compile the required order routing data by using the data reported to the central repository. Publicly posting the datasets would provide the Commission, market participants, academic scholars, and the public with order routing data necessary to serve the Commission's regulatory purposes in studying the potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality. In particular, the proposed order routing datasets would contain aggregated order routing data on liquidity-providing and liquidity-taking orders by security, by day, by exchange, and by anonymized broker-dealer, separating held and not-held orders, which should facilitate analysis into order routing behavior in response to differing levels of fees and rebates under the proposed Pilot. Further, in order to construct a dataset that both provides benchmark statistics for the pre-Pilot Period and also captures data to show changes after the end of the proposed Pilot, equities exchanges would provide the required data for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. As proposed, the exchanges would publicly post the order routing datasets on their websites in pipe-delimited ASCII format, which would provide ready access to the data to facilitate analyses of the impact of the proposed Pilot.

B. Proposed Use of Information

The data collected during the proposed Pilot would allow the Commission, market participants, academic scholars, and the public to study the potential conflicts of interest associated with transaction-based fees and rebates and the effects that changes to those fees and rebates have on order routing behavior, execution quality, and market quality. In turn, this information should facilitate a data-driven evaluation of future policy choices.

By publishing and maintaining a Pilot Securities Exchange List and a Pilot Securities Change List, each primary listing exchange would help ensure that the Commission, market participants, academic scholars, and the public have up-to-date information on corporate changes to listed issuers that impact the list of Pilot Securities, as well as changes to the composition of any of the proposed test groups. For example, if a stock undergoes a name change, ticker symbol change, corporate merger, or goes out of business, the primary listing exchanges would help disseminate information necessary to keep current the Pilot Securities Exchange List and the Test Groups into which the Pilot Securities are placed by the proposed Pilot.

The proposed Exchange Transaction Fee Summary containing information on fees and fee changes that affect each Test Group and the Control Group should help facilitate more efficient analysis of the effect that transaction-based fees and rebates, and changes to transaction-based fees and rebates, have on order routing behavior, execution quality, and market quality by facilitating comparison across equities exchanges of each exchange’s basic fee structure and identifying, in summary fashion, changes to those fees. The Commission preliminarily believes that the public availability of this data would facilitate this analysis of order routing data by the Commission, as well as by market participants, academic scholars, and the public.

The proposed collection of order routing data would provide to the Commission and others necessary information on broker-dealer order routing behavior in response to changes in fees and rebates at each exchange, as well as information on order type, order size, time to execution, and information on order execution, cancellation, and reroutes, all of which should facilitate analysis of routing behavior in response to differing levels of fees and rebates and the impact of fee changes on execution quality and market quality. In addition, the collection of data for a pre-Pilot Period would provide an important benchmark against which to evaluate the order routing data collected during the proposed Pilot, and the collection of post-Pilot data would allow analysis of changes to order routing behavior when the proposed Pilot ends. Together, the information on changes and updates to the universe of Pilot Securities, the Exchange Transaction Fee Summary, and the order routing datasets is intended to allow the Commission and others ready access to information to assess whether and in what ways changes to fees and rebates affect market participant behavior and impact the conflicts of interest faced by market participants. In addition to analysis by the Commission, market participants, academic scholars, and the public would be able to use this data for their own studies.

C. Respondents

The respondents to this collection of information would be the equities exchanges, which are registered national securities exchanges that trade NMS stocks. Specifically, Rule 610T(b), which covers the Pilot Securities Exchange Lists and Pilot Securities Change Lists, would apply to the five primary listing exchanges for NMS stocks. Rule 610T(d), which requires datasets on order routing, would apply to all thirteen equities exchanges that are currently registered with the Commission. Rule 610T(e), which requires datasets on fees (rebates) and fee (rebate) changes, would apply to all thirteen equities exchanges currently registered with the Commission.

D. Total Initial and Annual Reporting and Recordkeeping Burdens

1. Pilot Securities Exchange Lists and Pilot Securities Change Lists

After the Commission designates the initial List of Pilot Securities and prior to the start of trading on the first day of the Pilot Period, proposed Rule 610T(b)(2) would require each primary listing exchange to compile in pipe-delimited ASCII format, publicly post on its website, and update as necessary, a list of the Pilot Securities for which the equities exchange serves as the primary listing exchange (i.e., the "Pilot Securities Exchange List"), as well as a list of certain changes to any Pilot Security for which it serves or has served as the primary listing market (i.e., the "Pilot Securities Change List"). Specifically, upon publication of the initial List of Pilot Securities by the Commission, the primary listing exchanges would be required to determine which Pilot Securities are listed on their market and compile and publicly post downloadable files containing a list of those securities, including all data fields specified in proposed Rule 610T(b)(2)(i) on their websites in pipe-delimited ASCII format. The Commission preliminarily estimates that each primary listing exchange would incur, on average, a one-time burden of approximately 8 burden hours per primary listing exchange to compile and publicly post their initial Pilot Securities Exchange List.[186] Accordingly, the Commission preliminarily believes that the aggregate one-time burden associated with the initial Pilot Securities Exchange Lists would be 40 burden hours.[187]

186 The Commission bases this estimate on a full-time Compliance Manager and Programmer Analyst each spending approximately 4 hours, for a combined total of approximately 8 hours, to compile and publicly post to an exchange's website a downloadable file containing the initial Pilot Securities Exchange List.

187 8 burden hours per primary listing exchange x 5 primary listing exchanges = 40 burden hours.

After posting its initial Pilot Securities Exchange List, each equities exchange would be required to keep current that list to reflect any changes, and to prepare and publicly post on its website until the end of the post-Pilot Period the Pilot Securities Change List prior to the beginning of trading each trading day. The Commission preliminarily believes that each primary listing exchange has existing systems to monitor the names of listed companies and process any changes due to mergers, name changes, or other corporate actions, or transfer of a security that closed below $1 per share from a Test Group to the Control Group.[188] Moreover, the Commission preliminarily believes these systems are currently being used to maintain the lists of pilot securities for the Tick Size Pilot, which, as noted above, employs a similar test-group structure and applies to many of the same securities, so the primary listing exchanges already have a process in place to update lists of pilot securities.[189] However, each primary listing exchange would have to adapt these systems as necessary for the proposed Transaction Fee Pilot, notably the fact that the proposed Transaction Fee Pilot would apply to a larger number of securities than does the Tick Size Pilot. Accordingly, the Commission preliminarily estimates that each primary listing market would incur a one-time burden of approximately 12 burden hours of internal legal, compliance, and information technology operations to develop appropriate systems to track and compile changes relevant to Pilot Securities listed on their market for an aggregate one-time burden of approximately 60 burden hours.[190] The Commission preliminarily estimates that, once the primary listing exchanges have established these systems,

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188 See supra note 153 and accompanying text.

189 See supra note 150 and accompanying text.

190 The Commission derived the total estimated burdens from the following estimates: (Attorney at 4 hours) + (Compliance Manager at 4 hours) + (Programmer Analyst at 4 hours) = 12 burden hours. 12 burden hours per primary listing exchange x 5 primary listing exchanges = 60 burden hours.

on average, each primary listing exchange would incur 126 burden hours annually to compile any changes related to Pilot Securities, such as name changes or mergers, and to publicly post the updated Pilot Securities Exchange Lists and Pilot Securities Change Lists on their websites prior to the start of each trading day.[191] Accordingly, the Commission preliminarily estimates an average, aggregate annual burden of 630 burden hours to update and publicly post the lists of Pilot Securities.[192]

2. Exchange Transaction Fee Summary

Proposed Rule 610T(e) would require each national securities exchange that trades NMS stocks to maintain and publicly post on their websites downloadable files, using an XML schema to be published on the Commission's website, data concerning changes in transaction fees (rebates), and the effective date for each fee (rebate) change, for securities subject to the proposed Pilot. The Exchange Transaction Fee Summary would be required to be posted on the equities exchanges' websites before the start of trading on the first day of the pre-Pilot Period through the close of trading on the last day of the post-Pilot Period. Proposed Rule 610T(e) would require equities exchanges to update this summary of information within ten business days following the beginning of each calendar month. Proposed Rule 610T(e) specifies the proposed fields to be required, including, among other things, information on Base fees and rebates, average and median per share fees paid or rebates given, and Top Tier fees and rebates, each reported separately for registered market makers and other participants. In addition,

[191] The Commission bases this estimate on a full-time Compliance Manager and Programmer Analyst together spending approximately 30 minutes per trading day updating and posting the required lists (approximately 252 trading days x 30 minutes per trading day = 7,560 minutes (126 hours)).

[192] 126 burden hours per primary listing exchange x 5 primary listing exchanges = 630 burden hours.

proposed Rule 610T(e) would require equities exchanges to specify whether the fees (rebates) reported in the summary apply to displayed or non-displayed orders or between top and depth of book. Finally, the proposed rule would require equities exchanges to identify the effective date for each fee (rebate) change reported, including, when applicable, an indicator to flag instances where an equities exchange has changed fees other than on the first trading day of a calendar month and the end date after which the fee (rebate) was no longer in effect. It also would require exchanges to specify fees that apply to each Pilot Test Group (or the Control Group), and to what type of interest the fees apply.[193]

The Commission is proposing to require that each equities exchange publicly post on its websites the Exchange Transaction Fee Summary each month, using an XML schema published on the Commission's website. The Commission preliminarily believes that all the data necessary to complete the summary are currently maintained by the equities exchanges. However, the equities exchanges would be required to compute the monthly realized average and median per share fees and rebates, using fee and volume information that the equities exchanges maintain. The Commission preliminarily estimates that each equities exchange would incur a one-time burden of approximately 80 burden hours of internal legal, compliance, information technology,

193 In addition, the Commission anticipates that each equities exchange would submit one Form 19b-4 fee filing to implement the proposed Pilot and one Form 19b-4 fee filing at the conclusion of the proposed Pilot to remove the required pricing restrictions. Each equities exchange might also choose to submit additional Form 19b-4 fee filings during the proposed Pilot. While such filings may impose certain costs on the equities exchanges, those burdens are already accounted for in the comprehensive Paperwork Reduction Act Information Collection submission for Form 19b-4. See OMB Control No. 3235-0045 (August 19, 2016), 81 FR 57946 (August 24, 2016) (Request to OMB for Extension of Rule 19b-4 and Form 19b-4 PRA). The Commission does not expect the baseline number of Form 19b-4 fee filings to increase as a result of the proposed Pilot, nor does it believe that the incremental costs outlined in Section V.C.2.a exceed those costs used to arrive at the average costs and/or burdens reflected in the Form 19b-4 PRA submission.

and business operations to develop appropriate systems for tracking fee changes, computing the monthly averages, and formatting the data and posting it on its website in accordance with the proposed rule.[194] Therefore, the Commission preliminarily estimates that the average one-time initial aggregate burden for all equities exchanges necessary for the development and implementation of the systems needed to capture the transaction fee information and post it on their websites in the specified format in compliance with proposed Rule 610T(e) would be 1,040 hours.[195]

Once an equities exchange has established the appropriate systems required for compiling, formatting, and publicly posting the Exchange Transaction Fee Summary in the specified format, the Commission preliminarily believes that it would be necessary for each equities exchange to monitor its systems to ensure its technology is up to date and reporting the required data in accordance with proposed Rule 610T(e). The Commission preliminarily estimates that, on average, an equities exchange would incur an ongoing burden of approximately 40 burden hours per year to monitor and, if necessary, update its systems used for compiling, formatting and publicly posting the Exchange Transaction Fee Summaries in

[194] The Commission preliminarily estimates that an equities exchange would assign responsibilities for review and potential modification of its systems and technology to an Attorney, a Compliance Manager, a Programmer Analyst and a Senior Business Analyst. The Commission estimates the burden of reviewing and potentially modifying its systems and technology to be as follows: (Attorney at 20 hours) + (Compliance Manager at 20 hours) + (Programmer Analyst at 20 hours) + (Business Analyst at 20 hours) = 80 burden hours per equities exchange. See Securities Exchange Act Release No. 76624 (Dec. 11, 2015), 80 FR 79757, 79771 fn. 93 (Dec. 23, 2015) (SBS Taxonomy Proposing Release) (estimating the types of employees that would retain responsibility for modifying technology systems).

[195] 80 burden hours per equities exchange x 13 equities exchanges = 1,040 burden hours.

accordance with the proposed Rule.[196] Therefore, the Commission preliminarily estimates that the average aggregate, ongoing, annual burden for all equities exchanges to monitor their systems would be 520 hours.[197]

Under the proposed rule, the equities exchanges would be required to format, calculate certain figures and post their initial Exchange Transaction Fee Summary at the outset of the pre-Pilot Period. As this would be the first time an equities exchange would be required to produce and post on their website such a summary, the Commission preliminarily estimates that it would require approximately 4 burden hours for each equities exchange to complete the initial Exchange Transaction Fee Summary and perform the necessary calculations.[198] In addition, each equities exchange would be required to make its summary publicly available on its website using an XML schema to be published on the Commission's website. As discussed below, the Commission preliminarily believes that the equities exchanges have experience applying the XML format to market data.[199] However, the Commission preliminarily believes that initially each equities exchange would incur a burden specific to the initial Exchange Transaction Fee Summary to ensure that it has properly implemented the XML schema. Therefore, the Commission preliminarily estimates that each equities exchange would incur a burden of 2 burden hours related to post the initial Exchange Transaction Fee Summary publicly on its

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196 Total estimated burdens which reflect the Commission's preliminary view that annual ongoing burdens would be approximately half the burdens of initially ensuring it has the appropriate systems to capture the required information in the required format: (Attorney at 10 hours) + (Compliance Manager at 10 hours) + (Programmer Analyst at 10 hours) + (Senior Business Analyst at 10 hours) = 40 burden hours.

197 40 burden hours per equities exchange x 13 equities exchanges = 520 burden hours.

198 The Commission derived the total estimated burden from the following estimates: (Compliance Manager at 2 hours) + (Senior Business Analyst at 2 hours) = 4 burden hours per equities exchange.

199 See infra notes 364-366 and accompanying text.

website using the XML schema to be published on the Commission's website.[200] Accordingly, the Commission preliminarily estimates that equities exchanges would incur, in aggregate, an initial burden of 52 hours to complete their initial Exchange Transaction Fee Summary[201] and an initial burden of 26 hours to post that dataset publicly on their websites using an XML schema to be published on the Commission's website, for a total aggregate, initial burden of 78 burden hours.[202]

In addition, each equities exchange would be required to update the Exchange Transaction Fee Summary on a monthly basis to account for changes from the prior month, if any, and to report monthly realized average median fee and rebate information. The Commission preliminarily believes that such updates would require fewer burden hours, as the equities exchanges would have experience calculating necessary data and formatting the reports as required by the proposed Rule. Accordingly, the Commission preliminarily estimates that it would require approximately 2 burden hours each month, or 24 burden hours on an annualized basis, for each equities exchange to update.[203] This estimate contemplates the impact of publicly posting the summary using the XML schema to be published on the Commission's website. Accordingly, the Commission preliminarily estimates that equities exchanges would incur, an

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200 The Commission derived the total estimated burden from the following estimates, which reflect the Commission's preliminary belief that the equities exchanges have experience posting information in an XML format on publicly-available websites: (Compliance Manager at 1 hour) + (Programmer Analyst at 1 hour) = 2 burden hours per equities exchange.

201 4 burden hours per equities exchange x 13 equities exchanges = 52 burden hours.

202 2 burden hours per equities exchange x 13 equities exchanges = 26 burden hours.

203 The Commission derived the total estimated burden from the following estimates: (Compliance Manager at 1 hour) + (Programmer Analyst at 1 hour) = 2 burden hours per equities exchange per month. 2 burden hours per equities exchange per month x 12 months per year = 24 burden hours per equities exchange per year.

aggregate, annual burden of 312 burden hours to publicly post on their websites the Exchange Transaction Fee Summaries.[204]

3. Order Routing Data

Proposed Rule 610T(d) would require each national securities exchange that trades NMS stocks to prepare, in pipe-delimited ASCII format, and publicly post on its website, no later than the last day of each month, specified data containing aggregated and anonymized broker-dealer order routing information for the prior month in accordance with the specifications set forth in proposed Rule 610T(d). Such data would be collected throughout the duration of the Pilot, as well as during the six-month pre-Pilot Period and the six-month post-Pilot Period. For the pre-Pilot Period, order routing datasets would include each NMS stock. For the Pilot Period and post-Pilot Period, order routing datasets would include each Pilot Security. In preparing the order routing datasets, the equities exchanges would be required to anonymize information relating to the identity of individual broker-dealers before making the datasets publicly available. This anonymization would be achieved through the use of an anonymization key developed by the Commission, using CRDs.[205]

The Commission preliminarily estimates that, on average, there would be no paperwork burden to the equities exchanges to capture the required order routing data, as the Commission expects that the equities exchanges would collect the required data to create the order routing datasets through existing systems and technology already in place for the collection and reporting of data pursuant to the CAT NMS Plan. Furthermore, the Commission notes that the equities exchanges currently generate similar monthly datasets pursuant to Rule 605 of

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204 2 burden hours per equities exchange x 13 equities exchanges x 12 monthly updates = 312 burden hours per year.

205 See supra Section III.E.3.

Regulation NMS.[206] Accordingly, the Commission preliminarily believes that the equities exchanges would be able to leverage existing systems and technology utilized for Rule 605 reporting purposes to create the proposed monthly order routing datasets. The Commission preliminarily believes, however, that the equities exchanges would incur an initial one-time burden of 80 burden hours per equities exchange to ensure that its systems and technology are able to accommodate the proposed requirements to aggregate, anonymize, and publicly post the order routing information.[207] Accordingly, the Commission preliminarily estimates that the aggregate one-time initial burden for ensuring its systems and technology are able to aggregate, anonymize, and post the required order routing data in compliance with proposed Rule 610T(d) would be 1,040 burden hours.[208]

Once an equities exchange has determined that it maintains the appropriate systems and technology required for aggregation, anonymization, and posting of the required information, the Commission preliminarily believes that it would be necessary for each equities exchange to undertake ongoing efforts to ensure that their systems and technology are up to date so that the equities exchange may remain in compliance with the proposed Rule. These efforts could include personnel time to monitor the posting of the required data and the maintenance of the systems necessary to post the required data. The Commission preliminarily estimates that, on

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206 See 17 CFR 242.605.

207 The Commission preliminarily estimates that an equities exchange will assign responsibilities for review and potential modification of its systems and technology to an Attorney, a Compliance Manager, a Programmer Analyst and a Senior Business Analyst. The Commission estimates the burden of reviewing and potentially modifying its systems and technology to be as follows: (Attorney at 20 hours) + (Compliance Manager at 20 hours) + (Programmer Analyst at 20 hours) + (Senior Business Analyst at 20 hours) = 80 burden hours per equities exchange. See supra note 194.

208 80 burden hours per equities exchange x 13 equities exchanges = 1,040 burden hours.

average, it would take an equities exchange approximately 40 burden hours per year to ensure that the systems and technology are up to date so as to facilitate compliance with the proposed Rule.[209] Therefore, the Commission preliminarily estimates that the aggregate annual burden to maintain the systems necessary to aggregate, anonymize, and post the required order routing information to be approximately 520 burden hours per year.[210]

In addition, each equities exchange would incur an ongoing burden associated with creating and formatting the order routing datasets to be publicly posted each month. The equities exchanges have experience with creating similar datasets in accordance with their obligations under Rule 605 of Regulation NMS. The Commission preliminarily believes that each equities exchange would incur burdens similar to those associated with preparing Rule 605 reports.[211] Accordingly, the Commission preliminarily believes that each equities exchange would incur a burden of six burden hours per month, or 72 burden hours per year, to prepare and publicly post on its website the order routing datasets.[212] Therefore, the aggregate, annual burden to publicly post on their websites order routing datasets in accordance with proposed Rule 610T(d) would be approximately 936 burden hours.[213]

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209 The Commission derived the total estimated burdens from the following estimates, which reflect the Commission's preliminary view that annual ongoing burdens would be approximately half the burdens of initially ensuring it has the appropriate systems to capture the required information in the required format: (Attorney at 10 hours) + (Compliance Analyst at 10 hours) + (Programmer Analyst at 10 hours) + (Business Analyst at 10 hours) = 40 burden hours per equities exchange.

210 40 burden hours per equities exchange x 13 equities exchanges = 520 burden hours.

211 See FR Doc. 2016-08552, 81 FR 22143 (April 14, 2016) ("Request to OMB for Extension of Rule 605 of Regulation NMS").

212 Compliance Manager at 3 hours + Programmer Analyst at 3 hours = 6 burden hours per month, per equities exchange. 6 burden hours per month x 12 months = 72 burden hours per year, per equities exchange.

213 72 burden hours per year x 13 equities exchanges = 936 burden hours.

E. Collection of Information is Mandatory

Each collection of information discussed above would be a mandatory collection of information.

F. Confidentiality of Responses to Collection of Information

The Pilot Securities Exchange List, Pilot Securities Change List, Order Routing Datasets, and the Exchange Transaction Fee Summary would not be confidential. Rather, each would be publicly posted by the exchanges. With respect to the Order Routing Datasets, the equities exchanges would anonymize the data they collect under Proposed Rule 610T(d) before publicly posting it on their respective websites.

G. Retention Period for Recordkeeping Requirements

National securities exchanges would be required to retain records and information pursuant to Rule 17a-1 under the Exchange Act.[214]

H. Request for Comments

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

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

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

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

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[214] 17 CFR 240.17a-1. See also supra note 147.

70. 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.

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 S7-05-18. 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 S7-05-18 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.

V. Economic Analysis

As explained above, the proposed Transaction Fee Pilot is designed to produce information on the effect of transaction-based fees on order routing decisions by broker-dealers, as well as execution and market quality.[215] In recent years, a number of academics and market

[215] Execution quality generally refers to how favorably customer orders are executed. Execution quality measures are similar to liquidity measures and tend to include transaction costs, the speed of execution, the probability that the trade will be executed, and the price impact of the trade. See NMS Adopting Release, supra note 1, at 37513-15, 37537-38. Market quality encompasses execution quality but also relates more generally to how well the markets function. Market quality measures include liquidity, price discovery, and volatility in prices. See, e.g., Henrik Bessembinder, "Trade Execution Costs and Market Quality after Decimalization," Journal of Financial and Quantitative

participants have expressed concern that the structure of transaction-based fee pricing may lead to potential conflicts of interest between broker-dealers and their customers when brokers-dealers route customer orders to trading centers offering large rebates so that the broker-dealer can capture the rebates, even when these venues do not offer high execution quality.[216] However, as discussed in more detail below, the Commission cannot determine from existing empirical evidence the impact, if any, of transaction-based fees on order routing decisions by broker-dealers. Specifically, determining whether a causal relationship between exchanges' choice of transaction-based fees and broker-dealers' routing decisions is complicated because transaction-based fees and order routing decisions could be jointly determined and order routing decisions could influence fees just as fees could influence order routing decisions. Currently available data do not permit researchers to isolate these factors and thus identify the existence or direction of such a causal relationship, which in turn impedes researchers' ability to determine the extent to which conflicts may exist.[217] Moreover, the identification of potential causal

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Analysis 38, 747-777 (2003) available at https://doi.org/10.2307/4126742; Maureen O'Hara and Mao Ye, "Is Market Fragmentation Harming Market Quality?", Journal of Financial Economics 100, 459-474 (2011) available at https://www.sciencedirect.com/science/article/pii/S0304405X11000390.

216 See, e.g., Angel, Harris and Spatt, supra note 106; Battalio Equity Market Study, supra note 22; Harris, supra note 23.

217 As proposed, the Transaction Fee Pilot would require the exchanges to make data available to the Commission and the public. Raw data provided by the Transaction Fee Pilot are likely to be used by a subset of academic and regulatory researchers (hereafter "researchers") to develop analyses and discussion about the effects of transaction-based fees and rebates on order routing decisions, which could provide valuable information to the public and to the Commission.

relations between fees and order routing decisions becomes increasingly complex as exchanges modify their fees.[218]

Because of the existing lack of empirical evidence regarding these potential conflicts of interest, additional information would assist the Commission in making regulatory decisions about whether and how to address transaction-based fees and rebates. To remedy the insufficiency of existing empirical evidence, the Commission is proposing a Transaction Fee Pilot, which would provide the Commission and the public with data currently unavailable to study fees and rebates that exchanges assess to broker-dealers and observe the effects of potential conflicts of interest that could arise between broker-dealers and their customers in connection with these fees. Specifically, the Commission expects that these data are likely to shed light on the extent, if any, to which broker-dealers route orders in ways that benefit the broker-dealer but may not be optimal for customers. The data obtained from the proposed Transaction Fee Pilot would inform any possible future regulatory action that addresses these potential conflicts of interest to the ultimate benefit of investors. In addition, the proposed Transaction Fee Pilot data would also provide information about other potential economic effects of reducing access fee caps or prohibiting rebates or Linked Pricing. For example, the proposed Transaction Fee Pilot could offer information on whether prohibiting rebates or Linked Pricing alters broker-dealer behavior in a manner that affects market quality. Specifically, the proposed Pilot may provide

218 Over the last five years, U.S. equities exchanges, on average, have made 34 revisions, or approximately 6.7 revisions per year, to their transaction-based fees and rebates. In contrast to these changes, which are at the discretion of the exchanges and subject to Commission review, the proposed Transaction Fee Pilot would impose a change to access fees and rebates outside of the exchanges' control. See Section V.B.2.b infra.

information on how rebates affect quoted spreads, particularly for small and mid-cap securities, as well as how changes to fees affect order flow among trading centers.[219]

The proposed Transaction Fee Pilot would permit the study of whether conflicts of interest exist by (1) providing an exogenous shock to transaction-based fees and rebates, and (2) enabling the collection of representative results of data across a broad range of securities.[220] An exogenous shock is an unpredictable or unexpected event that is outside of the economy or the system (i.e., not under the control or influence of those being studied) but can induce endogenous (i.e., within the system) responses. In the context of this proposed rule, the exogenous shock would take the form of either a reduction of the maximum permissible access fees or a prohibition on rebates or Linked Pricing paid by all U.S. equities exchanges. This shock would allow the Commission and others to explore how exogenous changes to fees and rebates could lead to changes in the ways in which broker-dealers route customer orders for a broad sample of NMS securities. Specifically, the reduction in fees or elimination of rebates or Linked Pricing, as required in specific test groups of the proposed Pilot, may reduce the magnitude of a potential conflict of interest between broker-dealers and their clients caused by transaction-based fees and rebates. A reduction in this potential conflict of interest would, in turn, be reflected in measurable changes to broker-dealer order routing decisions.

As discussed in Section III.C, the proposed Pilot would span a two-year period, with an automatic sunset at the end of the first year unless, prior to that date, the Commission publishes a

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219 See Section V.C.1.a.ii infra, for further discussion of the benefits of studying other economic effects of transaction fees and rebates.

220 See Section V.B.1 infra, for discussion of existing studies related to these topics and their limitations. See also Section II.B supra, for details of the Nasdaq study, which examined a change in the access fees and rebates charged by Nasdaq for 14 stocks over a four-month period.

notice determining that the proposed Pilot shall continue for up to another year,[221] and would apply to both maker-taker and taker-maker exchanges. All NMS stocks (including ETPs) that have prices of at least $2.00 at the time of selection would be included in the proposed Pilot and would be segmented into three test groups and one control group. Each test group would contain a mix of stocks and ETPs, stratified based on variables such as market capitalization, share price, and liquidity.[222] Under the requirements of the proposed Pilot, the exchanges could not charge any access fee or, where applicable, provide rebates or Linked Pricing, in excess of the limitations indicated by the proposed Pilot. Stocks and ETPs in Test Groups 1 and 2 would be restricted to maximum fees of $0.0015 and $0.0005 (with no restrictions on rebates), respectively, while Test Group 3 would eliminate the exchanges' ability to provide rebates to liquidity providers on maker-taker exchanges and liquidity takers on taker-maker exchanges for both displayed and non-displayed liquidity and would prohibit Linked Pricing. Both the Control Group and Test Group 3 would maintain the current access fee cap of $0.0030 required by Rule 610(c) of Regulation NMS. By construction, Test Group 3 is designed to observe the effect of the absence of rebates or Linked Pricing on conflicts of interest and the equilibrium fee level and how that fee level would affect order routing decisions, execution quality, and market quality. Further, exchanges would continue to be permitted to have varying fees within each test group, and would be permitted to change their fees at their discretion, subject to Commission review, during the proposed Pilot for securities within each test group, so long as they comply with the conditions of the applicable test group.

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221 See Section III.D infra.

222 See supra note 116. The Commission would detail the specifications of the stratification by notice.

In the absence of the proposed Pilot, the Commission preliminarily believes it is unlikely that exchanges would collectively undertake a similar pilot and voluntarily coordinate the exogenous shock to fees and rebates across a broad set of securities, broker-dealers, and exchanges that would be required to appropriately analyze the effects of changes to fees and rebates.[223] By imposing the same modifications to fees and rebates on all U.S. equities exchanges, the proposed Pilot would allow the Commission and the public to obtain data that would permit them to examine how changes to fees and rebates affect order routing decisions of broker-dealers. Accordingly, the Commission believes that the proposed Pilot would enable the collection of valuable data for both the Commission and the public that would otherwise be unavailable.

The Commission is mindful of the costs imposed by, and the benefits obtained from, our rules. Whenever the Commission engages in rulemaking and is required to consider or determine whether an action is necessary or appropriate in the public interest, Section 3(f) of the Exchange Act requires the Commission to consider whether the action would promote efficiency, competition, and capital formation, in addition to the protection of investors.[224] Further, when making rules under the Exchange Act, Section 23(a)(2) of the Exchange Act requires the Commission to consider the impact such rules would have on competition.[225] Section 23(a)(2) of the Exchange Act also prohibits the Commission from adopting any rule that would impose a burden on competition not necessary or appropriate in furtherance of the

223 See Section V.B.1.b.i infra.

224 See 15 U.S.C. 77b(b) and 15 U.S.C. 78c(f).

225 See 15 U.S.C. 78w(a)(2).

purposes of the Exchange Act.[226] The Commission preliminarily believes that many of the likely impacts of this proposal on efficiency, competition, and capital formation would be temporary in nature and would affect markets only for the duration of the proposed Pilot. The following analysis considers in detail the economic effects that may result from the Transaction Fee Pilot proposed in this release.

Where possible, the Commission has quantified the likely economic effects of the proposed Transaction Fee Pilot; however, as explained further below, the Commission is unable to quantify all of the economic effects because it lacks the information necessary to provide reasonable estimates. In some cases, quantification depends heavily on factors outside of the control of the Commission, which make it difficult to predict how market participants would act under the conditions of the proposed Pilot. For example, because of the flexibility that market participants have with respect to the choice of trading center for execution of transactions and because those choices can be influenced by factors outside of the scope of this pilot, such as volume discounts, the Commission cannot quantify, ahead of the proposed Pilot, the economic impact of any changes in order routing decisions by broker-dealers that may result from the proposed Pilot. Nevertheless, as described more fully below, the Commission provides both a qualitative assessment of the potential effects and a quantified estimate of the potential aggregate initial and aggregate ongoing costs, where feasible. The Commission encourages commenters to provide data and information to help quantify the costs, benefits, and the potential impacts of the proposed rule on efficiency, competition, and capital formation.

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[226] Id.

A. Background on Transaction-Based Fees and Potential Conflicts of Interest

This section provides a review of transaction-based fee models, including a discussion of the history and mechanics of transaction-based pricing. This section also presents an overview of the recent concerns about potential conflicts of interest between broker-dealers and their customers attributed to access fees and rebates assessed by exchanges.

1. Overview of Transaction-Based Fees

Maker-taker pricing models originated on electronic communications networks (ECNs) in the late 1990s as ECNs attempted to attract order flow and draw liquidity from traditional exchanges by offering rebates to market participants that posted liquidity to their platforms.[227] Shortly thereafter, exchanges followed suit and adopted maker-taker pricing models as market share migrated from traditional exchanges to ECNs. Today, nearly all U.S. equities exchanges have some form of transaction-based pricing models.[228]

Generally, transaction-based pricing models charge fees or remit rebates to members depending on whether their executed orders "make" or "take" liquidity from the market. An order that makes liquidity provides share volume (or depth) on a trading center at various execution prices, whereas an order that takes liquidity removes the volume (or depth) resting on the trading center provided by the make orders. Orders that make, or provide, liquidity are non-marketable limit orders, which are limit orders that are submitted to an exchange or other trading center that cannot be filled immediately when they arrive because no market participant is

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227 In 1997, Island ECN was the first electronic trading platform to offer rebates to attract limit orders to its platform.

228 As of March 2018, EDGA and IEX do not operate as a maker-taker or taker-maker market, although both charge flat fees. The remaining 11 exchanges are either maker-taker (nine) or taker-maker (two) exchanges. The baseline discusses these exchanges in more detail.

willing to trade at the price of the order (i.e., the limit price).[229] For example, if a customer places an order to sell 100 shares of a security at $9.00 per share when the prevailing market bid price is $8.75, that customer is placing a non-marketable limit sell order that indicates her willingness to provide 100 shares of liquidity to the market at a price of $9.00. In contrast, orders that take, or remove, liquidity, are marketable orders. A marketable order, in turn, can be either a market order, which is an order to buy or sell a security to be executed immediately at current market prices, [230] or a marketable limit order, which is either a limit buy order with a price at or above the lowest offer price in the market or a limit sell order with a price at or below the highest bid in the market. For example, if a customer places an order to sell 100 shares of a security at $8.50 per share when the prevailing market bid price is $8.75 at a depth of more than 100 shares, that customer is placing a marketable limit sell order, and would take 100 shares of liquidity at a price of $8.75.

In maker-taker models, an exchange charges an access fee to broker-dealers that take liquidity using marketable orders and remits a rebate to broker-dealers that make liquidity by placing standing non-marketable limit orders that subsequently interact with marketable orders. In a taker-maker market, the exchange charges an access fee to broker-dealers that provide liquidity by placing non-marketable limit orders and pays a rebate to market participants that take liquidity using marketable orders. In 2005, the Commission adopted Rule 610(c) of Regulation NMS,[231] which limited the maximum access fee that could be charged by maker-

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229 A limit order is an order to buy or sell a security at a specified price or better. As the price of the non-marketable order gets further from the bid or offer price, the greater the likelihood that the non-marketable order must rest until better priced orders execute.

230 As long as there are willing sellers and buyers, market orders are filled.

231 See NMS Adopting Release, supra note 1.

taker exchanges to $0.0030 per share. The adoption of the fee limit was designed to ensure the fairness and accuracy of the displayed quotations by establishing an upper bound on the cost of accessing such quotations,[232] while also precluding certain trading centers from raising their fees substantially to market participants required to access their quotations by the Order Protection Rule,[233] and preventing certain trading centers from taking advantage of intermarket price protection by acting as toll booths between price levels.[234]

2. Potential Conflicts of Interest

Academics, market participants, regulators, and legislators recently have expressed concern about how transaction-based fees have affected order routing decisions by broker-dealers and the execution quality obtained by customers.[235] This concern has centered on the potential for conflicts of interest between broker-dealers and their customers that may distort best execution practices.

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232 See id. at 37543-46.

233 See NMS Adopting Release, supra note 1, at 37504-38. The Order Protection Rule is designed to ensure that investors receive a consistent price quotation for NMS stocks across all exchanges where a security is traded and that investors receive the best possible execution price for marketable orders.

234 See id. at 37584. See also Harris, supra note 23 (suggesting that large access fees were a response to some trading venues paying large rebates to market participants as a means of attracting order flow to those venues in the early days of maker-taker exchanges).

235 See Staff Maker-Taker Memo, supra note 99. See also Angel, Harris, and Spatt, supra note 106; Jeffrey Bacidore, Hernan Otero, and Alak Vasa, "Does Smart Routing Matter?", Working Paper, Investment Technology Group, Inc. (2010), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1681449 ("Bacidore, Otero, and Vasa"); Battalio Equity Market Study, supra note 22; Harris, supra note 23. In addition to potential conflicts of interest, several of these studies have also indicated that transaction-based pricing models have led to reduced price transparency for investors and increased market fragmentation and complexity. These are discussed in greater detail in Section V.C.1.b, infra.

Broker-dealers are required to use reasonable diligence to execute customer orders according to best execution standards, which require broker-dealers "to execute customers' trades at the most favorable terms reasonably available under the circumstances….."[236] When seeking best execution for their orders, broker-dealers often consider opportunities to obtain prices better than those currently quoted. In order to comply with best execution standards, broker-dealers evaluate their aggregate customer orders and periodically assess which competing trading center offers the most favorable terms of execution.[237] The quoted prices that are used by broker-dealers to meet their best execution standards do not reflect any access fees assessed or rebates offered by the exchanges.[238]

Even while complying with best execution requirements, broker-dealers may route non-marketable limit orders to trading centers that offer the best quoted prices but that also offer high rebates for those orders, which the broker-dealers may then retain, rather than pass through to customers.[239] The availability of high rebates, however, may influence how broker-dealers route

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236 See NMS Adopting Release, supra note 1, at 37537-38. See also supra note 215.

237 See NMS Adopting Release, supra note 1, at 37537-38.

238 See, e.g., Angel, Harris, and Spatt, supra note 106.

239 The potential conflicts of interest are more likely when broker-dealers retain the rebates, because such broker-dealers have greater incentive to maximize those rebates potentially at the expense of customer execution quality. The Battalio Equity Market Study, for example, found that a sample of retail broker-dealers appear to route orders to venues that offer large rebates, thereby maximizing order flow payments. However, as noted in the Battalio Equity Market Study, routing orders to venues with large rebates did not result in superior execution quality for non-marketable limit orders. See Battalio Equity Market Study, supra note 22. See also David Cimon, "Broker Routing Decisions in Limit Order Markets," Working paper, Bank of Canada, (2017) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2789804. Cimon provides a theoretical model of conflicts of interest in broker-dealer markets, where broker-dealers route marketable orders to venues with low access fees to reduce the access fees paid by the broker-dealer, increasing the volume of uninformed orders and lowering the risk of adverse selection for non-marketable limit orders posted to that venue.

customer orders to the detriment of customers, even if orders are still routed to an exchange posting the best quoted prices.[240] One study, for example, shows lower execution quality, in terms of reduced probability of execution or increased time to execution, for non-marketable limit orders on exchanges that pay high rebates.[241] Thus, broker-dealers may route orders to exchanges that have the best quoted prices but are suboptimal for customers in other ways because orders are either less likely or take longer to execute.

Maker-taker exchanges with high rebates tend to have high access fees, which increase the cost to broker-dealers to execute marketable orders. These high access fees may lead broker-dealers to route marketable orders to exchanges with lower access fees, even though there may be a significant number of standing non-marketable limit orders on exchanges with higher access fees.[242] As the broker-dealers route marketable orders to exchanges with lower access fees, execution quality for the non-marketable limit orders is likely to deteriorate because the non-marketable limit orders are likely to have lower probability of execution and longer times to execution for orders that do execute. High rebates may also limit the ability of an exchange to

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240 The duty of best execution requires broker-dealers to execute customer trades at the most favorable terms reasonably available under the circumstances. See NMS Adopting Release, supra note 1, at 37537-38. The duty of best execution is not inconsistent with the automated routing of orders; however, broker-dealers must periodically assess the quality of competing markets to ensure that order flow is directed to markets providing the most beneficial terms for their customer orders.

241 See, Battalio Equity Market Study, supra note 22, which finds some evidence that execution quality is related to the transaction-based fees. For instance, in their analysis of a single order-routing system, for a sample of matched limit orders placed on high fee and low fee venues, high fee venues have a fill rate of approximately 73%, while low fee venues have a fill rate of approximately 99% (Table V). Further, in a multiple regression analysis (Table VI), the study shows that the probability of filling an order is decreasing as the take fee increases, while the time to execution increases. The limitations of the Battalio Equity Market Study are discussed below in Section V.B.1.b, infra.

242 See, Angel, Harris, and Spatt, supra note 106.

generate a liquidity externality because these high rebates could draw order flow to exchanges with low execution quality, despite the availability of higher execution quality on other trading centers.[243] This behavior may fragment order flow. In contrast, if exchanges did not provide high rebates, broker-dealers may be more likely to route orders to exchanges that quote the best price and have the best overall execution quality,[244] permitting order flow to consolidate on those venues.

In general, customer orders routed to exchanges that remit high rebates are also more likely to face adverse selection when executed.[245] Adverse selection occurs when one party to a transaction has less information about the value of an asset than the other party to the transaction, resulting in the possibility that the less informed party only transacts when it is disadvantageous to do so. In the context of order execution, adverse selection is likely to occur because some fraction of market participants is likely to possess more precise information about the value of a security.[246] Order flow from these "informed traders" is generally routed to exchanges. In order

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243 A liquidity externality occurs when a given trading center becomes the preferred trading destination for both marketable and non-marketable orders.

244 See Battalio Equity Market Study, supra note 22, at 2232 ("[O]ur results suggest that . . . routing decisions based primarily on rebates/fees are inconsistent with best execution. For limit order traders, there are significant opportunity costs [with respect to execution quality] with routing all nonmarketable limit orders to a single venue offering the highest liquidity rebates.").

245 See, Angel, Harris, and Spatt, supra note 106. See also Peter Hoffman, "Adverse Selection, Market Access and Inter-market Competition," Journal of Banking & Finance 65, 108-119 (2016), available at https://www.sciencedirect.com/science/article/pii/S0378426615002976; Sviatoslav Rosov, "HFT, Price Improvement, Adverse Selection: An Expensive Way to Get Tighter Spreads?", CFA Institute (2014) available at https://blogs.cfainstitute.org/marketintegrity/2014/12/18/hft-price-improvement-adverse-selection-an-expensive-way-to-get-tighter-spreads/ ("Rosov").

246 Some market participants may know more about the value of a security because some investors, such as some professional traders, could just be better at processing public

for the exchanges to draw sufficient liquidity to satisfy the orders placed by informed traders, they may offer high rebates to broker-dealers to attract non-marketable limit orders, which are likely to be placed by uninformed traders, to satisfy the demands of informed traders' order flow.[247] Under such circumstances, these non-marketable limit orders face an adverse selection problem because they execute against marketable orders that likely were placed by informed traders.[248] As adverse selection increases at high rebate/high fee exchanges, informed traders will always execute orders to the detriment of uninformed traders (retail customers), i.e., the orders will more likely be executed at disadvantageous prices for the uniformed traders relative to customer orders routed to low rebate/low fee exchanges, where the likelihood of facing an informed trader is less.[249] In these situations, the broker-dealers thus face a potential conflict of

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information. See, e.g., Michael Brennan and Avanidhar Subrahmanyam, "Market Microstructure and Asset Pricing: On the Compensation for Illiquidity in Stock Returns," Journal of Financial Economics 41, 441-464 (1996), available at http://www.sciencedirect.com/science/article/pii/0304405X9500870K; David Easley and Maureen O'Hara, "Information and the Cost of Capital," Journal of Finance 59, 1553-1583 (2004), available at http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.2004.00672.x/pdf.

247 Exchanges do not have sufficient liquidity from retail marketable orders because they are generally internalized or routed to wholesalers to avoid access fees. Several studies indicate that internalizers are unlikely to accept marketable orders from market participants that are likely to be informed. See Angel, Harris, and Spatt, supra note 216; Rosov, supra note 245.

248 See, e.g., Dolgopolov, supra note 21. For example, if an investor had a non-marketable limit buy order at $10, when the current market price was $10.25, that standing limit order to buy at $10 is likely to only get executed when prices are declining.

249 See Katya Malinova and Andreas Park, "Subsidizing Liquidity: the Impact of Make/Take Fees on Market Quality," Journal of Finance 70, 509-536 (2015), available at http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.2004.00672.x/pdf (examining the introduction of maker rebates on the Toronto Stock Exchange); Yiping Lin, Peter Swan, and Frederick H. deB. Harris, "Maker-Taker Fees, Liquidity Competition, and High Frequency Trading," Working Paper, University of New South Wales (2017) (examining the Nasdaq pilot, described above in Section II.B). In analyses of markets where

interest when they receive high rebates from the exchanges seeking to attract liquidity while their customers bear costs of the disadvantageous prices resulting from the adverse selection.

Given the competitive nature of the broker-dealer industry,[250] the Commission considered whether competition could alleviate potential conflicts of interest between investors and broker-dealers, as investors choose between broker-dealers that offer to place orders on their behalf. To the extent that investors are able to identify broker-dealers that do not act on potential conflicts of interest, investors could discourage broker-dealers from acting on such conflicts of interest. The Commission preliminarily believes, however, that competition between broker-dealers may not resolve this issue because of a combination of three reasons: asymmetric information, switching costs and a lack of collective action.

First, asymmetric information between broker-dealers and their customers limits the ability of customers to identify broker-dealers that do not act on potential conflicts of interest. For example, customers do not generally have access to information about broker-dealers' individual sources of revenue.[251] As discussed below in more detail, although disclosures

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exchanges conducted pilots altering the access fees and rebates paid on subsets of stocks, results indicate that markets with lower access fees (and rebates) had reduced adverse selection costs. Venues with lower access fees could draw increased order flow from both informed and uninformed traders. If the proportion of informed traders is unlikely to change due to fees and rebates changes, as overall order flow increases due to lower access fees, then the likelihood of transacting with an informed trader declines, thereby reducing the adverse selection costs to traders.

250 <u>See</u> Section V.B.2.a <u>infra</u>.

251 While consolidated revenues may be available from Form 10-K filings for broker-dealers that are public reporting companies, broker-dealers do not report revenues attributable to specific sources, such as rebates from a particular exchange or payments for order flow from a particular venue. For instance, revenues derived from commissions and fees are often just reported in aggregate as "Commissions and Fees." Therefore, even though aggregate revenues for some broker-dealers are publicly available, customers do not have

required pursuant to Rule 606 provide information about material conflicts of interest related to payment for order flow, these disclosures do not provide information on the effect of transaction-based fees on order routing decisions. Moreover, while under Rule 606, a customer may request information about the venues to which her orders were routed in the prior six months, a customer cannot necessarily use this information to compare how these orders would have been treated by other broker-dealers. Further, these disclosures do not provide customers with information about the payment and collection of transaction-based fees and rebates by broker-dealers.

Second, even if investors had sufficient information to conclude they would be better served by a different broker-dealer, investors may face costs in switching broker-dealers.[252] If these switching costs are high relative to the costs that investors anticipate may arise from potential conflicts of interest, investors may not switch broker-dealers even if it appears that their broker-dealer may have acted on conflicts of interest.

The presence of switching costs also may exacerbate a collective action problem among investors.[253] While investors could provide incentives to broker-dealers to eliminate potential conflicts of interest by threatening to move accounts away from broker-dealers known to act on conflicts of interest, switching costs may undermine the credibility of such a threat. This is because, although each customer individually bears a cost to switch accounts, the benefits of a successful threat, while conditional on a sufficient number of customers agreeing to switch, are

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access to the information on individual sources of revenue that could reveal potential conflicts of interest.

252 These switching costs may be monetary, but may also have a time and effort component.

253 Collective action occurs when a number of individuals or entities work together to achieve a common objective, such as investors acting to reduce the potential conflicts of interest in order routing decisions by broker-dealers.

available to all customers whether they would switch or not. If the switching costs are high relative to the proportion of customer defections necessary to threaten a broker-dealer, customers are unlikely to generate enough of a threat to alter broker-dealers' behavior.

B. Baseline

We compare the economic effects of the proposed rule, including benefits, costs, and effects on efficiency, competition, and capital formation, to a baseline that consists of the existing regulatory framework and market structure. As explained above, by temporarily altering the fee and rebate structure for certain NMS stocks (including ETPs), the proposed Pilot is designed to produce information on order routing behavior that would not otherwise be available. The baseline discusses the existing set of information, as well as the exchanges' current practices with respect to fees and rebates and the regulations governing those fees and rebates.

1. Current Information Baseline

While the studies cited above discuss the potential issues for investors associated with transaction-based fee models,[254] limited empirical evidence exists to date about the extent that potential conflicts of interest arise from maker-taker and taker-maker pricing models and how transaction-based fees affect the integrity and structure of the U.S. equity markets. Below, we discuss the existing information currently available to the Commission or the public that concerns the relationship between transaction-based fees and order routing decisions and describe the limitations of this information for use in policy discussions regarding transaction-based fees and potential conflicts of interest.

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[254] See supra note 216.

a. Existing Information

The existing empirical studies available regarding the relation between transaction-based fees, order routing decisions, and execution quality consists of two studies: one academic study and a study conducted by Nasdaq.[255] According to the Battalio Equity Market Study, broker-dealers appear to trade execution quality of customer orders, as measured by the likelihood of and time to execution (and not price), for the rebates obtained by providing liquidity to maker-taker venues.[256] By routing orders to exchanges that pay high rebates, broker-dealers may engage in rebate capture at the expense of client execution.[257] Using data obtained from mandatory Rule 606 disclosures over a two-month window, [258] the Battalio Equity Market Study

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[255] Although a number of studies theoretically suggest that the transaction-based pricing structure coupled with discretion by broker-dealers over order routing decisions could lead to potential conflicts of interest with their customers, only the Battalio Equity Market Study provides empirical evidence on the effect of fees and rebates on order routing. Battalio Equity Market Study, supra note 22. As discussed more thoroughly below in Section V.B.1.b, the Battalio Equity Market Study, while enlightening, has a number of limitations that inhibit the ability to draw causal inferences from it about potential conflicts of interest. See, e.g., Angel, Harris, and Spatt, supra notes 106 and 216; Dolgopolov, supra note 21; Harris, supra note 23.

[256] The Battalio Equity Market Study's abstract of the paper states: "We identify retail brokers that seemingly route orders to maximize order flow payments by selling market orders and sending limit order to venues paying large liquidity rebates . . . . [W]e document a negative relation between limit order execution quality and rebate/fee level. This finding suggests that order routing designed to maximize liquidity rebates does not maximize limit order execution quality . . . ." See Battalio Equity Market Study, supra note 22, at 2193.

[257] See Battalio Equity Market Study, supra note 22. See also Section V.A.2 supra, for an overview of the potential conflicts of interest that emerge.

[258] Rule 606 requires broker-dealers to provide quarterly reports that provide an overview of their routing practices. See Securities Exchange Act Release No. 51808 (November 27, 2000), 65 FR 75414, (December 1, 2000) ("Disclosure or Order Execution and Routing Practices"). Rule 606 disclosures require broker-dealers to disclose material aspects of their relationships with certain trading venues, including a description of payment for order flow. The reports, however, do not require broker-dealers to disclose the amounts of payment for order flow, or the rebates received or access fees paid.

also identified that four of the ten broker-dealers included in the analysis route limit orders exclusively to market makers or to exchanges that offered the largest liquidity rebates (and charging the highest access fees).[259] A number of tests in the Battalio Equity Market Study also show that low-fee venues provide better execution quality for limit orders, as measured by the likelihood of an order fill, the speed of execution, and higher average realized spreads, relative to high-fee venues, suggesting that order routing decisions to high rebate venues are likely to be suboptimal from a customer's perspective, and may be indicative of potential conflicts of interest.

Separately, and as discussed in Section II.B,[260] Nasdaq independently conducted a study, whereby it lowered access fees and rebates for a sample of 14 stocks over a period of four months in 2015, providing an exogenous shock to the transaction-based pricing model on the exchange. The Nasdaq experiment lowered both the access fees charged and the liquidity rebates paid on the securities included in their study.[261] Nasdaq's analysis indicated that Nasdaq's reduction in access fees and liquidity rebates reduced Nasdaq's market share and Nasdaq's incidence of providing the NBBO, suggesting that Nasdaq experienced a decline in some measures of market quality as a result of the changes to access fees and rebates.[262] Further,

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259 See Battalio Equity Market Study, supra note 22. The Battalio Equity Market Study, however, does not specify whether the limit orders are marketable or non-marketable limit orders, as Rule 606 disclosures do not segment these orders.

260 See supra notes 31 and 32 and corresponding text.

261 The Nasdaq study lowered access fees to \$0.0005 and rebates to \$0.0004 simultaneously for a set of 14 securities, half of which identified Nasdaq as the primary listing exchange, the other half which identified the NYSE as the primary listing exchange. The Nasdaq released two reports (see supra note 31) examining the changes to a number of metrics related to market quality.

262 Although the 14 stocks experienced a decline in market share on Nasdaq and their incidence of time at the NBBO, there was no statistically significant change in the level

Nasdaq found that there was a shift in the composition of the top five liquidity providers for the securities that occurred as a result of the experiment.[263]

Two studies have examined exogenous shifts between maker-taker and payment for order flow pricing models on U.S. options exchanges.[264] These studies found that the movement from a payment for order flow model to a maker-taker model led to a decrease in execution costs for option classes affected by the shift, improved quoted spreads, and altered broker-dealer order routing behavior to account for the fees.[265] However, the change to a payment for order flow model from a maker-taker model yielded better execution quality, but a reduction in the number of orders and order volume.[266]

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of liquidity taking, variance ratio, realized spread, return autocorrelation, effective spread, relative effective spread, quoted spread, relative quoted spread, displayed dollar depth at the NBBO, or time between either quote updates or price changes in the NBBO. See Nasdaq May Report, supra note 31.

263 The top five liquidity providers prior to the start of the pilot significantly reduced their liquidity provision from 44.5% of the liquidity provided pre-pilot to 28.7% in the pilot period. However, the top five liquidity providers from the pilot period had a significant increase in their liquidity provision from 29.7% pre-pilot to 41.5% in the pilot period. See Nasdaq May Report, supra note 31.

264 See Amber Anand, Jian Hua, and Tim McCormick, "Make-Take Structure and Market Quality: Evidence from the U.S. Options Markets," Management Science 62, 3217-3290 (2016), available at: https://pubsonline.informs.org/doi/abs/10.1287/mnsc.2015.2274 ("Anand, Hua, and McCormick"); Robert Battalio, Todd Griffith, and Robert Van Ness, "Make-Take Fees versus Order Flow Inducements: Evidence from the NASDAQ OMX PHLX Exchange," Working Paper, University of Notre Dame (2017), available at: http://www1.villanova.edu/content/dam/villanova/VSB/assets/marc/marc2017/SSRN-id2870000.pdf ("Battalio, Griffith, and Van Ness"). Anand, Hua, and McCormick explores the transition from a payment for order flow model to a maker-taker model on NYSE ARCA, while Battalio, Griffith, and Van Ness examines the shift on NASDAQ OMX PHLX ("PHLX") from a maker-taker model to a payment for order flow model.

265 See Anand, Hua, and McCormick, supra note 264.

266 See Battalio, Griffith, and Van Ness, supra note 264.

A number of existing data sources could be used independently or in combination to relate transaction-based fees to order routing and execution quality. For instance, in the Battalio Equity Market Study and the Nasdaq Study discussed above, researchers employed some combination of Rule 606 data, proprietary broker-dealer data, the Trade and Quote (TAQ) database,[267] and proprietary exchange data. In addition, while not employed in previous studies, CAT data, Rule 605 data, and exchanges' Form 19b-4 fee filings and fee schedules available from each exchange's website, could provide insights into the relation between transaction-based fees, order routing, and execution quality.

Rule 606 requires broker-dealers to make publicly available quarterly reports that provide an overview of their routing practices for non-directed retail orders in NMS securities. As a further requirement of Rule 606, broker-dealers must disclose the identities of the ten venues to which the largest number of orders were routed for execution. Rule 606 disclosures additionally require broker-dealers to disclose material aspects of their relationships with trading venues to which they route orders, including a description of payment for order flow and any profit sharing relationships, which, like rebates, could lead to potential conflicts of interest for broker-dealers when routing orders.[268] Researchers and other analysts interested in order routing data can download these forms quarterly directly from broker-dealer websites.

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267 The Battalio Equity Market Study, supra note 22, relies on Rule 606 disclosures to identify order routing for a small sample of broker-dealers, proprietary broker-dealer data from a single smart-order routing system to capture limit order execution quality for this broker-dealer's orders, and the TAQ data to measure execution quality as a function of each venue's taker fee or rebate.

268 Conflicts of interest for broker-dealers potentially could arise from a number of sources, including affiliations with trading venues, receipt of payment for order flow, receipt of payment from profit-sharing relationships, and rebates. Rule 606, however, requires only descriptions of any arrangements for payment for order flow, but does not require broker-dealers to provide information on the net amount of payment for order flow, payment

Proprietary data from broker-dealers or exchanges could also provide information about order routing and execution quality. Broker-dealer data include information on the orders received and routed by that broker-dealer, including where the broker-dealer routed orders, whether the orders execute, and the price, size, and time of execution. Exchange data include information on the order received by an exchange, including which members routed orders to the exchange, whether the orders execute, and the price, size, and time of execution. As these data include commercially sensitive information, they are not broadly available.

Once the CAT Phase 1 becomes operational,[269] the Commission and SROs will have information on all exchange routing and exchange executions for all NMS securities. In CAT Phase 1, exchanges would record and report order events on every order they receive for NMS securities. Order events include order receipt, order routes, order modifications, order cancelations, and order executions.

Rule 605 data provides information about execution quality by market center, including exchanges, ATSs, and broker-dealers that execute orders, by requiring standardized reports of statistical information regarding order execution, and was designed to improve the public disclosure of order execution practices by exchanges.[270] These data are available monthly from market center websites or data vendors, and provide information on execution quality statistics such as transaction costs, execution speed, and fill rates reported separately for marketable and non-marketable orders.

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received from profit-sharing relationships, or disclosure of access fees paid or rebates received. See Disclosure of Order Execution and Routing Practice, supra note 258, at 75425-28.

269 See supra note 172.

270 See Disclosure of Order Execution and Routing Practice, supra note 258, at 75417-25.

Beyond Rule 605 data, researchers could also use the TAQ database as a means of measuring order execution quality. The TAQ database is publicly available (for a fee) from the NYSE and provides access to all trades and quotes for NMS securities, from which researchers and other analysts can estimate trade-based measures of execution quality.

Finally, researchers and other analysts can manually create datasets of exchange fees and rebates from the information that exchanges provide on their websites and release in their Notice of Filing of Proposed Rule Changes, which would capture information contained in exchanges' Form 19b-4 fee filings. The Form 19b-4 fee filings record changes to the existing exchange fee schedules with the Commission. At any point that an exchange chooses to make a change to any aspect of its access fees and rebates, the exchange must provide notice to the Commission that it is filing a proposed rule change to amend its existing fee and rebate schedule. Exchanges may file their revisions to fees and rebates for immediate effectiveness upon submitting the Form 19b-4 fee filings with the Commission.

b. Limitations of Existing Information

Existing studies and available data sources are limited in ways that are likely to reduce the strength of conclusions that relate to the impact of transaction-based fees and rebates on order routing decisions and the existence or magnitude of potential conflicts of interest between broker-dealers and their customers. The limitations of existing studies fall primarily into two categories: (1) the results of the studies may not be representative, and (2) the results of the studies cannot make a causal connection needed to inform on potential conflicts of interest. This section discusses those limitations as well as separately discussing the limitations associated with existing sources of data mentioned above.

i. Representative Results

The results of both the Battalio Equity Market Study and the Nasdaq study may not be representative of the potential impacts of broad changes in access fees or rebates. Drawing market-wide inferences from the limited samples in these studies could be problematic because the results are predicated on information obtained from a single broker-dealer or trading venue. First, the Battalio Equity Market Study uses order level data from a single broker-dealer to determine the relation between maker-taker fees and limit order execution quality. Analysis based on observation of a single broker-dealer may not provide representative results because the relation between transaction-based fees and potential conflicts of interest may not be generalizable to other broker-dealers. For example, over 400 broker-dealers maintain membership with at least one U.S. equities exchange.[271] If the single broker-dealer examined in the Battalio Equity Market Study has significantly different order routing behavior than the average broker-dealer that routes orders to exchanges, the information obtained from examining the relation between transaction-based fees and order routing decisions of that broker-dealer would not be representative of the entire market and therefore would provide an incomplete representation of potential conflicts of interest.

The Battalio Equity Market Study also relies on a sample of Rule 606 order routing decisions obtained directly from the reporting entities' websites from a limited sample of ten well-known national retail brokers from a single quarterly reporting cycle (October and November 2012). As discussed above, over 400 broker-dealers are members of at least one national securities exchange. The ten retail brokers analyzed in the Battalio Equity Market Study

[271] Estimates based on data from Form 1 of the X-17A-5 filings. As of December 31, 2016, 3,972 broker-dealers that filed form X-17A-5. See Section V.B.2.a infra.

make up approximately 2.1% of the broker-dealers with exchange memberships, and less than 0.3% of broker-dealers overall. Although these are well-known retail brokers, due to the lack of representativeness of the sample (e.g., the majority of the broker-dealers represented in the Battalio Equity Market Study are online broker-dealers), these broker-dealers may be more (or less) likely than the average broker-dealer to route customer orders in ways that benefit themselves at the expense of their customers. The findings in the Battalio Equity Market Study, therefore, may not be representative of a broader sample of broker-dealers. Moreover, the Commission is unable to determine if the Battalio Equity Market Study's analyses of the Rule 606 disclosure data has statistical power because the authors did not provide any statistical analyses beyond the percentage of market or limit orders routed to a particular exchange.

Similarly, the results of the Nasdaq study may not be representative of the broader market, as the Nasdaq study affected only a very small sample of common stocks and focused on order routing to a single exchange. As discussed in Section II.B, Nasdaq selected 14 stocks to be part of the analysis, which represent only 0.3% of all NMS stocks. The sample is unlikely to be representative of the universe of NMS securities for two reasons: (1) the sample included a small number of stocks (and no ETPs),[272] and (2) less than one-third of these stocks were small or mid-capitalization at the time of the analysis, although most had market capitalizations close to $3 billion immediately prior to the study.[273] Further, the analysis only focused on the effects of changes to transaction-based fees for a single exchange: Nasdaq. As the other equities exchanges did not have similar changes to transaction-based fees and rebates, any inferences

[272] Only common stocks were included in the Nasdaq study, while the proposed Pilot will include NMS stocks, which includes common stocks as well as ETPs.

[273] Market capitalizations are computed from CRSP shares outstanding and stock price, as of December 31, 2014.

drawn from the Nasdaq study may not be valid under different circumstances in which all equities exchanges were subject to consistent revisions to transaction-based fees.

In the spirit of the Nasdaq study, exchanges could coordinate voluntarily to simultaneously implement a pilot similar to the Nasdaq pilot on all exchanges over a broader sample of stocks, to produce more representative results. The Commission preliminarily believes, however, that exchanges would not be likely to coordinate changes to access fees and rebates for the purpose of studying potential conflicts of interest between broker-dealers and their customers because of competitive incentives, such as inducements to draw order flow away from competitors.[274]

Researchers could conduct studies with data sources currently available that provide more representative results than those provided in existing studies. However, the Commission preliminarily believes that data limitations discussed in greater detail below could make such studies difficult. Moreover, the results of such studies would unlikely be able to establish a causal connection between transaction-based fees and order routing decisions by broker-dealers needed to inform policy decisions on potential conflicts of interest. The importance of causal inference is discussed in the next section.

ii. Causality

In addition to limitations in how representative results may be, existing studies are also of limited use for policy decisions because they cannot test for causal relationships between transaction fees and order routing decisions. Because transaction-based fees and order routing decisions could be jointly determined, researchers cannot readily disentangle the direction of

[274] With respect to the Nasdaq study, the purpose of revising access fees and rebates was to determine how these changes affected market share and Nasdaq's fraction of time at the NBBO.

causality, and therefore cannot determine the extent that potential conflicts exist. The identification of causal relations between fees and order routing decisions becomes increasingly complex because exchanges have some discretion to modify their fees.[275] In practice, researchers attempt to identify and measure causal relations in two ways: (1) exogenous shocks, which have been discussed above, and (2) econometric techniques, such as an instrumental variables approach.[276]

Although the Nasdaq study implements an exogenous shock, which could have permitted causal inference regarding the relationships between transaction fees, order routing, and market quality, that study did not analyze the impact of potential conflicts of interest on order routing decisions. Further, even if the Nasdaq study had analyzed a causal relationship between transaction-based fee and rebates and potential conflicts of interest, the limited representativeness of the Nasdaq sample, would limit the generality of the study.

With respect to the transition between forms of pricing models that occurred on the option exchanges, discussed above, the key limitation is the comparison of maker-taker pricing models with payment for order flow pricing models. Studies that explore these regime shifts between maker-taker to payment for order flow models are not comparing situations in which one regime could theoretically have lower conflicts of interest than the other.[277] Each of these

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275 Over the last five years, the exchanges, on average, have made 34 revisions, or approximately 6.7 revisions per year, to their transaction-based fees and rebates. See Section V.B.2.b infra.

276 The method of instrumental variables is used to estimate causal relationships when controlled experiments or exogenous shocks are not feasible. An “instrument” changes the explanatory variable but has no independent effect on the dependent variable, allowing a researcher to uncover the causal effect of the explanatory variables on the dependent variable of interest.

277 See supra note 264.

types of models is likely to create potential conflicts of interest that could affect how broker-dealers route their customer orders,[278] although evidence does not suggest that one form of pricing model is more or less prone to conflicts than another. Moreover, the change from one form of pricing model to another could introduce new conflicts of interest that did not previously exist. Therefore, the Commission preliminarily believes that exchange-driven transitions between maker-taker and payment for order flow pricing models are not likely to provide information about potential conflicts of interest driven by the maker-taker and taker-maker models or to inform the Commission about future regulatory decisions regarding transaction-based fees.

The Battalio Equity Market Study attempts to test for causal relationships between liquidity rebates and order routing decisions of broker-dealers using an instrumental variables approach. However, in the absence of an exogenous shock to access fee caps or rebates outside the control of exchanges, the authors are unable to definitively determine the causes of broker-dealers' order routing decisions through the use of econometric techniques. Consequently, the authors are unable to disentangle whether fees and rebates drive broker-dealer order routing decisions or order routing decisions determine fees and rebates chosen by exchanges.

Although exchanges revise their fee schedules frequently, the Commission preliminarily does not believe that studying order routing and execution quality around these fee changes alone can establish causality because fee changes are at the discretion of exchanges and could be

278 See Robert Battalio, Andriy Shkilko, and Robert Van Ness, "To Pay or Be Paid? The Impact of Taker Fees and Order Flow Inducements on Trading Costs in U.S. Options Markets," Journal of Financial and Quantitative Analysis 51, 1637-1662 (2016), available at: https://www.cambridge.org/core/services/aop-cambridge-core/content/view/0782CE3E9679C29BB910A66192D27201/S0022109016000582a.pdf/div-class-title-to-pay-or-be-paid-the-impact-of-taker-fees-and-order-flow-inducements-on-trading-costs-in-u-s-options-markets-div.pdf.

caused by changes to order routing behavior. In the absence of an event outside of the control of the exchanges (e.g., an exogenous shock to either fees or rebates), identifying the direction of causality between changes in fees and order routing behavior is nearly impossible. Thus, any discretionary actions by exchanges to revise their fee schedules independently of other exchanges is unlikely to yield information that would be valuable to the Commission for informing any future policy decisions about potential conflicts of interest between broker-dealers and their customers.

iii. Existing Data Sources

As noted above, several data sources provide information on order routing and execution quality. While researchers theoretically could use these data sources to produce representative results regarding the relation between transaction-based fees, order routing, and execution quality, the Commission preliminarily believes that data limitations, would make these studies difficult to produce.

As discussed previously, Rule 606 disclosures provide information on order routing. Rule 606 disclosures are currently the only data publicly available to researchers and others on order routing by broker-dealers; however, limitations in the Rule 606 data reduce the ability of researchers to use the data to produce representative results. The data are cumbersome to collect on a broad scale, as researchers would generally need to access each broker-dealer's webpage to manually download the data. The Rule 606 data are also only available at a quarterly frequency, and broker dealers are not required to maintain historical data, which hampers the ability to efficiently produce research on multiple quarters of data, and could lead to short sample periods that may provide relatively limited power for statistical tests.[279] Notably, there currently is no central repository of these data, so any collection of this information by researchers would be a lengthy and labor-intensive process. For example, a researcher that has not already downloaded a time series of Rule 606 reports would need to download one quarter at a time, waiting three months for each quarter's data to create a time series; assembling a single year's worth of data would require nine to twelve months. Such delays could significantly increase the opportunity costs of undertaking such studies and decrease the likelihood of new research on the relation between transaction-based fees and order routing decisions. Moreover, these limitations also could prevent other researchers and other analysts from verifying or replicating analyses if researchers did not concurrently collect the Rule 606 reports across the same periods of observation.

In addition, the quarterly frequency of the Rule 606 reports by broker-dealers is different from the frequency of changes in fee schedules by exchanges (e.g., as presented in Table 2, over a recent five-year measurement period, the average exchange updated its fees schedule approximately 6.7 times per year).[280] Further, while the Rule 606 data provides order routing at the broker-dealer level, such information is not granular enough to thoroughly study potential conflicts of interest.

The value of Rule 606 disclosures for identifying possible conflicts of interest resulting from transaction-based fees would be limited for a number of additional reasons, even if the Commission were to require a historical time series of these disclosures for all broker-dealers.

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279 See supra note 118.

280 Not every fee schedule revision pertains to access fees or rebates. To focus only on these revisions, each Form 19b-4 fee filing was evaluated to determine that revisions to fees or rebates were pertinent to this baseline.

First, each broker-dealer discloses data for only its top ten order routing venues. Second, because broker-dealers disclose data at a quarterly frequency, a five-year sample of Rule 606 data for a single broker-dealer, would include only 20 observations, limiting statistical power. Third, although Rule 606 reports also provide some disclosure about potential broker-dealer conflicts of interest, they do not include any disclosure of access fees assessed or rebates offered by exchanges to the broker-dealers. Fourth, Rule 606 data do not distinguish between marketable and non-marketable limit orders. Finally, Rule 606 currently covers only retail orders. If institutional orders also are subject to potential conflicts of interest, studying Rule 606 data alone would not inform on such conflicts of interest.

To produce representative results using proprietary broker-dealer or exchange data would require obtaining these data from a sufficient number of diverse broker-dealers and exchanges. However, proprietary data from broker-dealers or exchanges are generally not available to the public. While some researchers have obtained such data from a single broker-dealer or exchange, and some broker-dealers and exchanges employ their own researchers, the Commission preliminarily believes that it would be difficult for researchers to obtain such data from a sufficient number of broker-dealers or exchanges in order to produce representative results.

Regardless of whether researchers would obtain data from Rule 606 disclosures or directly from exchanges, much of the data currently available is either unstructured or in a non-standardized format. For instance, many broker-dealers provide PDF files of Rule 606 disclosures, while exchanges use bespoke terminology to classify their fees and rebates, which likely limits the value of these data for researchers examining the effect of fees and rebates on order routing decisions. This lack of standardization across platforms could make it difficult for researchers to aggregate data and construct representative samples for comparison and analyses.

While Rule 605 and TAQ data are available to researchers and may provide information about execution quality, they too have a number of limitations. For example, Rule 605 data provides execution quality information for both marketable and non-marketable orders; however, the methodologies for estimating measures of the speed of execution of non-marketable orders are outdated.[281] For instance, Rule 605 measures realized spreads based on quotations five minutes after the time of order execution and recent research suggests using quotations that more closely follow a trade, because any temporary price impact of a trade goes away within seconds, not minutes, of the trade.[282] Like Rule 606 data, Rule 605 data also covers smaller retail-sized orders only, and the data are only available at the monthly frequency. Instead, researchers and the Commission could rely on TAQ data, a publicly available dataset provided by the NYSE to subscribers, in order to capture some measures of execution quality. However, the TAQ data has limited information on limit order execution quality that would be valuable to the Commission and others.

To incorporate transaction-based fee information into analyses, researchers would need to manually collect and compile the information from exchanges' websites and their Form 19b-4 fee filings, which notify the Commission of changes to those fee schedules. Although the current fee schedules are posted on exchange websites, in order to identify changes to those fees, researchers would need to search the Commission's website for such Form 19b-4 fee filings to

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281 See Concept Release, supra note 3.

282 See, e.g., Jennifer Conrad and Sunil Wahal, "The Term Structure of Liquidity Provision," Working Paper, University of North Carolina – Chapel Hill (2017), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2837111.

identify when exchanges change their fees and to gather information about those fees, as exchanges do not file their fees on a routine basis, but rather only when making changes. Such information would be cumbersome to compile. Additionally, because of the complexity of exchange fee structures and the lack of standardization of these structures across exchanges, identifying comparable fees across exchanges is unwieldy. For example, identifying the base or top-tier fees across exchanges could be difficult for researchers. As shown in Table 2 below, the average exchange has 24 different access fee categories and 21 different rebate categories. Further, exchanges do not disclose per share average or median fees charged and rebates earned on any report or filing, so such information is unavailable to the public. To add to the impediments to fee data aggregation and comparison, Form 19b-4 fee filings are available only as PDF files downloadable from the Commission's website, thereby increasing the costs of aggregation across exchanges over time by researchers.

Even if limitations to data availability and aggregation were overcome and researchers could construct a representative sample of fee and routing data, researchers would still face obstacles in understanding the relationship between transaction-based fees and rebates and routing decisions. Without an exogenous shock to fees and rebates to infer the causal relation between these transaction-based fees and order routing decisions, researchers would not be able to analyze whether the order routing decisions observed are driven by fees and rebates or vice versa.[283]

2. Current Market Environment

This section provides an overview of the market for trading services, and of the exchanges and ATSs that could be affected as a result of revisions to the transaction-based fee

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283 See Section V.B.1.b.ii supra.

structure required by the proposed Pilot. Where information is currently available to the Commission, a description of the current practices of exchanges along dimensions that are relevant to the proposed Pilot (e.g., summary information on their current fee schedule or the frequency of fee revisions) are included.

a. Market for Trading Services

The market for trading services, which is served by exchanges, ATSs, and other liquidity providers (internalizers and others),[284] relies on competition to supply investors with execution services at efficient prices. These trading venues, which compete to match traders with counterparties, provide a platform for price negotiation and dissemination of trading information. The market for trading services in NMS securities consists of 13 national equity market exchanges and 34 ATSs. Other off-exchange venues include internalizers and wholesalers, which execute a substantial volume of retail order flow. The remainder of this section discusses the current competitive landscape for exchanges and ATSs relevant to our economic analysis of the proposed Pilot.

Since the adoption of Regulation NMS in 2005, the market for trading services has become more fragmented and competitive. As of July 18, 2017, 13 national equity market exchanges operate in the U.S., as shown in Table 1. Of these exchanges, nine are maker-taker exchanges and two are taker-maker pricing exchanges; the EDGA and IEX operate as flat-fee exchanges.[285] Since Regulation NMS was adopted in 2005, the market for trading services has

284 See supra note 247.

285 IEX charges a flat fee of $0.0009 for trades against non-displayed liquidity on both sides of the market, and charges $0.0003 for trade execution against displayed liquidity. See https://iextrading.com/trading/fees. As of March 2018, EDGA is no longer operating as a taker-maker market, but is also operating as a flat-fee venue. See http://markets.cboe.com/us/equities/.

become significantly more competitive as measured by the decline in market share of individual exchanges, discussed in more detail below. The number of U.S. equities exchanges has increased by over 60%, as the number of exchanges increased from eight exchanges in 2005 to 13 exchanges operating today, as shown in Table 1.[286] Several studies have suggested that transaction-based fee pricing partially drove the increase in the number of U.S. equities exchanges since 2005.[287]

Execution services are a lucrative business, which encourages new trading centers to enter the market in the hopes of capturing rents associated with order execution.[288] As discussed above, liquidity externalities, where the more liquid venues attract more interest and therefore more liquidity, could result in a single venue (or very limited number of venues) being the preferred trading location for any given stock because all traders could optimally route orders to

286 Although 13 U.S. equities exchanges currently operate as of March 2018, the majority of these exchanges are part of exchange families. For instance, NYSE, NYSE Arca, NYSE American, and NYSE National, are all part of the NYSE Group, which is wholly owned by the Intercontinental Exchange (ICE), while Nasdaq, Phlx, and BX, are owned by Nasdaq. BATS, BATS-Y, EDGA, and EDGX, which all operated as ATSs in 2005, are all subsidiaries of Cboe Global Market, Inc. Although many exchanges belong to exchange groups, the Commission preliminarily believes that each of these exchanges operates independently of the other exchanges owned by the same parent company. IEX became a registered exchange in 2016. Further, NSX (NYSE National) existed as an exchange in 2005, but halted operations in 2016. It was acquired by NYSE/ICE in January 2017, which indicated at the time of the acquisition that it will operate the exchange as NYSE National. See "NYSE Finalizes Acquisition of National Stock Exchange," Press Release, Intercontinental Exchange (January 31, 2017), available at: http://ir.theice.com/press/press-releases/all-categories/2017/01-31-2017-232800326. Researchers can adequately control for exchanges that are subsidiaries of the same parent when conducting analyses of the effect of changes in transaction-based fees on order routes.

287 See, e.g., Angel, Harris, and Spatt, supra notes 106 and 216; Harris, supra note 23.

288 See id.

the venue with the highest liquidity for a given stock.[289] If rebates offered by exchanges are large enough, they provide incentives for market participants to route orders to those venues, in order to capture the rebates. Rebates offered by exchanges, therefore, may "break" the liquidity externality.

Table 1: U.S. National Equities Exchanges as of July 2017

Exchange	Market Fee Type	Exchange in 2005?	Market Share[290]
Cboe BZX https://markets.cboe.com	Maker-Taker		5.95%
Cboe BYX https://markets.cboe.com	Taker-Maker		4.80%
Cboe EDGA[291] https://markets.cboe.com	Taker-Maker		1.64%
Cboe EDGX https://markets.cboe.com	Maker-Taker		6.38%
BX[292] www.nasdaqtrader.com	Taker-Maker	✓	3.02%
Phlx (PSX) www.nasdaqtrader.com	Maker-Taker	✓	0.76%
Nasdaq www.nasdaqtrader.com	Maker-Taker	✓	14.51%
NYSE Arca https://www.nyse.com/markets	Maker-Taker	✓	9.03%
NYSE American[293] https://www.nyse.com/markets	Maker-Taker	✓	0.34%
NYSE https://www.nyse.com/markets	Maker-Taker	✓	13.90%
NYSE National[294] https://www.nyse.com/markets	Maker-Taker	✓	
CHX www.chx.com	Maker-Taker	✓	0.42%
IEX www.iextrading.com			2.14%

289 Liquidity externalities are discussed in more detail in Section V.A.2, supra.

Table 1 also highlights that market share of trading volume among exchanges is not very concentrated. Although NYSE and Nasdaq have the largest overall total volume market shares of approximately 14% each among the exchanges, as of July 2017, these two exchanges collectively account for less than 30% of the total market share of trading volume for NMS securities, indicating that the market for trading services has become decentralized, and has become more so over time. For instance, between 2004 and 2013, the market share of NYSE-listed stocks on the NYSE declined from approximately 80% to 20%, while market share on other exchanges and off-exchange trading centers has increased.[295] This decentralization provides market participants with a choice among venues when they route orders, and may also encourage exchanges to attract order flow. For instance, transaction-based fees represent one means by which national securities exchanges may compete for order flow, and exchanges may

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290 Shares are computed based on share volume. Market shares for the exchanges reported do not add up to 100%, since approximately 37% of share volume trades off-exchange on over-the-counter venues.

291 As of March 2018, EDGA is no longer operating as a taker-maker exchange and is now operating as a flat-fee venue; however, it was operating as one as of July 2017 when the data for this table was obtained.

292 In 2005, BX existed as the Boston Stock Exchange.

293 As of July 2017, NYSE American is no longer a purely maker-taker market as only certain types of market participants (electronic Designated Market Makers) are eligible for rebates. See NYSE American Equities Price List, available at: https://www.nyse.com/publicdocs/nyse/markets/nyse-american/NYSE_America_Equities_Price_List.pdf.

294 NYSE acquired NSX in January 2017, and the exchange is now known as NYSE National. Although not currently operational, the Commission has assumed for the purposes of this analysis that it will be operational during the Pilot.

295 See Angel, Harris, and Spatt, supra note 216, Figures 2.17 and 2.18. Although less evident than for NYSE-listed securities, the effect is similar for the Nasdaq market.

adopt business models that focus on attracting order flow by offering large rebates or charging competitive fees. Exchanges may compete for order flow on other dimensions as well, by offering better execution quality and innovations in order types and other trading mechanisms.

In addition to competing with other U.S. equities exchanges, exchanges also compete for order flow from off-exchange trading centers, including ATSs, internalizers, and others. Broker-dealers may opt to route order flow off-exchange, as they may be able to avoid access fees paid to exchanges for doing so. Off-exchange trading makes up a substantial fraction of total volume, as approximately 37% of all transaction reports are routed using the NYSE and Nasdaq Trade Reporting Facilities as of July 2017.[296] Of that off-exchange NMS share volume, approximately 13% was attributable to ATSs, of which 34 traded NMS securities as of July 2017.[297] The remaining 24% of off-exchange share volume is routed to other off-exchange trading centers, such as internalizers.[298] In aggregate, broker-dealers and other market participants have a large and varied set of options as to where they route orders, whether to exchanges or to off-exchange trading centers. Moreover, empirical evidence suggests that traditional exchanges, such as NYSE and Nasdaq, are losing market share to off-exchange trading centers and newer

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296 Data on off-exchange market share are available from the BATS Global Market webpage, available at http://markets.cboe.com/us/equities/market_share/

297 The estimates of ATSs that trade NMS stocks and ATS trade volume share was developed using weekly summaries of trade volume collected from ATSs pursuant to FINRA Rule 4552. See also Securities Exchange Act Release No. 76474 (November 18, 2015), 80 FR 80998, 81109 (December 28, 2015) (Regulation of NMS Stock Alternative Trading Systems). The estimates in this release were calculated in the same manner as in the cited release. See also "OTC (ATS & Non-ATS) Transparency," FINRA, available at: http://www.finra.org/Industry/Compliance/MarketTransparency/ATS/.

298 Total market share is collected from the BATS Global Market webpage, available at: http://markets.cboe.com/us/equities/market_share/. ATS weekly market share is collected from FINRA, available at: https://otctransparency.finra.org.

exchanges,[299] which may provide different incentives to broker-dealers in order to attract this order flow, including access fees and rebates. We discuss the current environment for transaction-based fees in the next section.

The proposed Pilot is also likely to affect competition among broker-dealers that route institutional and retail orders. These broker-dealers compete in a segment of the market for broker-dealer services. The market for broker-dealer services is highly competitive, with most business concentrated among a small set of large broker-dealers and thousands of small broker-dealers competing in niche or regional segments of the market.[300] Large broker-dealers typically enjoy economies of scale over small broker-dealers and compete with each other to service the smaller broker-dealers, who are both their competitors and their customers.[301] As of December 31, 2016, approximately 4,000 broker-dealers filed Form X-17a-5. These firms varied in size, with median assets of approximately $725,000, average assets of nearly $1 billion, and total assets across all broker-dealers of approximately $3.9 trillion. The twenty largest broker-dealers held approximately 75% of the assets of broker-dealers overall, with total assets of $2.93 trillion, indicating the high degree of concentration in the industry. Of the 3,972 broker-dealers that filed Form X-17a-5, 430 are members of U.S. equities exchanges. Broker-dealers that are members of equities exchanges had, on average, higher total assets than other broker-dealers, with median assets of $21 million, average assets of $8.6 billion, and total assets across all broker-dealers that are members of exchanges of $3.6 trillion.

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299 See Angel, Harris, and Spatt, supra note 216.

300 See Securities Exchange Act Release No. 63241 (November 3, 2010), 75 FR 69791, 69822 (November 15, 2010) ("Risk Management Controls for Brokers or Dealers with Market Access").

301 See id.

b. Transaction-based Fees and Rebates

Exchanges are required to disclose their current fee schedules, which include transaction-based fees and rebates, connectivity fees, membership fees, among others.[302] When exchanges update their fees, they are required to file Form 19b-4 with the Commission, which if filed pursuant to Section 19(b)(3)(A) makes fee changes effective upon filing.[303] Although these fee schedules and Form 19b-4 fee filings contain information about fees beyond transaction-based fees and rebates, in this baseline, the discussion is limited to only transaction-based fees and rebates and any changes thereto.

Table 2 reports the range of minimum and maximum access fees and rebates, as well as the number of categories for each (in parentheses below the fee ranges), by exchange, for the most recently available fee schedule.[304] On average, U.S. exchanges have 24 access fee categories and 21 rebate categories associated with these fee schedules. For the maker-taker exchanges, access fees are capped at $0.0030, but are as little as zero in some fee categories for some exchanges; taker-maker exchanges, because they are not restricted in the amount they can charge to non-marketable limit orders, have fees that range as high as $0.0033. Seven exchanges have some categories of rebates that exceed the maximum access fees charged by exchanges.

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302 See 17 CFR 240.19b-4(m)(1), which requires each SRO to post and maintain a current and complete version of its rules, including those related to transaction-based fees and rebates, on its website.

303 As discussed in Section V.B.1.b.iii supra, fee information, such as that included in exchange fee schedules or Form 19b-4 fee filings, does not have standardization or formatting requirements.

304 The access fee and rebate ranges in Table 2 are collected from recent fee schedules (as of July 18, 2017) available from each individual exchange's website (listed in Table 1). Table 2 provides the date from which these fee schedules were reported. The ranges in fees are the minimum and maximum fees and rebates reported by each exchange.

Table 2 also provides the number of fee revisions for the exchanges as reported in their Form 19b-4 fee filings to the Commission in the last five years (July 16, 2012-July 18, 2017). Exchanges, on average, have changed their fee schedules 34 times in the last five years,[305] indicating that the average exchange revises its transaction-based fee schedules about seven times per year (approximately every 7.4 weeks).

Table 2: Summary of Transaction-Based Fee Schedules for
U.S. National Equities Exchanges as of July 2017

Exchange	Number of Revisions (5 years)	Date of Last Fee Schedule Available	Access Fees (# of Categories)	Rebates (# of Categories)
Cboe BZX	40	7/15/2017	\$0.0000-\$0.0030 (31)	\$0.0010-\$0.0032 (16)
Cboe BYX	45	7/15/2017	\$0.0000-\$0.0033 (36)	\$0.0010-\$0.0025 (12)
Cboe EDGA	47	7/15/2017	\$0.0000-\$0.0032 (48)	\$0.0011-\$0.0027 (10)
Cboe EDGX	64	7/15/2017	\$0.0000-\$0.0030 (37)	\$0.0011-\$0.0034 (19)
BX	31	7/13/2017	\$0.0005-\$0.0030 (10)	\$0.0000-\$0.0025 (8)
Phlx (PSX)	26	7/15/2017	\$0.0026-\$0.0030 (5)	\$0.0023-\$0.0031 (7)
Nasdaq	59	7/20/2017	\$0.0030 (2)	\$0.0000-\$0.0034 (36)
NYSE Arca	51	7/3/2017	\$0.0006-\$0.0030	\$0.0002-\$0.0033

305 The median number of revisions to fee and rebate schedules by exchanges is 38 over the five-year period.

			(68)	(61)
NYSE American	9	7/24/2017	$0.0003-$0.0030 (34)	$0.0000-$0.0045 (41)
NYSE	38	7/1/2017	$0.0003-$0.0030 (14)	$0.0000-$0.0045 (40)
NYSE National[306]	19	9/20/2016	$0.0003-$0.0030 (2)	$0.0000 (1)
CHX	8	5/3/2017	$0.0030 (1)	$0.0020 (1)
IEX	1	8/19/2016	$0.0009	-$0.0009

For several of the exchange families, information about revenues and costs attributed to transaction-based fees and rebates is available in aggregate from Form 10-K filings. Using the statements of income from Form 10-K filings for 2016 capturing the net (of rebates) transactions-based revenues, the Nasdaq exchanges (Nasdaq, BX, and PSX) earned $564 million.[307] Based on the same measure the NYSE-affiliated exchanges (NYSE, NYSE Arca, NYSE American, and NYSE National) earned $223 million in transaction-based fees net of rebates,[308] while the BATS Global Markets (now, Cboe BZX, Cboe BYX, Cboe EDGA, and Cboe EGDX), for the nine months ended September 30, 2016, earned $177 million in

306 NYSE acquired NSX in January 2017, and the exchange is now known as NYSE National. As of March 2018, the exchange currently has not submitted new fee schedules nor has it reported any trading volume in recent months.

307 See the Nasdaq 2016 Form 10-K filings, available at: https://www.sec.gov/Archives/edgar/data/1120193/000112019317000003/ndaq1231201610-k.htm. Net transaction-based revenues for equity securities were approximately 25% of total operating margin.

308 See the Intercontinental Exchange 2016 Form 10-K filings, available at: http://otp.investis.com/clients/us/intercontinental_exchange_group2/SEC/sec-show.aspx?Type=html&FilingId=11827791&Cik=0001571949. For the Intercontinental Exchange, net transaction-based revenues were approximately 10% of operating income for 2016.

transaction-based fees net of rebates.[309] Neither CHX nor IEX or their affiliates are publicly traded, meaning that these exchanges do not file an annual Form 10-K with the Commission. As a result, public information regarding the revenues or profits associated with transaction-based fees does not exist for these exchanges.

Information on the net transactions-based revenues for each individual exchange, as opposed to the amounts reported for exchange groups in Form 10-K filings, is not currently publicly available, making it difficult to analyze the fees and rebates for an individual exchange. To estimate the net transactions-based revenues for each individual exchange, Table 3 reports the maximum and median net transaction-based fees based on each exchange's most recently reported fee schedule and the share volume of each exchange for June 16, 2017 through July 18, 2017.[310] As evidenced by the significant differences between the sum of net of rebate revenues for entities reporting to the same exchange group obtained from Table 3 and the total net of rebate revenues for each exchange family reported on the Form 10-K or 10-Q filings, this approach does not yield reliable results, highlighting the limitations on the data currently available to researchers.

309 See the Bats Global Markets Form 10-Q filings (September 30, 2016), available at: http://www.snl.com/Cache/36600023.pdf. Cboe announced its intent to acquire BATS Global Markets in September 2016, and the acquisition became effective on March 1, 2017. For the nine-month ending September 30, 2016, the net transaction-based revenues were 62% of BATS operating profits over the same time period.

310 The share volume is obtained from the Cboe website, available at http://markets.cboe.com/us/equities/market_share/. To compute the maximum profit attainable, staff took the difference between the highest possible access fee and the lowest possible rebate and multiplied it by the monthly share volume. For a midpoint profit, the median of the access fees less the median of the rebates is computed and multiplied it by share volume. In order to make the results comparable to those reported above from Form 10-K filings, the monthly profits are annualized by multiplying each monthly profit amount by 12.

Table 3: Estimates of Annualized Per-Exchange Net Transaction-Based Fee Revenues (in millions) from Transaction-Based Fees and Monthly Exchange Share Volume (for June 16, 2017 – July 18, 2017)

Exchanges	Share Volume (millions)[311]	Annualized Midpoint Difference	Per Share Profit (Median)	Annualized Maximum Difference	Per Share Profit (Maximum)
Cboe BZX	8,677	($62.5)	($0.0006)	$208.2	$0.0020
Cboe BYX	7,003	($8.4)	($0.0001)	$193.3	$0.0023
Cboe EDGA	2,388	($8.6)	($0.0003)	$60.2	$0.0021
Cboe EDGX	9,310	($83.8)	($0.0008)	$212.3	$0.0019
BX	4,411	$24.5	$0.0005	$158.8	$0.0030
Phlx (PSX)	1,115	$1.3	$0.0001	$9.4	$0.0007
Nasdaq	21,171	$330.3	$0.0013	$762.2	$0.0030
NYSE Arca	13,175	$7.9	$0.0001	$442.7	$0.0028
NYSE American	494	($3.6)	($0.0006)	$17.8	$0.0030
NYSE	20,277	($146)	($0.0006)	$730	$0.0030
NYSE National					
CHX	609	$7.3	$0.0010	$7.3	$0.0010
IEX	3,117	N/A	$0.0000	N/A	$0.0000

C. <u>Analysis of Benefits and Costs of Proposed Transaction Fee Pilot</u>

1. Benefits of Proposed Transaction Fee Pilot

The Commission expects that the benefits of the proposed Transaction Fee Pilot would fall into two categories: more informed policy decisions, including more information about potential conflicts of interest between broker-dealers and their customers (primary benefits) and more information on other issues important to the Commission (ancillary benefits), as well as

311 Monthly share volume obtained from Cboe for June 16, 2017 through July 18, 2017, <u>available at</u> http://markets.cboe.com/us/equities/market_share/.

other benefits that may accrue to market participants for the duration of the proposed Pilot. In this section we discuss each of the categories of benefits as well as potential limitations to those benefits.

a. Benefits of More Informed Policy Decisions

i. Benefits of Studying Potential Conflicts of Interest

The Commission preliminarily believes that the proposed Transaction Fee Pilot would lead to a more thorough understanding of issues related to potential conflicts of interest arising from transaction-based pricing models, which would ultimately inform the Commission's policy decisions. This increased understanding would derive from design elements of the proposed Transaction Fee Pilot that address the limitations of currently available information described in the baseline: lack of representative results, inability to identify causality, and insufficient publicly available data. The data obtained will improve the quality of research and analysis by the Commission and others, which will provide additional data about the effect of transaction-based fees on order routing decisions of broker-dealers in ways that reflect potential conflicts of interest with their clients. The Commission believes that these additional data, which would be unavailable in the absence of the proposed Pilot, would help the Commission make more informed and effective future policy decisions to the ultimate benefit of investors.

To obtain the additional data to understand the relationship between fees and rebates and order routing decisions, the proposed Transaction Fee Pilot would simultaneously create several different fee environments, each of which restricts transaction-based fees differently, and would make available data that allows researchers to compare order routing, execution quality, and market quality in these fee environments to the current fee environment. The study of these comparisons would inform the Commission and the public about any possible conflicts of interest that arise as a result of transaction-based fees. The Commission preliminarily believes that the different fee environments created by the proposed Pilot, even though implemented temporarily and over representative subsamples NMS securities, would produce effects on order routing decisions by broker-dealers that are identical or similar to those that would arise under a similar permanent change to our regulatory environment. Therefore, the Commission preliminarily believes that the information obtained from the Pilot will help inform our consideration of any future proposals.

As noted, three distinct features of the proposed Pilot's design would facilitate analyses of the relationship, if any, between fees and potential conflicts of interest. Specifically, the proposed Pilot is designed to provide (1) representative results; (2) sufficient information to determine causality; and (3) more direct access to data that is currently unavailable or requires lengthy and labor-intensive effort to compile and process. The following sections discuss in detail each of these aspects of the proposed Pilot and how they could improve upon the information currently available.

A. Representative Results

In the context of the proposed Transaction Fee Pilot, representativeness of results means that the impact of the proposed Pilot's terms on a Test Group during the Pilot Period is likely to be consistent with the impact of the results on the Test Group if the Pilot's terms were permanent (as opposed to temporary). Representativeness is desirable for researchers and policy makers because it ensures that inferences drawn from the results of analysis of Pilot data are likely to be similar to those that would emerge if the terms were permanent. As discussed in the baseline, current analyses are limited in their ability to broadly inform policy choices by some combination of the following: order routing data from a single broker-dealer, a small sample of securities, a single exchange, or a short sample period. By contrast, the Commission preliminarily believes that the proposed Pilot, as designed, would produce more representative results. Specifically, as discussed in detail below, the proposed Pilot would cover a large stratified sample of nearly all NMS stocks (including ETPs), both maker-taker and taker-maker exchanges, and access fee caps as well as a prohibition on rebates or Linked Pricing, and would have a two-year duration with an automatic sunset at the end of the first year unless the Commission determines, at its discretion, that the proposed Pilot shall continue for up to another year.[312] The proposed Pilot also would capture and make available to the public for research and analysis, a comprehensive database of the order routing decisions of all broker-dealers that route orders to U.S. equities exchanges. As detailed in the baseline, it would be infeasible for researchers to compile current data sources across all broker-dealers.

The Commission preliminarily believes that the proposed Pilot would produce representative results, presenting a significant improvement on existing studies, because the proposed Pilot applies to a large stratified sample of NMS stocks (including ETPs) with prices of at least $2.00 per share at the date of the Pilot Securities selection, and with no restrictions on market capitalization. In particular, the Commission recognizes that any possible conflicts of interest related to transaction-based fees could vary across securities such that the results of a pilot focused only on large capitalization stocks may not provide information relevant to small capitalization stocks or ETPs.[313] Including nearly all NMS securities allows the results to inform policy choices across any subset of these securities. The stratification of the stocks selected for

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312 As designed, the proposed Pilot will only exclude NMS securities that have prices below $2.00 per share as of the date of pilot selection. As detailed above, the data would also be produced for a six-month pre-Pilot Period and a six-month post-Pilot Period.

313 See, e.g., Battalio Equity Market Study, supra note 22.

each test group is designed to ensure that each test group and the control group have a similar composition, facilitating a comparison across groups, which further supports the representativeness of results. If, for instance, the test groups and control group had a different composition, researchers might not be able to distinguish whether differences across test groups and the control group stem from different fee environments or different sample composition, rendering the results less representative. In addition, the Commission preliminarily believes that the sample sizes in the test groups are sufficient to provide the statistical power necessary to identify differences across the samples.

Representativeness of results of the Pilot would also be promoted by the choice of the Pilot Security selection date. The proposed rule would allow the Commission to select the Pilot Securities at any point in time up to Pilot start date. As noted in Section III.E.1, the Commission anticipates that it would assign and designate by notice each Pilot Security to one Test Group or the Control Group approximately one month prior to the start of the Pilot. By assigning securities close to the start of the Pilot, each Test Group and the Control Group are likely to be more comparable during the Pilot. Because stratification criteria (e.g., market capitalization and liquidity) vary naturally over time, the closer the assignments occurs to the proposed Pilot effective date, the more comparable the Test Groups would be during the proposed Pilot. Selection of securities close to the start of the proposed Pilot would also be more likely to include the intended universe of securities, by capturing securities that enter the market between the possible adoption of the rule and the start of the proposed Pilot, while avoiding securities that exit during this period. Further, to the extent that market participants would change their behavior in anticipation of the proposed Pilot, setting the selection period close to the proposed Pilot effective date could reduce the effect of such behavior on pre-Pilot data.

The results of the proposed Pilot would be further representative because the proposed Pilot applies to all U.S. equities exchanges regardless of fee structure. Broker-dealers potentially face transaction-fee related conflicts of interest regardless of whether those fees are on maker-taker exchanges or taker-maker exchanges. Further, a pilot that addresses only a single fee structure would not produce results relevant for policy choices that also would apply to another fee structure.

Applying the proposed Pilot to all exchanges also improves upon the existing analysis of the limited fee experiment conducted by Nasdaq, which only covered a single exchange, as explained in Section V.B.1. While the results from that study are suggestive that broker-dealers routed customer orders to other exchanges that did not change their transaction-based fees, reasons other than potential conflicts of interest could have impacted the changes in order routing decisions. The Commission believes that the proposed Pilot would achieve representativeness by requiring transaction-fee changes for all U.S. equities exchanges, which would allow researchers to identify how these revisions affect order routing decisions across exchanges. Further, the proposed Pilot would require that changes to fees or rebates would be applied at the security level, which means that for any given security, the limitation on access fees or rebates would be ubiquitous across all exchanges.

In addition, the proposed Pilot achieves representativeness by imposing access fee caps and a prohibition on rebates or Linked Pricing. The existing literature suggests that the potential conflicts of interest arising from access fees could induce behavior that would be different from the behavior induced from conflicts arising from rebates or Linked Pricing. Therefore, the inclusion of caps on both access fees and rebates or Linked Pricing allows for a more comprehensive analysis of any possible conflicts of interest than could be achieved by focusing solely on access fees or rebates. For example, Test Group 2 limits access fees to $0.0005, which could feasibly limit rebates paid on displayed liquidity, while Test Group 3 strictly prohibits rebates or Linked Pricing across the entire depth of book for displayed and non-displayed liquidity. On the surface, it appears that Test Groups 2 and 3 both could eliminate rebates paid to broker-dealers; however, these categories are not equal in their ability to reduce rebates.[314]

Test Group 3 would completely prohibit rebates or Linked Pricing, which could provide information on how exchanges compete for order flow when rebates are not an option for exchanges, and could provide insight into the equilibrium level of access fees in the absence of rebates or Linked Pricing.[315] Prohibiting exchanges from offering rebates or Linked Pricing in Test Group 3 is necessary to maintain the economic integrity of Test Group 3 and to provide information about Test Group 3 consistent with its objective to test the impact of eliminating rebates on the natural equilibrium level of fees, within the current regulatory structure, and the potential conflicts of interest that rebates may cause.[316] Although Rule 610(c) of Regulation NMS caps the maximum access fee for exchanges at $0.0030, in the absence of rebates or

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314 The Commission preliminarily believes that applying the top of book and depth of book restriction to Test Group 3, but not in Test Group 2, is not an area of significant difference between the two test groups. Section III.C.3, supra, provides discussion for why Test Groups 1 and 2 do not have requirements to access fees for non-displayed or depth-of-book liquidity.

315 Equilibrium refers to conditions of a system in which all competing influences are balanced. For instance, with respect to the Test Group 3, this could be the level of access fee charged by exchanges from which no exchange has any incentive to increase or decrease that fee. This would be the equilibrium access fee.

316 If Linked Pricing were not prohibited, market participants could potentially circumvent the prohibition on rebates through Linked Pricing mechanisms. Therefore, including prohibitions on rebates or Linked Pricing could provide information to the Commission and the public about potential conflicts of interest associated with rebates or substitutes for rebates, such as Linked Pricing, as well as the equilibrium fee that emerges in the absence of rebates or Linked Pricing.

Linked Pricing, competition among exchanges could drive the average access fee to an amount substantially below $0.0030.[317] In other words, Test Group 3 would allow competition among exchanges, in the absence of rebates or Linked Pricing, to determine the level of access fees from which exchanges have no incentive to move away.

The Commission further preliminarily believes that the duration of the proposed Pilot would produce sufficiently representative results. If broker-dealers incorporate transaction fees and rebates into their order routing decisions, a two-year duration for the proposed Pilot, with an automatic sunset at the end of the first year, unless the Commission publishes a notice determining that the proposed Pilot shall continue for up to a second year, would likely make it economically worthwhile for broker-dealers to change their routing behavior during the Pilot by making it costly to avoid the proposed Pilot. Specifically, as discussed below, the Commission recognizes that broker-dealers would incur costs to incorporate new fee schedules that are consistent with the proposed Pilot's requirements into their order routing decisions. Broker-dealers could ignore the Pilot to avoid these costs. If enough broker-dealers ignore the Pilot, the Pilot might not produce results that provide the Commission and the public a sense of the likely impact of permanent changes to fee caps or rebates. However, to the extent that broker-dealers incorporate transaction-based fees and rebates into their order routing decisions, ignoring the proposed Pilot would also be costly for broker-dealers, and these costs increase with the duration of the Pilot. The Commission preliminarily believes that the proposed Pilot duration, even with

317 In addition to removing rebates or Linked Pricing in Test Group 3, the Commission could also temporarily suspend limitations on access fee caps imposed by Rule 610(c) of Regulation NMS. However, implementing multiple changes within a single test group may prevent researchers and others from clearly determining the effect of the prohibition of rebates on order routing decisions of broker-dealers from the effect resulting from the removal of access fee caps.

a one-year sunset, is long enough to produce representative results because, as discussed below in Section V.C.2.b, broker-dealers that incorporate transaction-based fees and rebates into their routing decisions would find it economically worthwhile to adapt their behavior in response to the Pilot.

Further, the provision for an automatic sunset facilitates representative results because it provides the Commission with flexibility as the data from the proposed Pilot develops. For example, the Commission could suspend the sunset if, for example, it believed that additional time would help ensure that market developments are fully reflected in the data with sufficient statistical power for analysis, recognizing that such market developments are uncertain. Therefore, the sunset provides flexibility to the Commission to observe developments during the proposed Pilot to determine whether to allow the sunset to occur.

The Commission preliminarily believes that the inclusion of a broad sample of NMS securities, including small and mid-capitalization stocks, ensures representative results from the proposed Pilot. Although previous studies, as discussed above, suggest that any possible conflicts of interest are likely to be the greatest for small-capitalization securities,[318] the Commission believes that it is important to the design of the proposed Transaction Fee Pilot to include these small and mid-capitalization stocks (including ETPs).

As a result, small and mid-capitalization securities could be subject to both the Transaction Fee Pilot and the Tick Size Pilot for some period of time. However, the Commission preliminarily believes that any overlap between the pilots is unlikely. If the pilots do overlap, the proposed Pilot selection process facilitates the overlap with the Tick Size Pilot while maintaining representative results. In particular, the selection process for the proposed

318 See Battalio Equity Market Study, supra note 22; Harris, supra note 23.

Pilot would result in similar proportions of stocks impacted by the proposed Transaction Fee Pilot in each Tick Size Pilot test and control groups. Specifically, each of the proposed Transaction Fee Pilot's three test groups would be divided into two subgroups—one that overlaps with the Tick Size Pilot and one that does not overlap.[319] Assuming each pilot test group affects the other pilot's test and control groups similarly, this design safeguards the results of each pilot by ensuring that Tick Size Pilot effects are uniform across the proposed Transaction Fee Pilot and vice versa, such that researchers are able to control for effects of the Tick Size Pilot on the proposed Transaction Fee Pilot and vice versa.

B. Causality

In addition to providing representative results, the Commission expects the proposed Transaction Fee Pilot to achieve the benefits identified above because it would, among other things, provide insight into the degree to which transaction-based fees result in potential conflicts of interest that alter broker-dealer routing decisions to the detriment of investors. Such causal information is necessary when considering policy choices aimed at reducing any possible distortions related to potential conflicts of interest. As detailed in the baseline, exogenous shocks are a means by which researchers may establish the existence of a causal relationship between changes to transaction-based fees and changes to order routing decisions of broker-dealers and infer whether these decisions are related to possible conflicts of interest.[320] This proposed Pilot

319 Each test group would contain 270 common stocks that overlap with the Tick Size Pilot, with 45 stocks selected from each of the three Tick Size Pilot test groups (45 stocks x 3 Tick Size Pilot groups = 135 total) with the remaining 135 stocks coming from the Tick Size Pilot's control group. See supra note 117 and accompanying text.

320 As discussed in the baseline, establishing causality can be accomplished through either exogenous shocks or econometric methods, such as instrumental variable analysis. As noted above, the Battalio Equity Market Study, supra note 22, which employed an

facilitates the establishment of causality through an exogenous shock that simultaneously creates several distinct fee environments, each of which restricts transaction-based fees or rebates differently, enabling synchronized comparisons to the current environment.

The Commission preliminarily believes that the proposed Pilot is able to facilitate the examination of causality because the proposed Pilot would produce a single exogenous shock that differentially impacts either fees or rebates on both maker-taker and taker-maker exchanges. Although exchanges adjust their fee schedules frequently, which could affect the order routing decisions of broker-dealers, researchers have, to date, been unable to determine whether these discretionary changes to fees cause order routing decisions or whether order routing decisions cause the changes in fees. With the exception of the Nasdaq study, which lacks representative results, prior analyses lacked an exogenous shock to fees, thus any conclusions about causality that are drawn from these studies may not provide reliable information about possible conflicts of interest.[321] Exogenous shocks, such as those in the proposed Transaction Fee Pilot provide researchers a clear means of analyzing the direction of causality.[322]

As discussed above, the proposed Pilot would produce a single exogenous shock that differentially affects multiple test groups. The simultaneity of the exogenous shocks across test groups also facilitates examination of causality. If some market-wide event were to result in

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instrumental variables approach, was unable to definitely establish causal relations between transaction-based fees and rebates and order routing decisions.

321 Although the Nasdaq study provides an exogenous shock to both access fees and rebates simultaneously for a subset of securities, the value of the results are impeded by (1) the small sample size of the study and (2) the limit of the shock to a single exchange, as broker-dealers could just route order flow to a different exchange. See supra note 31.

322 Other econometric techniques, such as instrumental variables methodology, are used only when an exogenous shock (or other controlled experiment) cannot be established.

deviations in order routing behavior during the proposed Transaction Fee Pilot, the event would likely affect stocks in each test group as well as the control group. Researchers can easily control for the impact of the market-wide event, because the impact of the market-wide event would likely affect test groups and the control group similarly, and therefore, would be unlikely to appear in the comparisons of the test groups to the control group. By contrast, if the exogenous shocks were not simultaneous, the market-wide event may impact only one test group, complicating the comparisons of that test group to the baseline period or to the other test groups.

The design of the proposed Pilot further enhances researchers' ability to identify causal relationships. The Commission preliminarily believes that publishing daily updates to the List of Pilot Securities facilitates the identification of causal relations between transaction-based fees and order routing decisions. By requiring daily updates to the List of Pilot Securities, the proposed Pilot would provide broker-dealers with the information they need to track the exact securities in each test group in real-time and when securities exit the Pilot. This information may be crucial for broker-dealers that choose to adjust their routing behavior during the pilot. If broker-dealers are unable to track which securities are in which test groups, the Pilot results could provide misleading causal information.

C. Expansion of Publicly Available Data

The Commission also expects the Transaction Fee Pilot to attain the benefits identified above because it would provide access to data that would either not be available to the public or that would require lengthy and labor-intensive collection. Having a representative source of data available to the public is critical for the production of research and analyses about the effect of transaction-based fees on broker-dealer order routing decisions. If more research and analyses become available, that research is more likely to provide increased depth and perspective on potential conflicts of interest to the Commission. Making the data available to the public also provides transparency and allows others to replicate, validate, and confirm the information that the Commission considers in connection with policy choices.

The Commission preliminarily believes that the proposed data requirements improve upon existing data, as is discussed in more detail below; thus, any inferences drawn from existing data sources prior to the proposed pilot would likely have limited value in providing information about the effect of transaction-based fees on order routing decisions. The Pilot's characteristics would enable representative results and a means to examine the exogenous shocks to transaction-based fees. The public availability of the Pilot data would facilitate study of whether the exogenous shocks to transaction-based fees affect order routing and are related to potential conflicts of interest between broker-dealers and their customers. The proposed Pilot would make information on order routing decisions available on a more granular level and would reduce the cumbersome nature of data collection associated with existing order routing data and fee data.

The Transaction Fee Pilot would enable the public to gain access to order routing data not currently available to them and would provide access to fee data in a simplified and standardized form, which would improve the quality of the analyses produced as a result of the Pilot. Although order routing data and fee schedules are publicly available through a combination of Rule 606 disclosures and exchange websites, respectively, the Transaction Fee Pilot would resolve a number of limitations associated with using currently available data to study the effect of transaction-based fees on potential conflicts of interest.   Further, the proposed Pilot would make available broker-dealer order routing data for all exchange-member broker-dealers for the

Pilot duration, which substantially expands the data that would be available to researchers in the absence of the Pilot.

The Transaction Fee Pilot would make available to the public new data on order routing decisions anonymized and aggregated by day, by security, by broker-dealer, and by exchange. This data would facilitate the analyses of aggregated daily order-routing decisions for a comprehensive sample of broker-dealers, which are likely to provide representative results of how changes in transaction fees and rebates affect these decisions. Even if the Commission were to require a historical time series of a complete set of broker-dealer Rule 606 disclosures to be made publicly available, the limitations presented in Section V.B.1 would still exist, namely data frequency, which likely would limit any statistical power associated with analyses of the data, non-disclosure of potential conflicts of interest related to transaction-based fees, and the focus on retail orders.

The order routing data obtained as a result of the proposed Pilot would instead provide superior information to that currently available. Data would be available for a representative sample of NMS securities, across all broker-dealers, and exchanges, at the daily frequency, which would provide sufficient data for analyses, while solving the issue of statistical power. Relative to the data that some studies acquire from broker-dealers and exchanges,[323] the order routing data released during the Transaction Fee Pilot would also allow researchers to observe a time series of data across broker-dealers and exchanges. The reduction in the start-up costs of examining order routing data, where start-up costs could include hand-collection of data over long time series, would likely encourage more research that would utilize data from the Transaction Fee Pilot. Further, more granular order routing data (e.g., daily order routing

323 See, e.g., Battalio Equity Market Study, supra note 22.

statistics by anonymized broker-dealer) would facilitate more targeted analysis. Together, these effects would facilitate higher quality research on issues such as potential conflicts of interest, which would improve the quality of the information available to the Commission for policy decisions.

An additional requirement of the proposed Pilot is that the exchanges would be required to provide a standardized dataset of fees, the Exchange Transaction Fee Summary. Although researchers could identify some of the effects of changes to transaction-based fees and rebates on order routing decisions directly from knowing which securities are in a given test group, these data could improve the quality of tests of the Pilot by allowing researchers to incorporate information on how exchanges vary cross-sectionally in their fee and rebate structures, even within the various test groups. In particular, this information would allow researchers to create proxies for which exchanges are likely to be more or less expensive for marketable or marketable limit orders. For instance, within Test Group 1, the maximum allowable access fee is \$0.0015; however, each exchange may have different base and top-tier fees. Thus, only knowing that a security is in Test Group 1 would be incomplete information about how orders might be routed by broker-dealers to different exchanges, and the Exchange Transaction Fee Summary would provide that information. Moreover, the Exchange Transaction Fee Summary would provide researchers with historical (realized) average and median per share fees and rebates to provide an ex post analysis of how actual fees affected order routing decisions from the prior period, which is not available from any data source today. This information provides another avenue for researchers to identify exchanges that are more expensive or less expensive using actual past fees instead of a fee schedule that varies widely across participants.

Exchanges would construct Exchange Transaction Fee Summaries according to an XML schema to be published on the Commission's website, and exchanges would update this information monthly.[324] These data would be standardized and consistently formatted, which would ease the use of these data for researchers, as each exchange would have to report the base, top-tier, average, and median fees, as detailed above in Section III.E.2. Each month, exchanges would be required to report realized average and median per share fees, as well as any "spot" revisions to fees associated with Form 19b-4 fee filings to the Commission. These fee data would be publicly posted on each exchange's website.[325]

The Exchange Transaction Fee Summary released during the Pilot would: (1) ease aggregation across exchanges, which affords researchers an opportunity to obtain representative results; (2) replicate across studies, which would provide validation of findings; and (3) reduce burdens associated with fee data collection, which could encourage more research on the impact of fees and rebates on routing behavior. Because each exchange would be required to provide its Exchange Transaction Fee Summary using the Commission's XML schema, data on fees and rebates would be produced in a structured and standardized format, allowing researchers to easily aggregate and compile the data across all of the U.S. equities exchanges. The format of the data would facilitate the ability of a researcher to obtain representativeness in her results, which could enhance current views on possible conflicts of interest related to transaction-based fees.

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[324] The standardized fee data, as would be required by the proposed Pilot, is discussed in Section III.E.2, supra.

[325] Proposed Rule 610(T) requires each exchange to publicly post on its website downloadable files containing the Exchange Transaction Fee Summary and update them on a monthly basis. Similarly, each exchange would be required to publicly post on its website downloadable files containing daily aggregated and anonymized order routing statistics, updated monthly. Each exchange would also be required to provide daily on its website downloadable files containing the List of Pilot Securities and the Pilot Securities Change List.

Moreover, because all researchers would have access to the same set of data on transaction-based fees and rebates, they would be able to replicate, validate, and confirm the analyses of one another, which would be difficult to do with existing data sources. Unlike currently available fee data, downloadable files containing the Exchange Transaction Fee Summary would be publicly posted on each exchange's website and would provide researchers with consistent measures of various categories of fees and rebates, described in Section III.E.2, thereby reducing costs to researchers to collect and analyze the data provided. Thus, the Commission preliminarily believes that a standardized reporting of summary data on fees by the exchanges would facilitate analysis of the effect of transaction-based fees on order routing decisions by broker-dealers.

The proposed rule would require that the Exchange Transaction Fee Summary be structured using an XML schema to be published on the Commission's website. Data that are structured in a standard format can result in lower costs to analysts and higher quality data. An additional key benefit of structured data is increased usability. If, for instance, the Exchange Transaction Fee Summary were not standardized across the exchanges, researchers would have to manually rekey the data, a time-consuming process which has the potential to introduce a variety of errors, such as inadvertently keying in the wrong data or interpreting the filings inconsistently, thereby reducing comparability. With the data in the reports structured in XML, researchers could immediately download the information directly into databases and use various software packages for viewing, manipulation, aggregation, comparison, and analysis. This would enhance their ability to conduct large-scale analysis and immediate comparison of the fee structures of exchanges. The Commission preliminarily believes that requiring these reports to be made available in an XML format would provide flexibility to researchers and would facilitate statistical and comparative analyses across exchanges, test groups, and date ranges.

Moreover, as an open standard, XML is widely available to the public at no cost. As an open standard, XML is maintained by an industry consensus-based organization, rather than the Commission, and undergoes constant review. As updates to XML or industry practice develop, the Commission's XML schema may also have to be updated to reflect the updates in technology. In those cases, the supported version of the XML schema would be published on the Commission's website and the outdated version of the schema would be removed in order to maintain data quality and consistency with the XML standard.

The Commission's proposed XML schema would also incorporate certain validations to help ensure data quality. Validations are restrictions placed on the formatting for each data element so that comparable data are presented comparably. Complete and appropriately formatted data enhances data users' abilities to normalize and aggregate the data for review and analysis. The validations incorporated into the schema would be effective for checking data completeness and appropriate formatting, and would help the exchanges ensure that the data they post adheres to the Commission's XML schema in completeness and formatting.[326] Accordingly, the Exchange Transaction Fee Summary reports made available by exchanges in XML format pursuant to the proposed rule would have to be validated against the most recent XML schema published on the Commission's website.

ii. Benefits of Studying Other Economic Effects

In addition to potential conflicts of interest, a number of studies have expressed other concerns related to transaction-based fees. For example, studies predict that transaction-based

[326] These validations, however, will not test for the underlying accuracy of the data.

fee pricing has led to increased market fragmentation and complexity.[327] As an ancillary benefit to the Transaction Fee Pilot, the Commission and the public possibly could obtain data to facilitate analyses and research relating to the effects of fees and rebates on market fragmentation and market complexity in addition to those designed to study the potential conflicts of interest. These analyses are likely to be informative to the Commission as it evaluates future policy decisions.

Through the use of the order routing data from the Transaction Fee Pilot, researchers would be able to study order flow among different venues, which could provide insights into whether changes in transaction-based fees affect the current baseline of competition between exchanges and off-exchange trading centers, even in the absence of potential conflicts of interest. Existing literature suggests that transaction-based pricing has contributed to an increase in the number of venues competing for order flow over time.[328] By offering rebates or Linked Pricing, start-up maker-taker and taker-maker trading centers have been able to attract order flow from exchanges such as NYSE and Nasdaq, thereby reducing liquidity externalities, or concentration of order flow to a preferred venue, and leading to increased fragmentation of the market for

327 See, e.g., Thierry Foucault, Ohad Kadan, and Eugene Kandel, "Limit Order Book as a Market for Liquidity," Review of Financial Studies 18, 1171-1217 (2005), available at: https://academic.oup.com/rfs/article/18/4/1171/1595760 ("Foucault et al. (2005)"); Marios Panayides, Barbara Rindi, and Ingrid Werner, "Trading Fees and Intermarket Competition," Working Paper, University of Pittsburgh (2017) available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2910438 ("Panayides et al. (2017)"). Panayides et al. (2017) builds on the theoretical model of Foucault et al. (2005) and finds a decline in market quality and fraction of order flow to an exchange as its relative rebate declines or the take fee increases.

328 As discussed in the baseline, the number of exchanges has increased since 2005, and market share has become less concentrated over the same time period. These exchanges are not fully independent; the majority of the U.S. equities exchanges belong to three exchange groups. The Commission preliminarily believes that any analyses of the effects of transaction-based fees on order routing decisions can appropriately control for exchange groups.

trading services. By altering the access fee and rebate structures for exchanges, researchers may be able to identify whether these changes lead to more (or less) concentration of liquidity and how they affect competition for order flow among exchanges, which could lead to less (or more) market fragmentation. The effect of transaction-based fees on market fragmentation could not be examined in the absence of the Pilot.

By design, the Transaction Fee Pilot would alter access fees and rebates in some test groups, also providing researchers with information on how these revisions affect the quoted spreads (e.g., whether the spreads widen or narrow). The width of the quoted spread is considered to be an indicator of a stock's liquidity, with narrower spreads generally indicating more liquid securities. The proposed Pilot could provide information on whether fees and rebates affect the liquidity of securities, as measured by the quoted spreads, across different test groups. Existing studies suggest that quoted spreads appear to decline as liquidity rebates increase;[329] thus, rebates appear to decrease the cost of trading (and narrow the NBBO), thereby potentially improving investor and market welfare.[330] For some marketable orders, the net spread (the quoted spread plus the cost of access fees) is wider than the quoted spread, thereby potentially reducing transparency because quoted spreads (for at least some orders,) are different from the net spread, yet most retail customers are unaware of the difference.[331] Without

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329 See Angel, Harris, and Spatt, supra notes 106 and 216; Brolley and Malinova, supra note 24; Harris, supra note 23; O'Donoghue, supra note 24.

330 See Brolley and Malinova, supra note 24. Academic studies suggest that the majority of retail orders are executed off-exchange at prices based on the NBBO, thereby providing retail investors with better prices in the presence of rebates. If, however, large rebates provide incentives for broker-dealers to route retail orders to these exchanges instead of to off-exchange venues, retail customers may not be fully aware of the total cost associated with their orders. See e.g., Angel, Harris, and Spatt, supra notes 106 and 216.

331 See Harris, supra note 23.

transparency of the fees and rebates assessed to traders, the true costs of trading may be concealed, thereby creating a distortion between the quoted spread and the net cost of trading. Additional distortions between the quoted spread and the net costs for customers arise because orders are priced on different schedules in different markets.[332] Even if several trading centers match the NBBO, the magnitude of the access fees and liquidity rebates could significantly affect the net price paid by customers.[333]

iii. Potential Limitations on the Benefits

The Commission recognizes that pilots are unpredictable and as such considered whether possible limitations associated with pilots generally, as well as certain issues presented by the design of this pilot in particular, would limit the benefits of the Transaction Fee Pilot. The Commission preliminarily believes that the limitations of pilots, some of which may affect the Transaction Fee Pilot as discussed below, should not impede its success. This section discusses, in greater detail below, issues associated with pilots in general and the potential concerns with resultant research and analyses, as well as overlap with the Tick Size Pilot.

Pilots may face limitations related to the unpredictable nature of market conditions and confounding events. Even if a pilot lasted several years, not all of the market conditions of interest could be experienced. Depending on the requirements of pilots, such limitations might reduce the usefulness of the information obtained.[334] The Commission preliminarily believes,

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332 See Angel, Harris, and Spatt, supra notes 106.

333 See Battalio Equity Market Study, supra note 22.

334 For instance, a pilot could be designed where the information obtained from the proposed Pilot would only be valuable if certain market conditions, such as high market volatility or a recessionary period occurred. If, however, markets experience low volatility or are in an expansionary period, the proposed Pilot may either not be sufficiently long enough to capture the events that it requires to be useful or would have to be extended to ensure that those market conditions could occur.

however, that the value of the information obtained from the proposed Transaction Fee Pilot is not dependent upon having variation in market conditions over time, and that the duration of the proposed Pilot would provide sufficient information for future analyses.

In addition, pilots also face the limitation that market participants, knowing that a pilot is underway, may not act as they would in a permanent regime.[335] In the context of this pilot, broker-dealers could choose to retain their current order-routing decisions for the duration of the proposed Pilot, which could be costly to such broker-dealers.[336] Broker-dealers, when deciding whether to adjust any order routing behavior that currently depends on fees and rebates, would likely trade off the costs of retaining strategies that are no longer profitable because of the restrictions imposed by the proposed Pilot against the costs of adjusting the algorithms for their smart order routing systems, as explained below Section V.C.2. The costs of "waiting out" the pilot increase with the duration of the pilot, whereas the costs of adjusting the algorithms of the smart order routers do not. Alternatively, broker-dealers could substantially change their

335 For example, one study provided evidence suggesting that trading behavior may not have completely adjusted to the Regulation SHO pilot. See, Ekkehart Boehmer, Charles Jones, and Xiaoyun Zhang, "Unshackling Short Sellers: The Repeal of the Uptick Rule," Working Paper, Columbia University (2008), available at: https://www0.gsb.columbia.edu/faculty/cjones/UptickRepealDec11.pdf. Despite this effect, the study found evidence consistent with the evidence gathered from the Regulation SHO pilot. See Securities Exchange Act Release No. 50103 (July 28, 2004), 69 FR 48008 (August 6, 2004) ("Regulation SHO").

336 If broker-dealers have smart order routing systems that use algorithms that maximize rebate capture, as suggested in the Battalio Equity Market Study, supra note 22, then for at least some subset of securities, broker-dealers would not be able to pursue rebates from those exchanges, so it would be suboptimal for broker-dealers to not reconsider their order routing choices. If broker-dealers, however, already have order routing decisions that are optimal from a customer's perspective (i.e., based on execution quality) and are not driven by potential conflicts of interest (i.e., maximizing rebates), then for at least some broker-dealers, their order routing decisions may be unchanged, particularly if execution quality does not migrate between exchanges as a result of the implementation of the proposed Pilot.

business model in order to avoid the Pilot.[337] Either of these outcomes could lead to results that would not represent the effects of a permanent rule change. The Commission preliminarily believes that it is unlikely that broker-dealers would maintain existing order routing decisions or alter their business models to avoid the Pilot. In particular, the Commission preliminarily believes that the proposed Pilot duration is likely to make it economically worthwhile for broker-dealers to adjust their order routing behavior, as the total costs of changes to order routing systems are estimated to be on average approximately $42,900 per broker-dealer, if the Pilot were to automatically sunset at the end of the first year.[338] Further, although the proposed Pilot could automatically sunset at the end of the first year, the Commission retains the flexibility to suspend the sunset to continue the proposed Pilot for up to an additional year, at its discretion, if the Commission believes that it needs additional data for any reason.

In order to facilitate analysis of data during the Pilot Period, the Commission believes that it is important to collect sufficient data during a pre-Pilot Period. The pre-Pilot data can then be compared with the data that would be produced during the Pilot Period, which would permit analysis of any changes to order routing behavior, execution quality, and market quality between the two for the Pilot Securities in each of the Test Groups. To make this comparison informative, the length of the pre-Pilot Period needs to be long enough to obtain sufficient statistical power to permit analysis of the stocks and ETP Pilot Securities. In turn, sufficient

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337 It could be costly for broker-dealers to completely alter their business models because they may not find it worthwhile to do so for a temporary pilot. Further, if a broker-dealer has discretionary control over a customer's account, the broker-dealer could alter their business model by overweighting stocks in the control group and underweighting stocks in Test Group 3, if the objective of the broker-dealer is to continue to capture rebates.

338 The costs for broker-dealers to update their order routing systems are detailed in Section V.C.2.f. If the proposed Pilot were extended for up to an additional year, the total costs to broker-dealers would be approximately $67,000 per broker-dealer.

statistical power in tests that compare the pre-Pilot data to the Pilot data would allow the Commission and others to more easily use the information obtained from the Pilot to inform future regulatory consideration of exchange transaction fees and their impact on the markets.[339] The Commission preliminarily believes that at least six months of pre-Pilot data may be required to obtain the necessary statistical power to permit analysis of the Pilot Securities during the Pilot, particularly ETPs.[340] Without sufficient statistical power, researchers cannot use statistical techniques to distinguish between a pilot that has no effect and pilot data that do not provide enough power to detect an effect. In such situations, in order to have sufficient data to obtain statistical power, researchers would have to wait until the conclusion of the post-Pilot period to gather additional data, likely delaying the initial results of the proposed Pilot and the Commission's consideration thereof.

Furthermore, a short pre-Pilot Period introduces additional risk that analysis of certain Pilot data may be uninformative. Even if researchers were to wait until the conclusion of the post-Pilot period to begin analysis, they may not be able to identify the effects of the Pilot because data obtained from the post-Pilot period could be confounded by information about the Pilot. For example, if exchanges alter their fee structures in the post-Pilot period as a result of the Pilot (rather than revert back to their fee models in effect prior to the Pilot), data from the post-Pilot period likely would be unable to supplement or substitute for data obtained from a shorter pre-Pilot Period, underscoring the importance of a longer pre-Pilot Period. Thus, the value of any analyses obtained from the Pilot may be limited, thereby reducing the information obtained from such analyses for any potential regulatory recommendations.

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[339] See supra note 118.

[340] See supra note 430.

The Commission preliminarily does not believe that the benefits of the proposed Transaction Fee Pilot would be limited by the potential overlap with the Tick Size Pilot. For at least some portion of the proposed Transaction Fee Pilot's pre-period or Pilot Period, a sample of small and mid-capitalization stocks could simultaneously be subject to two pilots.[341] Two potential issues associated with the overlap between the pilots could lead to incorrect inferences in any analyses of the data produced by the proposed Pilot.[342] First, researchers would have to create additional control groups to account for the overlap with the Tick Size Pilot, which potentially increases the costs for researchers to study the proposed Transaction Fee Pilot. Second, the interaction between the test groups arising from the overlap may not be consistent across test groups.[343] However, the Commission preliminarily believes that researchers could appropriately control for such interaction in their analyses of either pilot.

The Commission recognizes that the data obtained from the Transaction Fee Pilot would not be straightforward to study. Specifically, the changes in fees or rebates imposed by the proposed Pilot may change transaction costs in a way that results in changes to order routing

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341 Sections V.C.2.b and V.D.3, infra, discuss more thoroughly the implications for small and mid-capitalization issuers.

342 In addition to these two issues, there may not be sufficient statistical power to jointly test the impact of being in test groups of both pilots. Given the limited number of securities that would, for example, be part of Test Group 1 of the Transaction Fee Pilot and Test Group 1 of the Tick Size Pilot (45 stocks), a substantial number of time series observations would likely be necessary to achieve statistical power. Depending on when the Transaction Fee Pilot becomes effective, there may only be limited overlap between the two pilots, if any. However, understanding the joint impact is not the reason for overlapping the pilots.

343 The stratification approach that would be used to construct the test groups assumes that the impact of changes to fees and rebates would be the same across all Tick Size Pilot test groups, and that representativeness would be maintained. If the impacts are different, then a researcher might not be able to control for all of the interactions, potentially undermining the reliability of the results.

decisions by broker-dealers, even absent potential conflicts of interest. Studying how order routing changes during the proposed Pilot, without jointly studying why it changes, would not be sufficient to understand any possible conflicts of interest. Researchers can carefully select and apply sophisticated econometric techniques to distinguish the proportion of changes in order routing decisions resulting from execution quality considerations from those resulting from potential conflicts of interest. Nonetheless, this complication could reduce the number and/or quality of studies of the proposed Transaction Fee Pilot.

b. Other Benefits of the Proposed Transaction Fee Pilot

Other benefits may emerge that would affect markets and market participants for the duration of the proposed Pilot, such as reduced conflicts of interest for some test groups or lower all-in costs of trading. As discussed in further detail below, the Commission preliminarily believes that other likely benefits of this proposal would be temporary in nature and affect markets and market participants only for the duration of the proposed Pilot.

The potential conflicts of interest discussed above could be mitigated during the duration of the proposed Pilot for investors in at least some subset of securities. For instance, in Test Group 2 where access fees are lowered or Test Group 3 where rebates or Linked Pricing are prohibited, broker-dealers may alter their order routing behavior because the incentives to capture rebates or Linked Pricing are lessened or removed from this subset of securities. The Commission notes, as discussed in the baseline section, that it lacks sufficient evidence of these potential conflicts of interest to ascertain the harm to investors from the conflicts; instead, the proposal itself would be a mechanism for ascertaining the magnitude of any such benefits. Therefore, the Commission at this time is uncertain of the magnitude of these benefits.

For at least some subsets of securities where rebates are likely to be reduced to de minimis levels or eliminated entirely for the duration of the proposed Pilot, broker-dealers could increase the routing of customer orders to off-exchange trading centers, such as ATSs. When broker-dealers can no longer capture rebates or Linked Pricing for some subsets of securities, they could change their order routing to off-exchange trading centers, because this would allow these broker-dealers to avoid access fees for marketable orders. Off-exchange trading centers are required to match the prevailing NBBO, and the Commission understands that most ATSs do not charge access fees or pay rebates and could temporarily reduce the all-in costs of trading for orders routed off-exchange.[344]

As an additional temporary benefit resulting from the proposed Pilot, lower access fees or eliminated rebates or Linked Pricing in some test groups could drive down the cost of routing orders to exchanges, which could draw order flow away from ATSs and back to exchanges, potentially resulting in an improvement in exchange execution quality. A reduction in access fees in proposed Transaction Fee Pilot test groups could induce broker-dealers to route more marketable orders to maker-taker exchanges. As marketable orders increase on maker-taker exchanges, under the assumption that broker-dealers route orders in their customer's best interest, non-marketable orders could also be routed to the same exchanges, because the likelihood of execution and possibly the speed of execution improve for non-marketable orders

[344] In addition to the potentially lower all-in costs of trading for orders routed off-exchange, ATSs also reduce the likelihood of price impact associated with large trades, as those investors trading blocks of shares could potentially reduce the price impact of their trades by crossing orders off-exchange, which could reduce the likelihood that other market participants find out about the order ahead of the execution. See Jennifer Conrad, Kevin Johnson, and Sunil Wahal, "Institutional Trading and Alternative Trading Systems," Journal of Financial Economics 70, 99-114, (2003) available at https://www.sciencedirect.com/science/article/pii/S0304405X03001430.

with an increase in marketable orders. Thus, as a by-product of the proposed Pilot, exchanges temporarily may see improvements in their overall execution quality and may see an increase in routing of order flow by broker-dealers even in the absence of large rebates. This could benefit investors as they may temporarily obtain better execution quality or price improvement for some securities that they would not otherwise obtain in the absence of the proposed Pilot.

The exogenous shock to fees and rebates also could temporarily affect the transparency of quoted spreads. Several studies suggest that access fees and rebates, while narrowing the quoted spread, increase the net cost of trading but in a way that is not transparent to investors.[345] Reductions to access fees and rebates could increase the transparency of the all-in costs of trading for investors. Although the proposed Pilot is not designed to provide investors with full transparency of the net costs of trading, for at least some test groups, where rebates are likely to be reduced to de minimis levels or prohibited outright, investors may obtain partial transparency on how rebates affect quoted spreads and possibly the all-in costs of trading. This effect could be particularly important for small and mid-capitalization securities, where price transparency may be low and which are likely to experience an increase in spreads, and could subsequently reduce liquidity for these securities as a result of the exogenous shocks to fees and rebates. Therefore, for the duration of the proposed Pilot, an unintended benefit to investors in these securities is that prices may be more transparent as the all-in costs of trading are closer to the true economic net cost as reflected in the displayed quotes.

The Commission preliminarily believes that another temporary benefit of the proposal would be that the proposed Transaction Fee Pilot could prevent some traders from indirectly

[345] See Angel, Harris, and Spatt, supra notes 106 and 216.

quoting in sub-pennies.[346] Rebates have the practical effect of reducing the minimum tick size by the size of the rebate, and in effect allow trading centers to offer quotations superior to the existing quote. Several studies suggested that the use of fees and rebates to effectively undercut quotations by sub-pennies is particularly severe in taker-maker markets.[347] The proposed Transaction Fee Pilot would, in some test groups, reduce or eliminate rebates, which could stem this indirect reduction of tick sizes, and could provide the Commission and the public with information currently unavailable about the frequency of this issue.

2. Costs of Proposed Transaction Fee Pilot

This section describes the compliance costs associated with the proposed Transaction Fee Pilot, followed by the additional temporary costs that could affect issuers, investors, broker-dealers, exchanges, and other market participants resulting from the proposed Pilot.

a. Exchange Compliance Costs of the Proposed Transaction Fee Pilot

The proposed Pilot would impose costs on exchanges to comply with the Pilot's requirements to collect, calculate, and publicly post data required by the Pilot on their websites, as well as to implement the required fee changes. An overview of the requirements of the proposed Pilot are presented in this section, and are discussed in more detail below. Specifically, exchanges that serve as the primary listing market would be required to publicly post on their

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346 Rule 612 of Regulation NMS prohibits traders from submitting sub-penny quotations on securities trading at prices over $1.00. The purpose of the sub-penny quotation prohibition was two-fold: (1) to prevent high frequency traders from front-running standing non-marketable limit orders and (2) to reduce the complexity of trading systems. See NMS Adopting Release, supra note 1, at 37550-57.

347 See, e.g., Angel, Harris, and Spatt, supra note 216; Harris, supra note 23. One study noted that as a result of the Tick Size Pilot test group with the trade-at provision, taker-maker markets have seen a significant increase in market share, in part due to this quotation issue. See Carole Comerton-Forde, Vincent Gregoire, and Zhuo Zhong, "Inverted Fee Venues and Market Quality," Working Paper, University of Melbourne (2017), available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2939012.

websites downloadable files containing the Pilot Securities Exchange List, derived from the initial List of Pilot Securities published on the Commission's website by notice, as well as maintain and update the Pilot Securities Exchange List as necessary prior to the beginning of trading on each trading day. Separately, prior to the beginning of trading on each trading day and throughout the duration of the proposed Pilot, each primary listing exchange shall publicly post on its website a downloadable file containing a Pilot Securities Change List, which lists each separate change applicable to any Pilot Security (i.e., name changes, mergers, or other corporate events) for which the exchange serves or has served as the primary listing exchange.[348]

The proposed Pilot would also require that each exchange provide a monthly standardized Exchange Transaction Fee Summary, detailed in Section III.E.2, which includes information on the initial list of fees and rebates associated with each test group and the control group, as well as changes to those fees and rebates corresponding with Form 19b-4 fee filings made to the Commission. In addition to the base and top-tier fees and rebates required in the Exchange Transaction Fee Summary, exchanges would also be required to calculate and publicly post on their websites the realized monthly average and median per share fees and rebates as part of the Exchange Transaction Fee Summary.

As discussed in more detail in Section III.E.3, equities exchanges would prepare and publicly post on their websites, order routing data, updated on a monthly basis, containing aggregated and anonymized broker-dealer order routing information. The required datasets, detailed in proposed Rule 610T(d), would contain order routing information for liquidity-providing orders and liquidity-taking orders aggregated by day, by security, by broker-dealer,

[348] As discussed in Section III.E.1, supra, the Commission would publish by notice the initial List of Pilot Securities, which would identify the securities in the proposed Pilot and assign each of them to a designated test group (or the control group).

and by exchange on an anonymous basis. The Commission expects that the equities exchanges would compile the required order routing data by utilizing the data they collect pursuant to the CAT.[349] As discussed below, each exchange would need to aggregate at the daily level the order routing statistics detailed in proposed Rule 610T(d) and would need to anonymize that data at the broker-dealer level, using the anonymization key provided by representatives of the Commission at the outset of the proposed Pilot. These data, in pipe-delimited ASCII format, would be publicly posted to each exchange's website, no later than the last day of each month for the prior month.

Although the proposed rule requires that exchanges release order routing data at the anonymized broker-dealer level, market participants or researchers theoretically could reverse engineer proprietary trading strategies of other market participants, which could have implications for the profitability of those strategies going forward if they were revealed or mimicked by other participants. The Commission is sensitive to the potential proprietary nature of the order routing data but preliminarily believes that releasing the order routing data would not affect market participants because the likelihood of being able to reverse engineer broker-dealers' order-level strategies is low because the data would be aggregated by security and day and would anonymize the broker-dealers. The proposal requires the order routing data to be anonymized at the broker-dealer level to limit the degree to which it reveals proprietary information. The order routing data are also aggregated by day, and released with a delay, to limit revealing individual strategies in the event someone was able to reverse engineer broker-

[349] See Section III.E.3 supra, which provides a more detailed discussion of the use of the CAT for the collection of order routing data.

dealer identities. The Commission provides estimates of the costs associated with complying with the proposed Transaction Fee Pilot's reporting requirements, discussed in detail below.

b. Updating the Pilot Securities Exchange List and Pilot Securities Change List

As described above, the exchanges would maintain and make public prior to the start of each trading day the Pilot Securities Exchange List of the securities included in each test or control group on its website, in accordance with Rule 610T(b), making relevant adjustments for ticker symbol changes and corporate actions (i.e., mergers or name changes). Further, each exchange would publicly post on its website the updated Pilot Securities Change List prior to the start of each trading day, which would list, separately, changes to applicable Pilot Securities. Additional details of what would be included in each list are provided in Section III.E.1.

From time to time, exchanges update issuers' ticker symbols for various reasons, such as a merger or a corporate reorganization and notify their members when such changes become effective. Given that every exchange has practices in place to update its members about the listed securities and has also adjusted its normal processes to account for the Tick Size Pilot, the Commission preliminarily believes that the costs associated with providing required data for the proposed Transaction Fee Pilot would not place undue cost burdens upon the exchanges. The processes used by exchanges to update the list of pilot securities for the Tick Size Pilot could be used to also track the proposed Transaction Fee Pilot securities, as well as any changes to those securities as detailed above in Section III.E.1.

Upon the initial publication of the List of Pilot Securities by notice by the Commission, the primary listing exchanges[350] would need to determine which securities are listed on their market, compile, and publicly post on their websites downloadable files in pipe-delimited ASCII format a list of those securities. The Commission preliminarily estimates that the costs associated with the initial compilation of the Pilot Securities Exchange List would cost $2,060 per exchange, or $10,300, in aggregate.[351]

The Commission understands that each primary listing exchange has existing systems to monitor and maintain the Pilot Securities Exchange List and the Pilot Securities Change List as a result of certain corporate actions.[352] While these systems can be used to collect the data required to be made public for the Pilot Securities Exchange List and the Pilot Securities Change

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350 The five primary listing exchanges are NYSE, Nasdaq, NYSE American, NYSE ARCA, and BATS.

351 This estimate is based on the following: [(Compliance Manager (4 hours) X $298)+(Programmer Analyst (4 hours) X $232)] = $2,060 per exchange, or $2,060 X 5 primary listing exchanges = $10,300 in aggregate. The burden hours are obtained from Section IV.J.1, supra. The Commission estimates the wage rate associated with these burden hours based on salary information for the securities industry compiled by the Securities Industry and Financial Markets Association (SIFMA). The estimated wage figure for attorneys, for example, is based on published rates for attorneys, modified to account for a 1,800- hour work-year and multiplied by 5.35 to account for bonuses, firm size, employee benefits, and overhead, yielding an effective hourly rate for 2013 of $380 for attorneys. See Securities Industry and Financial Markets Association, Management & Professional Earnings in the Securities Industry – 2013, available at: https://www.sifma.org/resources/research/management-and-professional-earnings-in-the-securities-industry-2013/. These estimates are adjusted for inflation based on Bureau of Labor Statistics data on CPI-U between January 2013 (230.280) and January 2017 (242.839). Therefore, the 2017 inflation-adjusted effective hourly wage rates for attorneys are estimated at $401 ($380 x 242.839 / 230.280). The Commission discusses other costs of compliance with the proposed rule below.

352 See supra note 150. As discussed above, primary listing exchanges have experience in producing and maintaining similar lists on their websites with respect to the Tick Size Pilot, which should be adaptable to meet the requirements of the proposed Transaction Fee Pilot.

List, the Commission further understands that these systems would have to be adapted to conform to the requirements of the proposed Pilot. The Commission estimates that it would cost each primary listing exchange approximately $3,720 to develop appropriate systems for the proposed Transaction Fee Pilot, or $18,600 in aggregate across the five U.S. primary listing exchanges.[353] Once these systems are established, the Commission estimates that it would cost each exchange $86,300 for the entire duration of the proposed Pilot, including up to the one-month pre-Pilot Period, a two-year Pilot duration, and the six-month post-Pilot Period, or $431,500 across the five primarily listing exchanges,[354] to publicly post on each exchange's website the Pilot Securities Exchange List and Pilot Securities Change List prior to the start of each trading day in pipe-delimited ASCII format. If the Commission determined that the proposed Pilot shall be automatically sunset at the end of the first year, the Commission estimates that the costs to each exchange would be $52,900 for the one-month pre-Pilot Period,

353 This estimate is based on the following: [(Attorney (4 hours) X $401)+(Compliance Manager (4 hours) X $298)+(Programmer Analyst (4 hours) X $232)] ≈ $3,720 per exchange, or $3,720 X 5 exchanges ≈ $18,600 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

354 If the proposed Pilot were to automatically sunset at the end of the first year, the total number of days that the exchanges would need to provide the Pilot Securities Exchange List and the Pilot Securities Change Lists would be up to 651 business days (up to 21 business days for the one-month pre-Pilot Period, 504 business days for the two-year Pilot horizon (252 business days per year X 2 years), and 126 business days for the six-month post-Pilot Period). The total number of days in the pre-Pilot Period would be no more than 21 trading days, but could be as short as zero days depending on when the exchanges begin to publish the Lists. The cost estimate for providing these lists for the entire period is based on the following: [(Compliance Manager (0.25 hour X 651 trading days) X $298)+(Programmer Analyst (0.25 hour X 651 trading days) X $232)] ≈ $86,300, or $86,300 X 5 exchanges ≈ $431,500, in aggregate. The burden hours are obtained from Section IV.J.1, supra.

a one-year Pilot duration, and the six-month post-Pilot Period, or $264,500 across the five primarily listing exchanges.[355]

c. Producing the Exchange Transaction Fee Summary in XML Format

In addition to the Pilot Securities Exchange List provided by the primarily listing exchanges, all U.S. equities exchanges would also need to publicly post on their websites the Exchange Transaction Fee Summary, downloadable files containing the initial set of fees at the outset of the proposed Transaction Fee Pilot as well as monthly updates to include both changes to fees and rebates reported in Form 19b-4 fee filings and realized average and median per share fees and rebates, as discussed in Section III.E.2. The Exchange Transaction Fee Summary would need to be updated promptly in response to any changes to its dataset following the beginning of each calendar month from the pre-Pilot Period through the post-Pilot Period. The exchanges would be required to provide information on any transaction-based fee changes, according to Rule 610T(e), that they make during the proposed Pilot, including the effective dates of fee revisions. The proposed rule also requires that each exchange calculates the realized monthly average and median per share fees and rebates, as discussed in more detail in Section III.E.2.

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355 If the proposed Pilot were to automatically sunset at the end of the first year, the total number of days that the exchanges would need to provide the Pilot Securities Exchange List and the Pilot Securities Change Lists would be up to 399 business days (up to 21 business days for the one-month pre-Pilot Period, 252 business days for the one-year Pilot horizon, and 126 business days for the six-month post-Pilot Period). The total number of days in the pre-Pilot Period would be no more than 21 trading days, but could be as short as zero days depending on when the exchanges begin to publish the Lists. The cost estimate for providing these Lists for the entire period is based on the following: [(Compliance Manager (0.25 hour X 399 trading days) X $298)+(Programmer Analyst (0.25 hour X 399 trading days) X $232)] ≈ $52,900, or $52,900 X 5 exchanges ≈ $264,500, in aggregate. The burden hours are obtained from Section IV.J.1, supra.

A requirement at the outset of the proposed Pilot is that exchanges would need to report their base and top-tier fees and rebates, which the Commission estimates would cost each exchange $1,130, or $14,700, in aggregate across the 13 U.S. equities exchanges.[356] The reported base and top-tier fees and rebates would be mandatory elements of the Exchange Transaction Fee Summary. Concurrent with the submission of the Form 19b-4 fee filings to the Commission at the outset of the proposed Transaction Fee Pilot, the exchanges would also be required to publicly post on their websites downloadable files containing the initial Exchange Transaction Fee Summary, using an XML schema to be published on the Commission's website. The Commission estimates that it would cost exchanges $530 each to post this summary dataset to their websites, or $6,900 in aggregate across the 13 U.S. equities exchanges, using an XML schema to be published on the Commission's website.[357]

The proposed rule would also require that exchanges compute the monthly average and median realized per share fees and rebates, as detailed in Section III.E.2. These data would provide the Commission and the public aggregated data on the actual per share levels of fees and rebates assessed in the prior month, which the Commission believes is critical for estimating the effects of fees and rebates on order routing decisions. The Commission preliminarily believes that the costs associated with computing these summary data on fees and rebates are likely to be larger than the costs associated with updating the Exchange Transaction Fee Summary, discussed

356 The estimate is based on the following: [(Compliance Manager (2 hours) X $298)+(Senior Business Analyst (2 hours) X $265)] ≈ $1,130, or $1,130 X 13 equities exchanges ≈ $14,700 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

357 This estimate is based on the following: [(Compliance Manager (1 hours) X $298)+(Programmer Analyst (1 hours) X $232)] = $530 per exchange, or $530 X 13 U.S. equities exchanges ≈ $6,900 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

in detail below, and would likely require new systems by the exchanges to track the average and median fees.

The Commission estimates that each exchange would have a one-time cost of $24,000, or $312,000 in aggregate across the 13 U.S. equities exchanges, associated with the development and implementation of systems tracking realized monthly average and median per share fees pursuant to the proposed rule.[358] The Commission further anticipates that it would cost an additional $12,000 annually, or $156,000, in aggregate, per year, to ensure that the system technology is up to date and remains in compliance with the proposed rule.[359]

Moreover, as discussed above, exchanges would be required to produce monthly updates to the Exchange Transaction Fee Summary to capture realized average and median per share fees as well as any revisions to fee schedules made by the exchanges, which would be reflected in changes to base or top-tier fees and rebates, detailed in Section III.E.2. The Commission estimates that each month it would cost each exchange $530 to update the dataset of summary fees to reflect the updates to historical realized average and median per share fees and changes to the base and top-tier fees. This would require each exchange to make a total of 36 updates to the Exchange Transaction Fee Summary from the pre-Pilot Period through the post-Pilot Period, if

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358 This estimate is based on the following, which reflects the Commission's experience with and burden estimates for SRO systems changes: [(Attorney (20 hours) X $401)+(Compliance Manager (20 hours) X $298)+(Programmer Analyst (20 hours) X $232)+(Senior Business Analyst (20 hours) X $265] ≈ $24,000 per exchange, or $24,000 X 13 exchanges ≈ $312,000 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

359 This estimate is based on the following, which reflects the Commission's experience with and burden estimates for SRO systems changes: [(Attorney (10 hours) X $401)+(Compliance Manager (10 hours) X $298)+(Programmer Analyst (10 hours) X $232)+(Senior Business Analyst (10 hours) X $265] ≈ $12,000 per exchange, or $12,000 X 13 exchanges ≈ $156,000 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

the Commission determined that the proposed Pilot should continue for up to a second year and not automatically sunset at the end of the first year.[360] Each exchange would have total costs of updates to the Exchange Transaction Fee Summary of approximately $19,100 per exchange, or $248,300 among the 13 exchanges over the pilot duration, including pre- and post-periods.[361] If the proposed Pilot were to automatically sunset at the end of the first year, without the Commission determining that an extension for up to an additional year was needed, this would decrease the total number of updates to the Exchange Transaction Fee Summary to 24.[362] Under an automatic sunset at the end of the first year, each exchange would have total costs of updates to the Exchange Transaction Fee Summary of approximately $12,700 per exchange, or $165,100 among the 13 exchanges over the pilot duration, including pre- and post-periods.[363] As detailed

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360 This estimate of updates to the Exchange Transaction Fee Summary is the aggregation of updates from the pre-Pilot Period (6), the two-year pilot period if the Commission determines that an extension of up to an additional year was needed (24), and the post-pilot period (6), for a total number of 36 updates.

361 This estimate is based on the following: [(Compliance Manager (1 hours) X $298)+(Programmer Analyst (1 hours) X $232)] = $530 per exchange, or $530 X 36 fee changes per exchange ≈ $19,100. The 36 fee changes for the exchange encompass six updates during the six-month pre-Pilot Period, 24 updates during the two-year Pilot Period, assuming that the Commission determines that the additional year is required, and six updates during the six-month post-Pilot Period. In aggregate, updates to the Exchange Transaction Fee Summary are estimated to cost $19,100 X 13 U.S. equities exchanges ≈ $248,300. The burden hours are obtained from Section IV.J.1, supra.

362 This estimate of updates to the Exchange Transaction Fee Summary is the aggregation of updates from the pre-Pilot Period (6), the one-year pilot period with an automatic sunset at the end of the first year (12), and the post-pilot period (6), for a total number of 24 updates.

363 This estimate is based on the following: [(Compliance Manager (1 hours) X $298)+(Programmer Analyst (1 hours) X $232)] = $530 per exchange, or $530 X 24 fee changes per exchange ≈ $12,700. The 24 fee changes for the exchange encompass six updates during the six-month pre-Pilot Period, 12 updates during the one-year Pilot Period, assuming that the Commission determines that the additional year is not required and the Pilot is automatically sunset at the end of the first year, and six updates during the six-month post-Pilot Period. In aggregate, updates to the Exchange Transaction Fee

above, the Commission preliminarily estimates that the costs associated with the monthly updates to the Exchange Transaction Fee Summary would be a small fraction of the costs associated with the initial allocation of fees required at the outset of the proposed Pilot.

As discussed in Section III, the proposal would require that the Exchange Transaction Fee Summary be published on the exchanges' websites using an XML schema to be published on the Commission's website. The Commission understands that there are varying costs associated with varying degrees of structuring. The Commission preliminarily believes that most of the exchanges already have experience applying the XML format to market data. For example, the exchanges and market participants regularly use the FIX protocol[364] and FpML[365] to exchange information on highly structured financial instruments and related market data.[366]

Summary are estimated to cost $12,700 X 13 U.S. equities exchanges ≈ $165,100. The burden hours are obtained from Section IV.J.1, supra.

364 The Financial Information eXchange (FIX) protocol is an electronic communications protocol that provides a non-proprietary, free and open XML standard for international real-time exchange of information related to the securities transactions and markets. See https://www.fixtrading.org/.

365 FpML (Financial products Markup Language) is an open source XML standard for electronic dealing and processing of OTC derivatives. It establishes the industry protocol for sharing information on, and dealing in, financial derivatives and structured products. See http://www.fpml.org/.

366 Most of the exchanges have at least some portion of their data available through XML formats. For instance, the NYSE Group of exchanges provides daily closing prices, among other data, in XML, Excel, and pipe-delimited ASCII, while the Nasdaq exchanges (Nasdaq, BX, and PHLX) and Cboe exchanges (Cboe BZX, Cboe BYX, Cboe EDGA, and Cboe EDGX), provide daily share volume data, among other data, in XML. Information on the use of XML by exchanges is available at www.nyse.com, www.nasdaqomx.com, www.cboe.com, for the NYSE, Nasdaq, and Cboe exchange groups, respectively, and was obtained from a staff review of information on publicly available exchange websites. The Commission was unable to obtain information from CHX or IEX on their use of XML from information available on their publicly available websites.

The Commission anticipates that implementation of the proposed Pilot's XML schema would draw upon exchange resources and experiences previously used to implement other supply chain information standards, like those discussed above, that were developed by industry consensus-based organizations. Costs generally associated with the implementation may include those for: identifying the data required by the proposed Pilot within the exchange source systems; mapping the relevant fields in the exchanges' data source systems to the Commission's proposed XML schema; implementing, testing and executing the validation rules; and developing the website posting processes as required by the proposed rule. The initial costs to exchanges of complying with the Commission's proposed XML schema in order to publicly post the Exchange Transaction Fee Summary in this format would be $500 per exchange, or $6,500 in aggregate across the 13 exchanges.[367] For all updates to the Exchange Transaction Fee Summary, the Commission estimates that any burden associated with making those available using the XML schema is included in the costs of the updates discussed above.

d. Producing the Order Routing Data

The proposed rule also would require as part of the proposed Transaction Fee Pilot that exchanges would prepare, in pipe-delimited ASCII format, and publicly post on their websites, order routing data, updated monthly, containing aggregated and anonymized broker-dealer order routing information. As discussed in proposed Rule 610T(d) and in Section III.E.3, the datasets

[367] This estimate is based on the following, which reflects the Commission's experience with and burden estimates for systems changes to map to an XML schema: [(Programmer Analyst (1 hours) X $232)+(Senior Business Analyst (1 hours) X $265] ≈ $500 per exchange, or $500 X 13 exchanges ≈ $6,500 in aggregate. See Securities Exchange Act Release No. 78309 (July 13, 2016), 81 FR 49431, 49475 (July 27, 2016) ("Disclosure of Order Handling Information"). The estimate is lower than that for proposed Rule 606 disclosures because the costs for those disclosures encompassed many additional requirements beyond the mapping to an XML schema.

would contain separate order routing data for liquidity-providing and liquidity-taking orders aggregated by day, by security, by anonymized broker-dealer, and by exchange, each month.

The Commission preliminarily believes that as long as the CAT Phase 1 data are available at the implementation of the proposed Transaction Fee Pilot, the exchanges would be able to use that data to construct the order routing data required by the proposed rule. In particular, the CAT Data will include records for every order received by an exchange that indicate the member routing the order to the exchange and details regarding the type of security. The CAT Data will also include other information necessary to create the order routing data such as order type information, special handling instructions, and execution information. In the event that the CAT Phase 1 data were not available, the exchanges would have to use existing systems to collect the required order routing data.[368] Regardless of which system exchanges use for the order routing data, the Commission anticipates they would incur costs in producing the downloadable files containing aggregated and anonymized monthly order routing data to be posted publicly on the exchanges' websites. The proposal would require that the exchanges adhere to using the common broker-dealer anonymization key provided by a representative of the Commission in order to track and analyze the activity of a given broker-dealer across multiple exchanges. As discussed in Section III.E.3, the Commission would construct a broker-

[368] The Commission acknowledged the use of CAT for future pilots in its Approval Order of the CAT NMS Plan. See note 172 supra. The Commission is aware that much of the data produced by the CAT are highly sensitive and if not properly anonymized and aggregated could reveal personally identifiable information (PII) at the investor level or proprietary trading strategies at the broker-dealer level. Accordingly, the exchanges would only make public as part of the Transaction Fee Pilot order routing data that are aggregated on a daily basis and anonymized of broker-dealers to minimize the potential for revelation or reverse engineering of proprietary order routing decisions.

dealer anonymization code, which would be an anonymized code common to a broker-dealer across all exchanges using CRD information.

The exchanges would also be required to make public the aggregated, anonymized order routing data described in Section III.E.3. The proposal requires that the exchanges would make public each month a dataset of aggregated, anonymized data on order routing statistics, detailed in proposed Rule 610T(d), by day, by issuer, and by broker-dealer. The Commission estimates that each exchange would have a one-time cost of $24,000, or $312,000 in aggregate across the 13 exchanges, associated with the development and implementation of systems needed to aggregate and anonymize the order routing information, as well as store the data, in the pipe-delimited ASCII format specified by the proposed rule and as detailed in proposed Rule 610T(d).[369] The Commission anticipates that it would cost each exchange an additional $12,000 per year, or $156,000 in aggregate per year, to ensure that the system and storage technology is up to date and remains in compliance with the proposed rule.[370]

The proposed rule would require that exchanges produce monthly updates of the order routing data, and make them publicly available on their websites in pipe-delimited ASCII format by the end of the month, as detailed in Section III.E.3 and proposed Rule 610T(d). The

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369 This estimate is based on the following, which reflects the Commission’s experience with and burden estimates for SRO systems changes: [(Attorney (20 hours) X $401)+(Compliance Manager (20 hours) X $298)+(Programmer Analyst (20 hours) X $232)+(Senior Business Analyst (20 hours) X $265] ≈ $24,000 per exchange, or $24,000 X 13 exchanges ≈ $312,000 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

370 This estimate is based on the following, which reflects the Commission’s experience with and burden estimates for SRO systems changes: [(Attorney (10 hours) X $401)+(Compliance Manager (10 hours) X $298)+(Programmer Analyst (10 hours) X $232)+(Senior Business Analyst (10 hours) X $265] ≈ $12,000 per exchange, or $11,960 X 13 exchanges ≈ $156,000 in aggregate. The burden hours are obtained from Section IV.J.1, supra.

Commission estimates that the publication and updates of the order routing dataset would cost $1,600 each month. This would require each exchange to make a total of 24 updates to the order routing data from the pre-Pilot Period through the post-Pilot Period, if the proposed Pilot were to automatically sunset at the end of the first year. Each exchange would have recurring costs of updates to the order routing data of approximately $57,600 per exchange, or $748,800 among the 13 exchanges over the entire duration of the Pilot, and the pre-Pilot and post-Pilot periods.[371] If the Commission were to allow the proposed Pilot to automatically sunset at the end of the first year, this would decrease the total number of monthly updates to the order routing data by 12 to 24.[372] Under the automatic sunset, each exchange would have recurring costs of updates to the order routing data of approximately $38,400 per exchange, or $499,200 among the 13 exchanges over a one-year Pilot, and the pre-Pilot and post-Pilot periods.[373]

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[371] This estimate is based on the following: [(Compliance Manager (3 hours) X $298)+(Programmer Analyst (3 hours) X $232)] ≈ $1,600 per exchange, or $1,600 X 36 fee changes per exchange ≈ $57,600. The burden hours are obtained from Section IV.J.1, supra. The 36 updates to the order routing data for each exchange encompass six updates during the six-month pre-Pilot Period, 24 updates during the two-year Pilot Period, assuming that the Commission determines at the end of the first year that it shall continue the proposed Pilot for up to an additional year, and six updates during the six-month post-pilot period. In aggregate, updates to the order routing data are estimated to cost $57,600 X 13 U.S. equities exchanges ≈ $748,800.

[372] This estimate of updates to the order routing data is the aggregation of updates from the pre-Pilot Period (6), the one-year Pilot Period assuming that the Commission allows the Pilot to automatically sunset at the end of the first year (12), and the post-Pilot Period (6), for a total number of 24 updates.

[373] This estimate is based on the following: [(Compliance Manager (3 hours) X $298)+(Programmer Analyst (3 hours) X $232)] ≈ $1,600 per exchange, or $1,600 X 24 fee changes per exchange ≈ $38,400. The burden hours are obtained from Section IV.J.1, supra. The 24 updates to the order routing data for each exchange encompass six updates during the six-month pre-Pilot Period, 12 updates during the first year of the Pilot Period, assuming that the Commission determines at the end of the first year that it shall automatically sunset the proposed Pilot, and six updates during the six-month post-pilot period. In aggregate, updates to the order routing data are estimated to cost $38,400 X 13 U.S. equities exchanges ≈ $499,200.

e. Fee-related Costs to Exchanges

At the outset of the proposed Pilot, each equities exchange would need to provide to the Commission a comprehensive Form 19b-4 fee filing reflecting all of the applicable fees and rebates relevant to each of the three Pilot Test Groups, as well as the Control Group—to reflect the temporary changes to transaction-based fees and rebates as a result of the proposed Pilot. The Commission anticipates considerable costs associated with and time devoted by each exchange to optimally assign fees and rebates across Test Groups, within the parameters allowed by the proposed Pilot, including any incentives, tiers, caps, and discounts available. The Commission estimates that it would cost $48,400 per-exchange for the initial Form 19b-4 fee filing or $629,200 in aggregate.[374] The Commission further anticipates that exchanges would bear similar costs upon the completion of the proposed Pilot to prepare Form 19b-4 fee filings for the Commission.

In addition to the initial production of the Form 19b-4 fee filing at the outset of the proposed Pilot, exchanges may also choose to make periodic updates to their fee and rebate schedules, and provide Form 19b-4 fee filings to notify the Commission and the public of those updates. As noted in the baseline, the average exchange makes approximately seven changes to its fee schedules per year. While recognizing the possibility that as a result of the proposed Pilot, exchanges may revise their fee schedules more or less often during the proposed Pilot, the

374 The estimate is based on the following: [(Attorney (40 hours) X $401)+(Compliance Attorney (40 hours) X $352)+(Assistant General Counsel (25 hours) X $449)+(Director of Compliance (15 hours) X $470)] ≈ $48,400, or $48,400 X 13 equities exchanges ≈ $629,200 in aggregate. See OMB Control No. 3235-0045 (August 19, 2016), 81 FR 57946 (August 24, 2016) ("Request to OMB for Extension of Rule 19b-4 and Form 19b-4 Filings").

Commission has no basis to expect an increase in the number of Form 19b-4 fee filings other than at the beginning or end of the proposed Pilot and has no basis to expect a decrease.

The Commission also recognizes that as an outcome of the proposed Pilot, the complexity of the Form 19b-4 fee filings could increase, thereby increasing the overall costs for exchanges to revise their fee and rebate schedules.[375] As discussed above, the proposed Pilot would require exchanges to design multiple new fee structures for each of the test groups, which would then translate into additional information in each Form 19b-4 fee filing submitted during the proposed Pilot. These costs are likely to increase because the exchanges could take considerably more time to design and describe fee structures in each filing than they do designing fee structures today. As discussed above in the baseline, the average fee schedules of exchanges are complex, with many different categories of fees or rebates assessed to NMS stocks (including ETPs). Assuming the frequency remains constant, then the proposed Pilot could increase the incremental costs incurred by exchanges to file the expected Form 19b-4 fee filings during the proposed Pilot.[376] The additional costs would only be relevant for Form 19b-4 fee filings that occur during the proposed Pilot Period, and would not apply to Form 19b-4 fee

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[375] The Commission preliminarily believes that the inclusion of Linked Pricing prohibitions for Test Group 3 should not increase the complexity of Form 19b-4 filings for exchanges because many exchanges already report non-cash incentives, such as tiered pricing or volume discounts, as part of their standard filings. Further, the Commission does not believe that exchanges currently use Linked Pricing mechanisms and instead most rely on rebates.

[376] Maintaining the current average frequency of 7 19b-4 filings per year would mean that the average exchange would file a total of 14 19b-4 filings during the two-year pilot (7 filings X 2 year duration). If the Commission were to allow the proposed Pilot to automatically sunset at the end of the first year, then the total number of 19b-4 filings could decrease by 7 filings. Annually, across all 13 exchanges, the Commission preliminarily estimates that there will be 91 19b-4 filings (7 filings X 13 exchanges). If the Commission determines that the proposed Pilot shall continue for a second year, in aggregate, the 13 exchanges could file a total of 182 19b-4 filings (91 X two-year Pilot duration).

filings in the pre-Pilot or post-Pilot Periods, as the Commission does not believe that there will be any incremental costs associated with increased complexity of these filings during these periods. The Commission estimates that each exchange would bear an incremental cost of $10,600 per Form 19b-4 fee filing to account for the increased complexity associated with the requirements of the proposed Pilot, or $1,930,000 for the anticipated 182 Form 19b-4 fee filings for fee and rebate revisions across the 13 U.S. equities exchanges during the two-year pilot duration.[377] If the proposed Pilot were to automatically sunset at the end of the first year, the Commission estimates that exchanges would bear costs of approximately $965,000 for the anticipated 91 Form 19b-4 filings for fee and rebate revisions across the 13 U.S. equities exchanges during the first year of the Pilot duration.

f. Other Costs Associated with the Proposed Transaction Fee Pilot

As discussed in further detail below, the Commission preliminarily believes that many of the other likely costs of this proposal would be temporary in nature and affect markets only for the duration of the proposed Pilot. For instance, more complicated fee structures could also increase an exchange's processing costs of tracking and calculating monthly invoices for its members during the proposed Pilot; however, the Commission does not have any information on the costs to exchanges for tracking and calculating monthly member invoices and therefore cannot provide estimates of quantified costs. The following section includes discussion of

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377 The estimate is based on the following: [(Attorney (8 hours) X $401)+(Compliance Attorney (8 hours) X $352)+(Assistant General Counsel (6 hours) X $449)+(Director of Compliance (4 hours) X $470)] ≈ $10,600, or $10,600 X182 fee changes in aggregate across 13 exchanges over the two-year pilot duration ≈ $1,930,000 in aggregate, assuming that the Commission determines that the proposed Pilot shall continue for up to an additional year. If the proposed Pilot were to automatically sunset after the first year, the Commission preliminarily believes that the costs associated with 91 19b-4 filings (13 exchanges X 7 filings) would be approximately $965,000 ($10,600 X 91 filings). See Request to OMB for Extension of Rule 19b-4 and Form 19b-4 Filings, supra note 374.

implementation costs for broker-dealers, the temporary effect on brokerage commissions, the effects to exchanges of liquidity externalities and complexity, and costs associated with the overlap with the Tick Size Pilot.

In addition to the compliance costs for exchanges associated with the implementation of the proposed Pilot, exchanges also may experience a change to their revenues associated with transaction-based fees and rebates. As discussed in the baseline, the exchange groups NYSE Group, Nasdaq, and BATS Global Markets, had net transaction-fee revenue of $223 million, $564 million, and $177 million, respectively, in 2016 as obtained from their Form 10-K or Form 10-Q filings. As discussed in more detail below, the margin between fees and rebates ranges from $0.0001 to $0.0005.[378] If the margin were $0.0005, exchanges could have no reduction in their overall net revenues (fees less rebates). If, instead, the margin is less than $0.0005, then exchanges could experience a decline in revenues attributable to securities in Test Group 2, if they continue to provide a nominal rebate to broker-dealers as an inducement to route orders to that exchange. Moreover, because Test Group 3 would prohibit rebates or Linked Pricing without changing the fee cap, exchanges would have incentives to charge higher fees than a competitive equilibrium would suggest, subsidizing any shortfall in revenues arising from Test Group 2. Competitive pressures arising from other market participants, including ATSs, could affect the success of any attempted revenue subsidization by exchanges through increased fees.

As noted above, the Commission preliminarily estimates that the only test group that could result in reduced revenues for exchanges is Test Group 2. Below, the Commission estimates a possible range of effects to the monthly revenues in aggregate across exchanges depending on the magnitude of the rebate that they could pay. Given that fees and rebates are

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378 See Section V.D.2 infra.

interconnected, the Commission preliminarily assumes that as fees are reduced as a requirement of the proposed Pilot, exchanges will similarly reduce rebates paid; therefore, the Commission preliminarily believes that exchanges are unlikely to pay rebates in excess of the maximum fee permitted in a given test group. The maximum per share revenue for Test Group 2 would then be $0.0005, with a minimum of $0.0000, depending on whether the exchange paid no rebate or a rebate of $0.0005, respectively, which would leave the exchange net revenue neutral before operating costs under the second scenario. Assuming that the share volume in Test Group 2 would be one-sixth of the total share volume across all securities,[379] using data from Table 3 in the baseline, Test Group 2 would have share volume of approximately 15.3 billion each month.[380] Under the scenario where exchanges paid no rebates in Test Group 2, the Commission preliminarily anticipates no change in revenue, assuming that the margin between fee revenue and rebate cost of $0.0005.[381] If, instead, exchanges paid rebates of $0.0005, where the net capture would be zero for Test Group 2, this would lead to a monthly aggregate shortfall in

[379] As designed, the proposed Pilot would allocate an equal number of securities to the three test groups and the control group (i.e., the test groups combined would have 50% of the NMS securities and the control group would have 50%). Each test group would have one-third of the combined test group allocation, thereby, in total leaving each test group with one-sixth of the securities included in the proposed Pilot. Assuming that the allocation of share volume would be similar due to the stratification of the sample discussed above, each test group would have one-sixth of total share volume each month.

[380] Table 3 in the baseline shows aggregate exchange share volume for July 2017 was 91.7 billion shares, of which one-sixth would be 15.3 billion shares. Further, the Commission preliminarily estimates that these volume figures would be similar across all months, assuming no seasonality in share volume.

[381] In addition, an exchange could have no change in net margin if its current margin is between $0.0005 and $0.0010 and the exchange charged for both taking and making liquidity. However, the effect of charging both sides on net revenues is unknown because charging both sides could change the nature of the exchange's order flow.

revenues across all exchanges of $7,650,000.[382] At the exchange level, Nasdaq, which has the largest monthly volume percentage (23%), would have a monthly shortfall of $1,760,000.[383] If exchanges are likely to have similar share volume each month, then the annual average shortfall across all exchanges would be $91.8 million. Compared to the margin between fee revenue and the cost of rebates for the publicly traded exchanges, detailed in the baseline, the annual revenue shortfall would be approximately 9.5%.[384] If the net capture on exchanges is less than $0.0005, on average, then exchanges could either maintain their current margin between fees and rebates (e.g., if the net capture is $0.0003, then exchanges could reduce rebates to $0.0002) or could increase the margin by reducing rebates even further (e.g., reduce rebates to $0.0001, and increase net capture to $0.0004).

Although the costs of compliance with the proposed Pilot primarily affect the exchanges, broker-dealers and other market participants are also likely to have implementation costs as a result of the proposed Pilot, if they decide to alter their behavior in response to the Pilot. For

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382 If Test Group 2 has monthly share volume of 15.3 billion shares, then the revenue shortfall is estimated to be 15.3 billion X $0.0005 ≈ $7,650,000.

383 As shown in Table 3, Nasdaq's July 2017 shares are 21.2 billion. Nasdaq's overall share is 21.2/91.7 ≈ 23%. The Commission estimates the monthly revenue shortfall for Nasdaq to be 0.23 X $7,650,000 ≈ $1,760,000.

384 In aggregate, the NYSE Group, Nasdaq, and BATS Global Markets earned a margin between fee revenues and costs of rebates of approximately $960 million in 2016. If the revenue shortfall was $92 million, then the percentage shortfall would be $92 million/$960 million ≈ 9.5%. However, this is likely to be too high since BATS Global Markets only reported financial statements for the first nine months of 2016. In the nine-months ending September 2016, BATS earned a margin between fee revenues and costs of rebates of approximately $177 million. Assuming that BATS earned revenues at a constant rate throughout the year, then the 12-month margin would have been $236 million ($177 million/9 months = $x million/12 months, x = $236 million). In that case, the aggregate margin would have increased from $960 million to $1.023 billion, which would have reduced the percentage shortfall from approximately 9.5% to 9.0% ($92 million/$1.023 billion).

instance, many broker-dealers have smart-order routing systems that use algorithms to route orders based on certain criteria, such as fill rates, time to execution, or highest rebates.[385] In response to the proposed Pilot, market participants that use smart-order routers could have a one-time cost at the onset (and the conclusion) of the Pilot to adjust their algorithms to reflect the shocks to transaction-based fees. In the absence of smart-order routers, market participants could still need to adjust the execution determinations to take advantage of the changes implemented during the proposed Pilot. The Commission preliminarily believes that the costs associated with updating the execution algorithms by broker-dealers are likely to be more costly than the periodic adjustments that broker-dealers may make to incorporate changes to fee schedules implemented by exchanges because they are likely to require more complex programming that segments stocks into different fee regimes, rather than just altering codes or inputs.

The Commission preliminarily believes that broker-dealers that are members of exchanges already have in place order routing systems, whether smart order routers or algorithmic trading programs that route orders to exchanges for which they are members. Therefore, the Commission does not expect that broker-dealers would need to bear start-up costs associated with implementing new order routing systems as a result of the proposed Pilot, and would only need to make modifications to the existing code to capture changes in fees and rebates associated with each test group of securities. The Commission estimates that the costs to broker-dealers that are members of exchanges to make the initial adjustment to their order routing systems at the outset of the proposed Pilot would be $8,700 per broker-dealer, or $3,741,000 in aggregate across the 430 broker-dealers that are currently members of equities

385 See Bacidore, Otero, and Vasa, supra note 235, which found that smart-order routers designed to maximize rebates delivered worse execution quality to their clients.

exchanges.[386] The Commission further estimates that broker-dealers would bear a similar cost to alter their order routing systems at the conclusion of the proposed Pilot.

As a result of the proposed Pilot, the Commission expects that broker-dealers would make adjustments to their order routing systems associated with changes to fees or rebates submitted by exchanges through Form 19b-4 fee filings to the Commission. As discussed in the baseline, exchanges, on average, make changes to fees or rebates approximately seven times per year; therefore, broker-dealers are likely to have experience in adjusting the order routing systems to reflect these routine changes to fees and rebates. Although broker-dealers have experience with revisions to exchange fee and rebate schedules, due to the added complexity of having to adjust and update multiple modules within their order routing systems, broker-dealers are likely to face higher costs per adjustment as a result of the proposed Pilot. The Commission preliminarily believes that the per-adjustment costs associated with these changes are likely to be a small fraction of the costs associated with the initial costs of updating the routing systems to reflect the required fee and rebate revisions at the outset of the proposed Pilot. The Commission estimates that the additional costs to broker-dealers that are members of exchanges to make periodic adjustments to their order routing systems to reflect changes in fees and rebates would be $265 per adjustment, or $114,000 in aggregate across the 430 broker-dealers that are members

[386] This estimate is based on the following, which reflects the Commission's experiences with and burden estimates for broker-dealer systems changes:[(Attorney (5 hours) X $401)+(Compliance Manager (10 hours) X $298)+(Programmer Analyst (10 hours) X $232)+(Senior Business Analyst (5 hours) X $265)] ≈ $8,700 per broker-dealer that is a member of at least one exchange. As of December 31, 2016, 430 unique broker-dealers were members of exchanges (Form X-17a-5). The aggregate costs of updating order routing systems to reflect the proposed Transaction Fee Pilot requirements would cost $8,700 X 430 ≈ $3,741,000.

of U.S. equities exchanges.[387] As shown above, the Commission preliminarily expects that exchanges, if submitting changes to fees and rebates at the same rate as they have in the last five years, would submit 182 total revisions to fees and rebates over the pilot duration, if the Pilot were to automatically sunset at the end of the first year. Therefore, the aggregate costs of updating order routing systems would be $48,200 per broker-dealer, or $20,726,000 in total across all broker-dealers.[388] If the Pilot were to automatically sunset at the end of the first year, the aggregate costs of updating order routing systems would be $24,100 per broker-dealer, or $10,363,000 in total across all broker-dealers. The Commission notes, however, that these estimates may be overstated, as not all broker-dealers are members of all exchanges, which would reduce the total number of changes to the order-routing systems that they would implement. Therefore, the Commission preliminarily believes that the costs to broker-dealers of adjusting their order routing systems as a results of the proposed Pilot are nominal, and each broker-dealer would spend on average approximately $67,000 to update their systems over the entire proposed Pilot Period.[389] If the Commission determined that the proposed Pilot shall

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387 This estimate is based on the following, which reflects the Commission's experiences with and burden estimates for broker-dealer systems changes:[(Compliance Manager (0.5 hours) X $298)+(Programmer Analyst (0.5 hours) X $232)] = $265 per broker-dealer that is a member of at least one exchange. The aggregate costs updating order routing systems to reflect the periodic fee and rebate revisions would cost $265 X 430 ≈ $114,000.

388 If 182 total fee and rebate changes were to occur over the duration of the proposed Pilot (13 equities exchanges X 7 revisions per year X 2 years = 182), each broker-dealer would bear costs of updating its order routing systems of $265 X 182 ≈ $48,200, or $20,726,000 ($48,200 X 430) in aggregate across all broker-dealers over the first year of the proposed Pilot. The Commission estimates that costs would be approximately $10,363,000 ($265 X 13 exchanges X 7 updates X 430 broker-dealers) if the Commission determined that proposed Pilot automatically sunset at the end of the first year.

389 These costs reflect the costs of approximately $9,000 at the outset of the proposed Pilot to update the order routing system to reflect the changes to the fee structure for securities in the test groups, approximately $49,000 to reflect the incremental costs of the estimated

automatically sunset at the end of the first year, then the costs associated with these updates would be approximately $42,900 per broker-dealer. Moreover, as noted above, this estimate assumes that broker-dealers are members of all 13 U.S. equities exchanges, whereas many are members of only a subset of exchanges, which would further reduce the costs of updating their order routing systems.

Exchanges and broker-dealers could also bear an increased cost of complexity associated with the exogenous shocks to the fees and rebates as required by the various test groups. As of July 2017, exchanges have 24 fee categories and 21 rebate categories, on average. If exchanges maintain the same level of complexity in their fee schedules during the proposed Pilot, up to a four-fold increase in the number of fee and rebate categories could occur, which would increase complexity for the exchanges, and would also increase complexity for broker-dealers who incorporate fees into their order routing decisions. Although the proposal would require exchanges to report a fee dataset as well as any changes to those fees, the exchanges may not simplify their actual fee schedules. For the duration of the proposed Pilot, however, the exchanges could resort to simplified fee schedules relative to the current baseline to reduce the costs of complying with the proposed Pilot.

Beyond the implementation and compliance costs for exchanges and broker-dealers associated with the proposed Transaction Fee Pilot, a number of temporary costs could be borne by investors as a result of the Pilot. The changes to the transaction-based fee structure could lead

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182 revisions to fee schedules during the proposed Pilot ($530 per revisions X 7 revisions per year X 2 years X 13 exchanges), and $9,000 at the conclusion of the proposed Pilot to unwind changes to the order routing systems, for a total of $67,000 per broker-dealer. If the proposed Pilot were to automatically sunset at the end of one year, then these costs would be approximately $42,900 ($530 X 7 revisions X 13 exchanges) per broker-dealer. <u>See</u> <u>supra</u> note 338 and the accompanying text.

to temporary, suboptimal outcomes for market participants, such as short-lived increases in brokerage commissions. It has been shown in several studies that brokerage commissions today are at historically low levels.[390] Brokerage clients seeking simplicity in their overall cost structure may have a preference for low commissions and increased services provided by broker-dealers, and in turn, may allow broker-dealers to capture rebates (and bear the costs of access fees), either through explicit contracts or implicit agreements.[391] As a result, the proposed Pilot could lead to higher overall commissions as rebates obtained by broker-dealers fall, thereby temporarily reducing the overall welfare of retail brokerage clients as a result of increased commissions.[392]

For instance, the elimination of rebates or Linked Pricing in Test Group 3 could result in a transfer from broker-dealers to exchanges. Assuming, as discussed above,[393] the margin between fees and rebates is $0.0002 per share, with access fees of $0.0030 per share and rebates of $0.0028 per share, Test Group 3 could result in a transfer of $0.0028 from broker-dealers to the exchanges, particularly because exchanges would be prohibited from offering Linked Pricing

390 See Angel, Harris, and Spatt, supra notes 106 and 216.

391 See supra note 37. See also O'Donoghue, supra note 24.

392 The Commission acknowledges differing effects on brokerage commissions could occur as a result of the proposed Pilot depending on whether the client is a retail customer versus an institutional customer. For instance, some brokerage accounts charge per-transaction commissions to retail clients (e.g., Fidelity charges $4.95 per trade, www.fidelity.com, while TD Ameritrade charges $6.95 per trade, www.tdameritrade.com). Institutional commissions, on the other hand, are highly negotiated and may be based on something other than a per trade or per share basis, such as a flat fee for use of a broker's order routing algorithm; however, data on the structure or magnitude of institutional commissions is not publicly available.

393 See supra note 28.

mechanisms that could act as substitutes for cash rebates.[394] Following this example, and using the same estimation procedure to calculate costs to exchanges attributable to the reduction in fees in Test Group 2, the estimates of the potential increased revenue to exchanges are as follows. Assuming that the share volume in Test Group 3 would be one-sixth of the total share volume across all securities,[395] using data from Table 3 in the baseline, Test Group 3 would have share volume of approximately 15.3 billion each month.[396] If the margin between fee revenue and rebate cost is $0.0002, as discussed above, then under the assumption that exchanges reduce fees to $0.0002 in Test Group 3, the Commission preliminarily anticipates no change in revenue for exchanges, and no transfer from broker-dealers. If, instead, exchanges charged fees of $0.0030 while prohibited from paying rebates or Linked Pricing in Test Group 3, the Commission preliminarily estimates a monthly aggregate increase in revenues across all exchanges of $42,840,000.[397] If exchanges are likely to have similar share volume each month, then the estimated annual average increase in revenues across all exchanges would be $514.1 million.

394 Although the Commission preliminarily believes that competition among exchanges would drive access fees down for Test Group 3 as a result of the elimination of rebates, exchanges could charge access fees as high as the current cap of $0.0030.

395 As designed, the Pilot would allocate an equal number of securities to the three test groups and the control group (i.e., the test groups combined would have 50% of the NMS securities and the control group would have 50%). Each test group would have one-third of the combined test group allocation, thereby, in total leaving each test group with one-sixth of the securities included in the pilot. Assuming that the allocation of share volume would be similar due to the stratification of the sample discussed above, each test group would have one-sixth of total share volume each month.

396 Table 3 in the baseline shows aggregate exchange share volume for July 2017 was 91.7 billion shares, of which one-sixth would be 15.3 billion shares. Further, the Commission preliminarily estimates that these volume figures would be similar across all months, assuming no seasonality in share volume.

397 If Test Group 3 has monthly share volume of 15.3 billion shares, and the margin would increase by $0.0028 ($0.0030 - $0.0002), the revenue increase per month is estimated to be 15.3 billion X $0.0028 ≈ $42,840,000.

This transfer of rebates from the broker-dealers to exchanges could feasibly increase exchange revenue by approximately 53.6%.[398] Moreover, these costs could likely fall to investors in the form of higher commissions or fees charged to cover the decrease in broker-dealer revenue due to losses in rebates for securities in Test Group 3.

The Commission further acknowledges that if brokerage commissions were to increase as a result of the proposed Pilot, broker-dealers could continue to charge higher commissions even after the conclusion of the proposed Pilot. However, due to competition among broker-dealers, including the proliferation of low-cost online broker-dealers, the Commission preliminarily believes that broker-dealers would be unlikely to significantly increase brokerage commissions as a result of the proposed Pilot.[399]

As a result of the proposed Pilot, effective bid-ask spreads could temporarily widen for securities in certain test groups due to the elimination or reduction of rebates. According to one study, transaction-based rebates could serve to artificially lower the NBBO, which could lower the trading costs to investors.[400] This reasoning suggests that wider effective bid-ask spreads

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[398] In aggregate, the NYSE Group, Nasdaq, and BATS Global Markets earned a margin between fee revenues and costs of rebates of approximately $960 million in 2016. If the estimated margin increased by $514.1 million, then the percentage increase in this margin would be $514.1 million/$960 million ≈ 53.6%. However, this is likely to be too high since BATS Global Markets only reported financial statements for the first nine months of 2016. In the nine-months ending September 2016, BATS earned a margin between fee revenues and costs of rebates of approximately $177 million. Assuming that BATS earned revenues at a constant rate throughout the year, then the 12-month margin would have been $236 million ($177 million/9 months = $x million/12 months, x = $236 million). In that case, the aggregate margin would have increased from $960 million to $1.023 billion, which would have reduced the percentage increase from approximately 53.6% to 50.3% ($514.1 million/$1.023 billion).

[399] See Section V.B.2.a supra, which discusses the competitive environment for broker-dealer services.

[400] See Angel, Harris, and Spatt, supra note 106.

could temporarily increase transactions costs for internalized order flow or orders routed to ATSs that execute based on the NBBO, which would predominantly impact retail investors, as well as for orders executing on exchanges. However, any potential degradation of the effective bid-ask spread due to lower or reduced rebates could be mitigated by lower access fees.

The reduction or elimination of rebates could also particularly affect smaller exchanges due to the liquidity externality. As liquidity tends to consolidate for reasons discussed in Section V.A.2, the restrictions on rebates as a result of the proposed Pilot could harm smaller exchanges that perhaps compete by paying large rebates rather than by producing better prices or execution quality. In the short run, this could lead to lost revenue for these exchanges, and potentially could have longer-term effects if smaller exchanges consolidate or exit as a result of the proposed Pilot. As discussed above, using available data, the Commission estimates that aggregate revenue shortfalls for exchanges are likely to range between zero and $92 million annually.[401]

Markets may also temporarily become even more complex as a result of the proposed Pilot. Exchanges could promote additional order types and may even initiate new types of markets as a result of the proposed Pilot, which would only serve to further fragment markets and add to their complexity, the costs of which could be borne by investors. The Commission preliminarily believes, however, that a new exchange registered in response to the Pilot would be unlikely to become operational before the conclusion of the proposed Pilot.

Simultaneously subjecting a subset of NMS securities to both the Tick Size Pilot and the proposed Transaction Fee Pilot could increase potential costs to issuers, particularly for small-

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[401] See Section V.C.2.a supra, for the estimates of revenue shortfalls that could occur as a result of the proposed Pilot.

capitalization issuers, to the extent that any overlap between the pilots could occur. Small issuers that could be subject to both pilots are most likely to face adverse liquidity environments, and therefore, are most likely to have ramifications to their liquidity, such as larger spreads, as a result of the simultaneity of the pilots. Longer term, , if the temporary impacts on liquidity acutely affect some firms, it could affect capital formation for these securities and could lead to the potential exit of these issuers from the capital markets, through acquisition or delisting, as these small issuers are least likely to be able to ride out negative liquidity shocks. Instead, the proposed Pilot could lead some issuers to delay entering the capital markets for the duration of the proposed Pilot.[402]

Separately, the implementation costs to exchanges associated with running two pilots on subsets of the same securities could have significant costs related to the complexity of multiple pilots, to the extent that the pilots could overlap. Although the exchanges already have operational experience with implementing the Tick Size Pilot, the costs of implementation provided above could be underestimated because of the complexity of tracking the same issuers within multiple pilots. For instance, the Commission preliminarily estimates that it will cost $3,720 per exchange to construct its initial Pilot Securities Exchange List, and $33,400 annually to update this list daily. Because exchanges may have to identify securities that are in both the Transaction Fee Pilot and the Tick Size Pilot for some period of time, the costs of producing the Pilot Securities Exchange List could exceed these values.[403] The Commission, therefore,

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402 If rebates are associated with increased liquidity, particularly for small issuers, then prohibitions on rebates or Linked Pricing could adversely affect those firms. However, the Commission preliminarily believes that exempting registered market makers from the prohibition on non-rebate incentives could lessen the impact to liquidity for small issuers.

403 See supra note 353.

preliminarily believes that any excess costs are likely to be proportional to the duration of the overlap between the Tick Size Pilot and the proposed Transaction Fee Pilot.[404]

D. Impact on Efficiency, Competition, and Capital Formation

Exchange Act Section 3(f) requires the Commission when engaging in rulemaking to consider or determine whether an action is necessary or appropriate in the public interest, and to consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation.[405] As discussed in further detail below, the Commission preliminarily believes that any of the direct effects of this proposal on efficiency, competition and capital formation would likely be temporary in nature and affect markets only for the duration of the proposed Pilot. The Commission preliminarily believes that the information obtained as a result of the proposed Transaction Fee Pilot could improve regulatory efficiency, because analyses of this data are likely to provide a more representative view of the effect of transaction-based fees on order routing decisions than would be available to the Commission in the absence of the proposed Pilot. Further, the proposed Pilot may have a number of temporary effects on price efficiency, the competitive dynamics between exchanges and off-exchange trading venues in the market for trading services, and on capital formation, particularly for small issuers.

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404 If such overlap occurred, and was limited to the pre-Pilot data collection period for the proposed Transaction Fee Pilot, the additional costs related to implementation, complexity, and uncertainty could be minimal because the two pilots would not operate simultaneously. As discussed in Section V.C.1.a.i.A, supra, the Commission preliminarily believes that any overlap could be minimal. See also supra note 342 for a discussion of the potential statistical power of testing the joint effects of the two pilots simultaneously. The Commission is cognizant that a longer overlap could be costly to market participants.

405 See 15 U.S.C. 78c(f).

As discussed above, a primary benefit of the proposed Pilot is that it would produce data that will be relevant for the Commission's consideration of the economic effects of transaction-based fees. The data obtained from the proposed Transaction Fee Pilot would provide information not currently available to the Commission about the role of transaction-based fees in the market for trading services and how that affects competition between exchanges and with off-exchange trading centers.

1. Efficiency

The proposed Transaction Fee Pilot would provide the Commission with an opportunity to empirically examine the effects of an exogenous shock to transaction fees and rebates order routing behavior, execution quality and market quality. Insofar as the data produced by the proposed Pilot permits the Commission and the public to evaluate and comment upon the potential impacts of alternative policy options, the proposal may promote regulatory efficiency. In the absence of the proposed Pilot, the Commission would have to rely on currently-available data to inform future policy decisions related to transaction-based fees and data limitations may impair the efficiency of policy decisions based on this information.

The temporary efficiency impacts the Commission expects during the proposed Pilot depend on how the proposed Pilot fee and rebate restrictions proposed for the three test groups balance the interests of different groups of market participants. For example, if during the Pilot, the lower fee caps and no-rebate restriction induced by the proposed Pilot cause broker-dealers to be more likely to route customer orders to trading centers with better pricing, higher speed of execution, or higher probability of execution, rather than to trading centers with the largest rebates, the proposed Pilot may temporarily improve the efficiency of capital allocation by lowering execution costs. Efficiency of capital allocation could be reduced if, as a response to the loss in revenue from rebates, broker-dealers increase commissions or fees charged to customers. Higher commissions or fees could reduce customers' willingness to trade or could lead to a lower injection of capital into the markets by investors because a larger fraction of each investable dollar would go to compensate broker-dealers for the lost revenue. However, because rebates are generally accompanied by higher access fees, the overall costs to broker-dealers to route orders to exchanges could decline for some test groups, which could lead to a decrease in commissions or fees and temporarily increase the efficiency of capital allocation.

For the duration of the proposed Transaction Fee Pilot, lower access fees could improve liquidity of stocks and ETPs in some test groups, by reducing the costs to execute marketable orders. As marketable orders become less costly, these orders are likely to be routed to exchanges with lower access fees, improving execution quality and possibly creating a liquidity externality, whereby lower access fee venues will become the preferred trading center for marketable and non-marketable orders.[406] An increase in liquidity could improve informational efficiency by allowing securities prices to adjust more quickly to changes in fundamentals.

As a result of the proposed Pilot, price efficiency might also improve; quoted spreads also may more closely reflect the net cost of trading and could temporarily increase price transparency for securities in certain test groups. Currently, broker-dealers do not relay information about amounts of fees paid or rebates received on trades to their customers, thereby limiting the transparency of the total costs incurred to execute a trade. The proposed Pilot would not mandate disclosure by the exchanges or the broker-dealers of order-level transaction-based fees; and therefore, will not resolve the limitations to transparency of the total fees paid and

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406 As discussed in detail above, improvements in execution quality could present as better prices for execution, higher probability of execution, and faster time to execution. See supra note 215.

rebates received by broker-dealers discussed above. As fees decline or rebates are removed in some test groups, however, the deviation in the net cost of trading from the quoted spread could shrink, thereby at least partially improving price transparency for the duration of the proposed Pilot, and temporarily improving pricing efficiency and price discovery. Therefore, as an additional benefit of the proposed Pilot, the Commission could also examine the temporary effect of revisions to access fees and rebates on quoted spreads, to better inform future policy recommendations of the effects of transaction-based fees on price efficiency.[407]

Other aspects of the proposed Pilot temporarily may impair efficiency. The proposed Pilot is intended to reduce (and in some cases eliminate) rebates or Linked Pricing for a substantial portion of NMS stocks (including ETPs); however, the loss of rebates or Linked Pricing in Test Group 3 could have a differential effect between large and small capitalization securities.[408] If exchanges use rebates as a mechanism to provide broker-dealers with incentives to post non-marketable orders to exchanges, in the absence of rebates, broker-dealers instead may have incentives to post these orders to off-exchange trading centers, such as ATSs. This may lead to a temporary widening of the NBBO, which could lead to a temporary reduction of liquidity that could be particularly severe for small or mid-cap securities. Thus, the overall informational efficiency of prices, as a result of widening spreads, could temporarily decline with the implementation of the proposed Pilot.

Furthermore, even if broker-dealers do not use ATSs and internalization more intensively, the proposed Pilot may temporarily impair the efficiency of transactions in certain Test Groups, through the impact of Pilot-induced fee and rebate changes on the NBBO. As

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[407] See Section V.C.2.b supra.

[408] See supra note 402.

discussed earlier, one potentially distortive effect of transaction-based fees on maker-taker trading centers is that they provide incentives for market participants to post more aggressive limit orders (e.g., limit orders close to the current market price) because they anticipate receiving rebates if their orders are executed. To the extent that reductions in rebates result in a wider bid-ask spread in certain stocks and ETPs during the proposed Pilot Period, this may increase transaction costs for internalized order flow or orders routed to ATSs that execute based on the NBBO and for orders executing on exchanges.[409] For example, if an ATS offers to execute buy orders at the average of the national best offer and midpoint, rather than at the wider quoted spread, the ATS would execute these orders at higher prices than those available on exchanges. Notably, the impact of less aggressive limit orders is less likely to affect marketable orders on maker-taker trading centers, because lower taker fees could mitigate the impact of a wider quoted spread on total transaction costs for liquidity takers.

Finally, the Commission acknowledges that the fee caps and prohibition on rebates or Linked Pricing imposed on the test groups during the proposed Pilot further constrain the exchanges' abilities to strategically choose fee and rebate schedules and for some NMS stocks may restrict the fees and rebates further beyond the current levels, which could be efficient from the exchanges' perspective, incorporating their beliefs about the trade-off between revenues and costs associated with these transaction-based fees. The proposal could temporarily result in more or less efficient fee and rebate schedules because the exchanges might not be able to optimize their pricing structure for some test groups of securities. While the Commission does not currently have information to determine the current level of efficiency of fees and rebates, the information that the Commission and the public receive from the proposed Pilot could enable the

409 See Angel, Harris, and Spatt, supra note 106.

analysis of market impacts stemming from changes to fees, potentially permitting the Commission to assess alternative requirements for transaction-based fees that may be more efficient.

2. Competition

While the Commission preliminarily believes that most of the impacts of the proposed Pilot on the market for trading services would be limited to the duration of the proposed Pilot, some effects may last beyond the end of the proposed Pilot. Certain exchanges could be harmed if a reduction in rebates results in consolidation of orders at other exchanges. This could occur if the proposed Pilot attenuates the potentially distortive impact of transaction-based fees and causes broker-dealers to route orders to trading centers they perceive as more liquid. To the extent that increased order flow in a security directed to a particular venue encourages broker-dealers to route more orders for that security to the venue, a liquidity externality may develop, making the venue the preferred routing destination for all orders. Although these effects would likely last only for the duration of the proposed Pilot, depending on the extent of the liquidity externalities, smaller exchanges could experience long-lasting competitive effects. The proposed Transaction Fee Pilot could also temporarily discourage entry of new exchanges that might otherwise emerge to take advantage of the maker-taker and taker-maker pricing models.[410] Under such circumstances, while the consolidation of liquidity may benefit market participants, it may also make it difficult for trading centers with low volumes in particular securities to compete with trading centers that represent liquidity centers in these securities. This could lead to consolidation or exit by small exchanges as a result of the proposed Pilot, although the

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410 Academic studies suggest a number of new exchanges emerged specifically to take advantage of maker-taker and taker-maker pricing models. See, e.g., Angel, Harris, and Spatt, supra note 106.

Commission preliminarily believes that either of those events is unlikely because the anticipated revenue shortfall, as discussed above, would be for a limited duration and would not be significant enough to cause this result.

The proposed Transaction Fee Pilot may also temporarily alter competition among exchanges that use transaction-based fee pricing models. Exchanges that pay fees and remit rebates frequently revise their fee schedules in order to remain competitive and to attract order flow. The impact of the proposal on competition depends on the extent to which the fee caps and prohibition on rebates or Linked Pricing restrict exchanges' transaction-based fee strategies. On one hand, the proposed Pilot, while changing either access fees or rebates on certain subsets of securities, could leave the margins that exchanges obtain from transaction-based pricing models unchanged and could preserve the current state of competition among exchanges in the market for those securities. Several earlier studies suggest that the average difference between the access fees and rebates is approximately \$0.0005; however, the EMSAC NMS Subcommittee observed that the current typical margin per share is \$0.0002,[411] and a recent report from 2017 suggests that the spread between fees and rebates is approximately \$0.0001.[412] For instance, for stocks in Test Group 1, which limits access fees to no greater than \$0.0015, it may be possible for exchanges to modify fee structures in a way that leaves margins unchanged and does not

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411 See supra note 28.

412 See, e.g., Laura Cardella, Jia Hao, and Ivalina Kalcheva, "Make and Take Fees in the U.S. Equity Market," Working Paper, University of Arizona (2015), available at: https://www.rhsmith.umd.edu/files/Documents/Centers/CFP/research/cardella_hao_kalcheva.pdf ("Cardella, et al. study"); Harris, supra note 23. Each of these papers indicates the difference between fees and rebates is approximately \$0.0005 per share; the Cardella et al. study, however, uses data from 2008 to 2010. A recent discussion indicates that the difference between fees and rebates is \$0.0001. See, e.g., "How to Align Broker and Customer Interests to Make Exchanges More Competitive," Trillium Management, LLC (June 28, 2017), available at: https://www.trlm.com/align-broker-customer-interests-make-exchanges-competitive/.

impact competition between exchanges. However, this may not be true for all test groups, and some exchanges may be unable to maintain current average margins per share for stocks in Test Group 2.[413] These exchanges may choose to compete less intensively for order flow in this test group, instead focusing on stocks and ETPs in other test groups. Some of the shortfall in the competition for order flow for this subset of securities could be filled by off-exchange trading centers. Alternatively, exchanges may revise pricing strategies for stocks in other groups, choosing to implicitly subsidize rebates for stocks in some test groups using fees from stocks in other test groups. This may increase competition for order flow in some test groups while reducing it in others. In the presence of tighter restrictions on transaction-based fees during the proposed Pilot Period, exchanges could compete in other ways to attract trading volume (e.g., discounts on connectivity fees or increased volume discounts), although the Commission believes that for some test groups the ability to offer meaningful volume discounts would be limited.[414]

The proposed Transaction Fee Pilot may not only affect competition between exchanges, but also could affect broker-dealers' decisions to route orders to off-exchange trading centers for the duration of the proposed Pilot, affecting how exchanges compete with other execution venues in the market for trading services. Lower rebates during the proposed Pilot Period may prompt broker-dealers to internalize a higher proportion of order flow or route a higher proportion of order flow to wholesalers and ATSs. This could alter the current competitive dynamics among

413 As discussed in Section III.C.2, if the margin between fees and rebates exceeds $0.0005, exchanges theoretically could assess fees to both the make and take sides of the market; however, the Commission preliminarily believes that exchanges are unlikely to do so.

414 For NMS stocks included in Test Group 3, order flow incentives would be substantially reduced, particularly any new inducements that provide a discount or incentive on one side of the market that is linked to activity on the opposite side of the market.

trading centers in favor of non-exchange trading centers. Lower access fees, on the other hand, could attract marketable order flow from the ATSs and back to the exchanges, which could tilt the competitive equilibrium in favor of the national securities exchanges.

The proposed Pilot could also temporarily affect the competition for order flow for ATSs and could subsequently alter their market share. As discussed in the baseline, the market share of trading volume on ATSs is approximately 13%. If the prohibition of rebates or Linked Pricing in Test Group 3 leads to increased order flow migrating to off-exchange trading centers, this may increase the fraction of transaction volume to ATSs or other off-exchange venues traditionally captured by exchanges. The reduction in access fees in some of the test groups, however, could lead to exchanges attracting more order flow away from ATSs and other off-exchange trading centers. Similarly, if the equilibrium access fee in Test Group 3 is below $0.0030 in the absence of rebates, exchanges may be able to draw order flow from off-exchange trading centers.

The Commission recognizes that the potential temporary competitive impacts stemming from the proposed Pilot would generally depend on the exposure of each trading center to each test group and the control group of NMS stocks, because the constraints on fees and rebates apply differently to each group. For instance, if a high portion of an exchange's volume was derived from stocks in Test Group 2, it may be at a particular competitive disadvantage relative to an exchange that served markets across all groups, because a substantial reduction in the fee cap applicable to Test Group 2 would apply to a higher proportion of its trading volume. However, the Commission preliminarily believes that, given its aim of producing representative groups of stocks and ETPs for the purposes of the proposed Pilot, trading centers are not likely to be substantially more exposed to NMS stocks in any one group.

3. Capital Formation

The Commission preliminarily does not expect the proposed Pilot to have a substantial permanent impact on capital formation because the proposed Pilot is limited in duration, though many of the implementation costs associated with the proposed Pilot would require exchanges to expend resources related to maintaining the List of Pilot Securities and any changes to that lists, as well as the maintenance of the Exchange Transaction Fee Summary and the order routing data, they may have otherwise invested elsewhere or distributed to shareholders.[415]

As discussed above,[416] the Commission recognizes that the overall temporary impact of the proposed Transaction Fee Pilot on liquidity and total transaction costs could be positive or negative. As a result, the impact of the proposed Pilot on capital formation is uncertain. On one hand, the proposed Pilot could temporarily reduce total transaction costs for many market participants by consolidating liquidity and improving execution quality. To the extent that such cost reductions are realized, they may, for instance, permit market participants to more efficiently deploy financial resources by reducing the cost of hedging financial risks. As a result, the proposed Pilot may marginally and temporarily promote capital formation. Improvements in both liquidity and price efficiency could make capital markets more attractive, at least for the duration of the proposed Pilot. The temporary reduction in rebates to certain test groups as a result of the implementation of the proposed Pilot could widen quoted spreads, thereby potentially leading to worse execution prices and subsequently reducing liquidity for the duration

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[415] The costs associated with implementation and compliance with the proposed Transaction Fee Pilot are discussed in more detail above (Section V.C.2.a, supra).

[416] Section V.C.1.a.ii, supra, provides a discussion of price transparency, which could improve liquidity and total transaction costs, while the liquidity externality is discussed in Section V.A.2, supra.

of the proposed Pilot.[417] This would have similar indirect impacts on capital formation but in the opposite direction, by increasing the cost of hedging financial risks.

The proposed Pilot may also affect capital formation through its impact on discretionary accounts. A number of broker-dealers have discretionary agreements with their clients, wherein the broker can transact in the client's account without the client's consent. For the duration of the proposed Transaction Fee Pilot, some broker-dealers may alter the composition of their clients' portfolios to trade and hold greater proportions of the accounts in high-rebate NMS stocks (including ETPs) in the Control Group and Test Group 1. Such revisions to portfolio composition as a result of the proposed Pilot are not necessarily efficient from an investor's perspective and could have a detrimental impact on capital formation insofar as they increase the riskiness of client portfolios or decrease client portfolios' expected returns.[418] This behavior would temporarily distort the market for high-rebate stocks and ETPs, creating a higher demand for these securities and potentially leading to an inefficient allocation of capital based on signals that are unrelated to firm fundamentals.

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[417] See, George Chacko, Jakub Jurek, and Erik Stafford, "The Price of Immediacy," Journal of Finance 63, 1253-1290 (2008), available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.2008.01357.x/full ("Chacko et al."). According to Chacko et al., liquidity has three important dimensions: price, quantity, and immediacy. A market for a security is considered "liquid" if an investor can quickly execute a significant quantity at a price at or near fundamental value.

[418] Allocative efficiency in the context of investment choice is optimized when there are no restrictions on the set of investment opportunities available to an investor. See, e.g., Niels Christian Nielsen, "The Investment Decision of the Firm under Uncertainty and the Allocative Efficiency of Capital Markets," Journal of Finance 31, 587-602 (1976), available at: https://www.jstor.org/stable/2326628. If the proposed Pilot potentially leads some broker-dealers to alter the investment opportunity set to avoid securities that do not pay rebates, then allocative efficiency for those investors would likely be impaired since the opportunity set is restricted.

As discussed above, the proposed Pilot could lead to a temporary reduction of liquidity that could be particularly severe for small or mid-capitalization securities.[419] In addition to reducing the informational efficiency of prices, if the effects of the proposed Pilot are severe enough, longer term, it could affect capital formation for these securities. If the temporary impacts on liquidity acutely impact some firms, it could lead to either the potential exit of these issuers from the capital markets, through acquisition or delisting, as these small issuers are those least likely to ride out negative liquidity shocks. Further, the proposed Pilot could lead to a delay by some issuers to enter the capital markets during the proposed Pilot's duration.

E. Alternatives

Below, the Commission discusses a number of alternatives to the proposed Transaction Fee Pilot. As explained above, the proposed Pilot is designed to collect data on how changes to fees and rebates affect order routing behavior and execution, which could inform the Commission and the public as to any possible conflicts of interest between broker-dealers and their customers. The Commission considers four sets of alternatives: (1) expansion of the proposed Pilot to include ATSs; (2) inclusion of a trade-at provision; (3) prohibition of overlap with the Tick Size Pilot; and (4) adjustments to the basic pilot structure (e.g., the inclusion of a zero access fee test group). Where appropriate, suggestions attributable to the EMSAC recommendation have been identified within the scope of the alternatives presented below.[420]

1. Expand Proposed Transaction Fee Pilot to Include ATSs

As proposed, the Transaction Fee Pilot would not require ATSs to comply with the requirements on the limits to access fees or rebates imposed by the Pilot. One alternative would

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[419] See supra note 402.

[420] See supra note 37.

be the inclusion of ATSs in the proposed Transaction Fee Pilot proposal. Including ATSs in the proposed Transaction Fee Pilot would increase availability of data for an important segment of trading activity in the NMS securities, would cover a larger portion of the order routing inducements,[421] and could enhance the information regarding possible conflicts of interest available to the Commission. ATSs capture a large fraction of transaction volume for NMS stocks (approximately 13% as of July 2017), indicating that they are important competitors to exchanges and other off-exchange trading centers.[422] Some studies have noted that transaction-based fees and rebates have likely caused some order flow to migrate from exchanges to off-exchange trading centers, such as ATSs, in order to avoid high access fees levied by some exchanges.[423]

An alternative that includes ATSs would be broader than the proposed Pilot and would also include more inducements, besides fees and rebates, that broker-dealers might receive for routing orders to particular trading centers, including ATSs.[424] The Commission has limited information about how ATS fee structures might induce broker-dealers to route orders to ATSs thereby creating potential conflicts of interest between broker-dealers and their clients. If it included trading centers beyond exchanges, the proposed Pilot would provide information to the Commission and the public about a more complete set of order routing decisions by broker-dealers because it would increase the representativeness of the results obtained, and may provide a deeper understanding of how exogenous shocks to fees and rebates affect order routing

[421] See supra note 268.

[422] See supra note 298.

[423] See Angel, Harris, and Spatt, supra note 216.

[424] As discussed above, the proposed rule only prohibits new inducements that provide a discount or incentive on one side of the market that is linked to activity on the opposite side of the market for Test Group 3.

decisions. Further, because transaction-based fees and rebates are one possible method that exchanges and ATSs use as inducements for order flow, a pilot that was inclusive of these other inducements would further expand our understanding of what drives order routing decisions and might raise possible conflicts of interest.

The Commission preliminarily believes that the inclusion of ATSs and other inducements for order flow into the proposed Transaction Fee Pilot is likely to substantially increase the costs relative to the current proposal and may not be practical. Because broker-dealers that operate ATSs could bundle fees for ATS usage with other broker-dealer fees, the proposal might not practically be able to impose an access fee cap or prohibition on rebates on ATS fees. Further, the Commission currently does not require that ATSs provide periodic public disclosures on their fees, as it does with national securities exchanges, and these fees do not need to be filed with or approved by the Commission. Unlike exchanges, which must report their fees schedules publicly on their websites, and must file Form 19b-4 with the Commission to effect any changes to those fee schedules, ATSs currently have no reporting requirements for their fees. The costs to ATSs of participating in the Pilot would be higher relative to the costs to the exchanges in two ways: (1) the Pilot would require ATSs to report information that is currently not required by regulation for the purpose of the proposed Pilot, and (2) the Pilot would impose significant start-up costs on the ATSs to set up systems to report these fees. Thus, including ATSs in an alternative version of the proposed Pilot would likely increase both the costs and the complexity of the proposed Pilot because it would likely require a shift in the disclosure regime for these trading centers.

Even in the absence of including ATSs in the proposed Pilot, the Commission would be able to obtain information on the proportion of trades going to ATSs from several sources. First, several transaction datasets, including trade reporting facility (TRF) data and TAQ data, provide information on off-exchange trades, including ATS trades. Further, FINRA produces periodic (weekly) data on the total shares of NMS securities executed by individual ATSs.[425] Thus, the Commission would obtain information from the proposed Pilot to identify whether exogenous shocks to transaction-based fees on exchanges have an effect on order routing decisions, including whether broker-dealers alter their routing of order to ATSs during the proposed Pilot. The inclusion of ATSs into the requirements of the proposed Pilot, however, would likely significantly add to the proposed Pilot's complexity and cost a significant amount of money to implement.

2. Trade-At Test Group

The proposed Transaction Fee Pilot could include a "trade-at" provision in conjunction with the changes to the fees and rebates currently proposed in the Pilot.[426] The trade-at provision would require that orders be routed to a market with the best displayed price or are executed at a materially improved price. A trade-at provision could increase incentives to display prices, as off-exchange trading centers would no longer be able to match the best price offered elsewhere, but instead would have to provide significant price improvement or start displaying their quotes at the NBBO. Including the trade-at provision as a component of the proposed Transaction Fee Pilot could potentially increase the level of displayed liquidity across all venues, because off-

[425] Combining the FINRA volume data executed by ATSs for a given security, with other data, such as TAQ, which would provide total share volume for a given security, a researcher would be able to estimate the fraction of ATS trading as a percentage of total trading in NMS securities over the same time period.

[426] Because a "trade-at" provision is already a requirement of the Tick Size Pilot, to the extent that there is overlap between the two pilots and sufficient statistical power, the Commission may be able to obtain valuable information from that pilot without the need to include a trade-at provision in the proposed Transaction Fee Pilot.

exchange trading centers, such as ATSs, would have increased incentives to display prices, and could have effects on the order routing decisions of broker-dealers. Orders routed to exchanges that are not posting the best prices could be indicative of potential conflicts of interest between broker-dealers and their customers. Including a trade-at subgroup could provide supplemental information to the Commission about how a combination of trade-at provisions coupled with revisions to transaction-based fees affect broker-dealer order routing decisions.

From an implementation perspective, including a trade-at provision would result in a pilot that is more complex than the proposed Pilot. As proposed, the Pilot has three test groups for different exogenous shocks to fees or rebates; adding a trade-at provision would double the number of test groups, thereby increasing the costs of implementation for exchanges. Such an addition would also likely increase the difficulty of analyses. The Tick Size Pilot includes a trade-at group because exchanges were concerned that, in the current market environment, a larger tick size could induce order flow to go off-exchange.[427] However, unlike the Tick Size Pilot, the Commission preliminarily believes that as a result of the proposed Transaction Fee Pilot, marketable order flow would be less likely to flow to off-exchange trading centers, because as access fees for some test groups would decline, order flow could be drawn back to exchanges. The Commission, therefore, preliminary believes that the inclusion of the trade-at provision would not likely provide much additional information to address the potential conflicts of interest between broker-dealers and their customers beyond that afforded by the proposal.

3. No Overlap with Tick Size Pilot

As proposed, the Transaction Fee Pilot could overlap with the Tick Size Pilot for some portion of the proposed Pilot duration, although the length of that overlap is uncertain, and the

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[427] See Tick Size Pilot Approval Order, supra note 5, at 27538-42.

Commission preliminarily believes that any anticipated overlap would be minimal and would depend on when the proposed Transaction Fee Pilot would become effective, if adopted. Alternatively, the Commission could consider two separate alternatives that both address the elimination of the overlap of the proposed Transaction Fee Pilot with the Tick Size Pilot: (1) limiting the sample to securities with market capitalizations of at least $3 billion or (2) delaying the implementation of the Pilot until the Tick Size Pilot is concluded.

The first potential alternative is similar to that recommended by EMSAC, whereby the pilot would include only securities with market capitalizations in excess of $3 billion, in order to avoid the simultaneity of the Tick Size Pilot and the proposed Transaction Fee Pilot for a subset of securities. The advantage to this approach is that the proposed Transaction Fee Pilot could start without consideration for the Tick Size Pilot duration, and could reduce implementation and complexity burdens for exchanges and broker-dealers because no subset of securities would be subject to the two pilots simultaneously. However, this approach of only examining the effects of changes on transaction-based fees for securities with market capitalizations of at least $3 billion would significantly reduce the overall sample representativeness desired by the proposed Pilot, which would limit the usefulness of any data obtained from such a pilot. The Commission preliminarily believes that removing these smaller issuers, for which the potential conflicts of interest could likely be the largest,[428] from the proposed Transaction Fee Pilot would limit the value of the information received, and would be less useful to the Commission for informing

[428] See Battalio Equity Market Study, supra note 22; Harris, supra note 23. The negative relationship between access fees and execution quality (realized spreads) increases for low-priced securities, suggesting that low-priced or small capitalization stocks are more likely to have potential conflicts of interest related to transaction-based fees than large capitalization stocks.

future policy recommendations related to these conflicts, as discussed in more detail in Section V.C.1.a.i.A.

Alternatively, the Commission could delay full implementation of the proposed Transaction Fee Pilot until six months after the Tick Size pilot concludes, to the extent that such overlap between the pilots exists. By implementing each pilot sequentially, the Commission would obtain distinct information generated by each pilot, and would reduce the potential costs incurred by exchanges and broker-dealers in implementing simultaneous pilots, as well as the temporary other costs borne by small issuers and other market participants, discussed in detail in Section V.C.2.b. On the other hand, running sequential pilots could delay the benefits of the information the Commission anticipates realizing from the pilot.

The Commission preliminarily believes that the alternative to delay implementing the proposed Transaction Fee Pilot to avoid any overlap (to the extent that such an overlap would otherwise occur) with the Tick Size Pilot would provide minimal cost savings relative to the proposal. As discussed in Section V.C.2.b, the Commission anticipates that the costs associated with overlapping the proposed Transaction Fee Pilot with the Tick Size Pilot could be small. Further, as discussed above, the Commission preliminarily believes the Pilot's design would prevent any overlap, to the extent that overlap between the proposed Transaction Fee Pilot and the Tick Size Pilot occurs, from compromising the Pilot results.

4. Adjustments to the Proposed Transaction Fee Pilot Structure

The alternatives described above provide significant revisions to the approach or the representativeness of the proposed Transaction Fee Pilot. This section discusses a number of alternatives that detail other adjustments to the basic structure of the Pilot as proposed. These include an alternative time frame for the Pilot duration or the pre- and post-Pilot Periods, a zero access fee test group, alternative access fee caps, and the inclusion of non-displayed liquidity or depth-of-book provisions in Test Groups 1 and 2.

As currently proposed, the Transaction Fee Pilot would be implemented for two years with an automatic sunset at the end of the first year, unless the Commission publishes a notice determining that the proposed Pilot shall continue for up to another year. Alternatively, the Commission could recommend an earlier or later Pilot sunset or a longer or shorter Pilot duration. An earlier Pilot sunset would shorten the anticipated proposed Pilot duration, reducing the time period during which potential negative temporary effects resulting from the proposed Pilot could occur. However, if the anticipated duration of the proposed Pilot were sufficiently short, some broker-dealers could either choose to not alter their current order routing behavior and wait out the length of the Pilot, which would limit the usefulness of the information obtained by the Pilot.[429] A shorter anticipated duration also could reduce the usefulness of the information and the benefits provided by the proposed Pilot, if it reduced the statistical power of any analyses, because it would make it more difficult for researchers to detect whether an effect actually exists.[430]

Conversely, as the anticipated Pilot duration increases so too would the costs for exchanges, as this would extend the duration of the changes to their revenue models and the costs of compliance with the proposed Pilot requirements. However, increasing the duration

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[429] See Section V.C.1.a.iii, which discusses the potential limitations associated with pilots, including a discussion that some market participants could choose to not alter their behavior if the proposed Pilot had a short duration.

[430] The Commission staff estimates that it would require a minimum Pilot duration of six months to achieve sufficient statistical power to detect whether an effect is actually present; therefore, any Pilot duration shorter than six months would have limited benefits for detecting the effect of transaction-based fees and rebates on order routing decisions, execution quality, and market quality.

beyond two years is unlikely to provide any significant increases in the benefits identified above. As discussed in Section V.C.1.a.i, the Commission preliminarily believes that the proposed Pilot duration, even with a one-year sunset would make it economically worthwhile for broker-dealers to alter their order-routing decisions, because it would likely be costly for broker-dealers to sit out the full duration of the proposed Pilot or retain pre-Pilot order routing decisions for its duration. Further, a longer Pilot duration would increase the costs associated with a longer time period in which temporary negative externalities arising from the proposed Pilot would exist. These externalities could have longer-term implications on efficiency, competition, and capital formation, and could reduce overall levels of investor protection.

The Commission could alternatively propose a pilot with a fixed two-year duration. A two-year pilot without the possibility of an automatic sunset at the end of the first year would have the same maximum costs as a pilot with a sunset, but would not have the potential to reduce costs in the event that the sunset occurs. The alternative would also not provide the Commission with the flexibility to efficiently end the proposed Pilot early once the Pilot produced sufficient data to obtain representative results. On the other hand, broker-dealers could perceive higher expected costs of not adapting to the Pilot under the alternative because they could expect the sunset to reduce the anticipated duration of the Pilot. However, the Commission preliminarily believes that broker-dealers that base their order routing decisions on transaction-based fees and rebates will incur sufficient costs from not enacting changes to their order routing decisions in response to the Pilot with an expected one-year sunset such that they are not likely to sit out the Pilot Period; therefore, a mandatory two-year pilot would not likely provide any additional behavioral change that would not already be obtainable from the proposed Pilot.

As currently proposed, the Pilot requires a six-month pre-Pilot Period and a six-month post-Pilot Period, which would allow the Commission and the public to compare order routing decisions in the same stocks both with and without the proposed Pilot restrictions as well as across stocks in different test groups. Alternatively, the Commission could propose shorter pre-Pilot and post-Pilot Periods. Shorter pre- and post-Pilot Periods would reduce costs to exchanges of having to provide the Exchange Transaction Fee Summary and order routing data. These reduced costs come at the trade-off of shorter horizons for data collection that could lead to reduced statistical power and reduce the ability of the proposed Pilot to produce representative results.[431]

If the proposed Pilot included a zero access fee test group, this would effectively serve to temporarily remove a source of revenue for exchanges entirely from a subset of securities. This approach could produce additional information, such as how order routing behavior and execution quality changes in the absence of transaction-based fees (and likely rebates), that could be useful to the Commission to facilitate future policy decisions regarding the transaction-based pricing structures of exchanges. However, any new revenue model created during the proposed Pilot could provide additional incentives for broker-dealers to route order flow from customers in a manner that could make possible conflicts of interest more or less pervasive, complicating analysis of the pilot. If a zero access fee test group were included, exchanges would be unable to

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431 The Commission staff estimates the pilot would need to produce approximately six months of data to detect changes unique to ETPs, and between 60 and 69 days of data to detect changes unique to small and large NMS stocks, respectively. The methodology employed provided power tests on the distributions of average daily dollar volume data for ETPs and small and large capitalization NMS common stocks obtained from the CRSP U.S. Stock Database. The power tests determined the number of days of data that would be required to detect a 10% change in the daily volume of various subgroups of securities.

charge access fees to market participants that take liquidity from maker-taker markets or make liquidity on taker-maker exchanges. The inclusion of a zero access fee test group would thus completely eliminate the transaction-based fee model for a subset of securities, which could force exchanges to create entirely new revenue models for securities in this test group. Although inclusion of a zero access fee test group could potentially provide expanded information to the Commission and the public about possible conflicts of interest, the Commission notes that these would come at the cost of lost revenue to exchanges for eliminating transaction-based fees entirely or costs associated with the creation of new revenue models only for the duration of the Pilot.

The Pilot, as currently proposed, would have three test groups: (1) one that caps access fees at $0.0015; (2) one that caps access fees at $0.0005; and (3) one that prohibits rebates or Linked Pricing for displayed and non-displayed liquidity and along the entire depth of the limit order book. Alternatively, the Commission could have proposed other test groups with different caps on access fees. For example, the Commission could have proposed only caps to access fees, similar to those in the EMSAC recommendation,[432] or could have increased the number of test groups. Only studying exogenous shocks to access fees would have limited the amount and type of information available to the Commission, given that the theoretical literature suggests that potential conflicts of interest are linked to rebates more than to access fees. Any alternative would likely replace the zero rebate test group with another access fee cap group. Thus, without a test group that specifically focuses on the removal of rebates and the corresponding impact on conflicts of interest, the Commission and the public would have a set of information of lower

[432] The maximum access fee caps under the EMSAC recommendation would be $0.0020 (Test Group 1), $0.0010 (Test Group 2), and $0.0002 (Test Group 3).

value than it would otherwise. An alternative to increase the number of test groups could produce more gradation in the caps to access fees, this alternative would likely increase the complexity of the proposed Pilot, and would increase the implementations costs to account for the additional test groups. These costs would be borne with little incremental benefit to the quality of information produced from these additional test groups, because these additional groups would only provide minor variations in access fees from those already proposed.

As the Pilot is currently proposed, only Test Group 3, which eliminates rebates or Linked Pricing, would restrict fees or rebates or Linked Pricing in non-displayed liquidity and depth-of-book. As discussed in Section III.C.3, under the proposed Pilot, perverse incentives to move liquidity away from the displayed liquidity or the top-of-book could be created if rebates are not eliminated along the entire book and for displayed and non-displayed liquidity. As an alternative to the current Pilot proposal, the Transaction Fee Pilot could also revise access fees in Test Groups 1 and 2 to cover both non-displayed liquidity and the depth-of-book. Unlike the problem associated with moving away from displayed liquidity that could emerge if rebates or Linked Pricing were not removed from the entire depth of the limit order book, the Commission does not believe that under the proposed Pilot incentives would emerge for exchanges to charge more to access non-displayed interest or depth-of-book quotes. Such differing fees across displayed and non-displayed liquidity as well as the depth of the limit order book would lead to increased uncertainty for market participants that take liquidity, as they would not be able to control whether their executions are with displayed or non-displayed liquidity. If the fees differed between displayed and non-displayed liquidity, broker-dealers would face cost uncertainty when making routing decisions over what access fees they would incur. From the exchanges' perspective, having differing fees for posting or interacting with displayed and non-displayed liquidity would be burdensome to track and more costly to administer and, to the extent the uncertainty it creates dissuades market participants from routing to their market, could ultimately cause them to lose order flow. Accordingly, the Commission preliminarily believes that it is unnecessary to mandate transaction-based fee caps for the non-displayed liquidity.

Under the current proposal, Test Group 3 would prohibit rebates or Linked Pricing on NMS stocks (including ETPs). Alternatively, the Commission could instead prohibit only rebates, without any extension to other similar inducements that an exchange might use to attract order flow. The Commission, however, believes that an alternative that excludes like inducements from Test Group 3 would provide opportunities for exchanges to work around the rebate prohibition, which would likely reduce the effectiveness of the information received about NMS stocks (including ETPs) in Test Group 3.

The Commission alternatively could propose a limitation on Linked Pricing across all Test Groups, not just Test Group 3. Given that Test Groups 1 and 2 would undergo a reduction in fees due to the lower caps in each of those groups, which likely would lead to a corresponding reduction in rebates, exchanges may choose to alter other like incentives, which would allow them to supplement the incentive they provide for activity in securities in Test Groups 1 and 2, and could distort the information obtained from the Pilot. However, from the exchanges' perspective, enhancing like inducements would further erode margins related to transaction activity. Therefore, the Commission preliminarily believes that it is unnecessary to prohibit like inducements for Test Groups 1 and 2.

As currently proposed, the Transaction Fee Pilot does not require the exchanges to produce much additional information on order execution quality statistics. As an alternative, the Commission could require that the exchanges produce daily Rule 605 data similar to that required in Appendix B.1 of the Tick Size Pilot Plan. Providing daily order execution quality statistics are important for the Tick Size Pilot, because order size is influenced by tick size, and is an important determinant of execution quality. As a result, trade-based measures of the effect of the Tick Size Pilot might not yield the same results as order-based measures of the Tick Size Pilot, such as that in data required in Appendix B.1 of the Tick Size Pilot Plan. However, the proposed Transaction Fee Pilot might not alter order sizes nearly as dramatically as in the Tick Size Pilot, or might not alter them at all. Therefore, the Commission preliminarily does not expect that results of the proposed Transaction Fee Pilot using trade-based execution quality measures to differ from results using order-based execution quality measures. Even though exchanges have systems in place to capture some elements of daily data as required by the Tick Size Pilot, including this data could be costly for the exchanges to provide with limited benefit for the proposed Transaction Fee Pilot. As currently proposed, the Transaction Fee Pilot would provide daily information on shares submitted, executed, and cancelled to an exchange, and would provide some limit order execution quality information, such as time to execution and likelihood of execution, that are not currently available from other existing data sources.[433]

As the Pilot is currently proposed, downloadable files containing the Exchange Transaction Fee Summary would need to be publicly posted on each exchange's website using an XML schema to be published on the Commission's website. Alternatively, similar to the List of Pilot Securities, the Exchange Transaction Fee Summary could be reported in pipe-delimited ASCII format. However, the pipe-delimited ASCII format does not support validations. As discussed earlier, validations help ensure that comparable data are formatted consistently and

[433] For example, existing studies often incorporate execution quality statistics estimated from TAQ data. See, e.g., Battalio Equity Market Study, supra note 22.

reported completely. Validations also help the exchanges to test whether the data are complete and formatted correctly before posting the data. Because the pipe-delimited ASCII format does not support validations, exchanges have to manually review data completeness and correct formatting. In the case that an exchange was to post incorrectly formatted or incomplete data, the exchange would have to incur the burden of reviewing the data again to identify the problem and reposting the data. Validations help ensure that any inconsistencies in data completeness or formatting can be automatically tested for and identified before posting. And because some fields in the data may be manually entered (i.e., the Exchange Transaction Fee Summary), having validations would help ensure the quality of this data. Requiring a format that incorporates validations would also best enhance data users' abilities to normalize, aggregate, compare, and analyze the Exchange Transaction Fee Summary data because the data is assured to be complete and consistently formatted. Therefore, the Commission does not believe that the Exchange Transaction Fee Summary should be reported in pipe-delimited ASCII format as that would limit both the data's accessibility and ease of use.

F. Request for Comment

The Commission seeks commenters' views and suggestions on all aspects of its economic analysis of the proposed rule. In particular, the Commission asks commenters to consider the following questions:

71. Is the proposed Pilot, in the form of a temporary Commission rule, necessary to achieve the objectives of this Pilot? Are there other approaches that would achieve these objectives? Has the Commission appropriately evaluated the benefits and costs of conducting successive (or potentially simultaneous) pilots?

72. Is there existing data that could yield the same information, with respect to sample representativeness and causality, on the relation between transaction-based fees and rebates on order routing behavior, execution quality and market quality that could be obtained by the Commission in place of the proposed Transaction Fee Pilot? Please explain in detail.

73. Is there additional data that the Commission should gather from the proposed Pilot? Please be specific as to what this data would be and how it could inform the Commission about possible conflicts of interest related to access fees and rebates.

74. Do you believe the Commission's assessment of the baseline for economic analysis is reasonable? Why or why not? Please explain in detail.

75. Do you believe that the proposing release accurately describes the baseline and how those current practices could change under the proposed Pilot? Why or why not? Please explain in detail.

76. Do you believe that the Commission has accurately described how market participants would be affected by the proposed Transaction Fee Pilot? Why or why not? Please explain in detail.

77. Do you believe that the Commission has accurately described the benefits of the information that would be received from the proposed Transaction Fee Pilot? Why or why not? Please explain in detail.

78. Is the Commission's analysis of the costs and benefits of the proposed Transaction Fee Pilot accurate and complete? Why or why not? Please explain in detail.

79. Do you believe that there are costs or benefits that would accrue to investors likely as a result of the proposed Pilot? If so, please explain in detail.

80. Do you believe that there are additional costs that may arise from the proposed Transaction Fee Pilot? If so, do you believe there are methods by which the Commission could reduce the costs imposed by the proposed Pilot while still achieving its goals? Please explain in detail.

81. Do you believe that the order routing data could facilitate the reverse engineering of proprietary order routing strategies despite the daily aggregation and anonymization of the data at the broker-dealer level? Why or why not? If so, do you believe that there are alternative, safer methods of providing the order routing data that would still allow the Pilot to achieve its goals? Please explain in detail.

82. Do you believe that there are additional benefits or costs that could be quantified or otherwise monetized? Why or why not? If so, please identify the categories, and if possible, provide specific estimates or data.

   a. Given that the Tick Size Pilot requires exchanges to compile a daily list of pilot securities and to identify changes to those pilot securities due to name changes, mergers, and other corporate events, are the costs estimated for compliance with reporting of the daily pilot list for the proposed Transaction Fee Pilot reasonable?

   b. Given that exchanges submit Form 19b-4 fee filings to the Commission regularly, are the costs estimated for Form 19b-4 fee filings associated with the commencement of the proposed Pilot or for periodic revisions to transaction-based fees and rebates reasonable?

c. As exchanges frequently update their transaction-based fees and rebates, can market participants provide estimates of the costs associated with updating order routing systems as a result of fee changes?

83. Are there any effects on efficiency, competition, and capital formation that are not identified or are misidentified in the above analysis? Please be specific and provide data and analysis to support your views.

84. Do you believe that the Commission has accurately described how the competitive landscape for the market for trading services for NMS securities would be temporarily affected by the proposed Transaction Fee Pilot? Why or why not? Please explain in detail. Does the release discuss all relevant forms of competition and whether the proposal could alter them? If not, which additional forms of competition could the proposed Pilot impact and how? Please explain in detail.

85. Are there alternative approaches to reporting fee data in XML format that would facilitate ease of use? What are the likely costs of compliance of the proposed requirements? Please explain in detail.

86. Would any alternative approaches outlined above better achieve the objectives articulated by the Commission? Which approach and why? What would be the costs and benefits of these approaches? Please explain in detail.

87. Would the inclusion of ATSs in the proposed Transaction Fee Pilot better achieve the objectives articulated by the Commission? What would be the costs and benefits of including these venues? Please explain in detail.

88. What should be the appropriate length of the pre-Pilot Period and post-Pilot Period in terms of achieving sufficient statistical power?

89. What other economic effects are likely to be associated with the proposed Transaction Fee Pilot?

VI. Consideration of Impact on the Economy

For purposes of the Small Business Regulatory Enforcement Fairness Act of 1996 ("SBREFA"),[434] the Commission requests comment on the potential effect of the proposed rule 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.

VII. Regulatory Flexibility Analysis

The Regulatory Flexibility Act ("RFA")[435] requires Federal agencies, in promulgating rules, to consider the impact of those rules on small entities. Section 603(a)[436] of the Administrative Procedure Act,[437] 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."[438] Section 605(b) of the RFA

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[434] Pub. L. No. 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).

[435] 5 U.S.C. 601 et seq.

[436] 5 U.S.C. 603(a).

[437] 5 U.S.C. 551 et seq.

[438] The Commission has adopted definitions for the term "small entity" for purposes of Commission rulemaking in accordance with the RFA. Those definitions, as relevant to

states that this requirement shall not apply "to any proposed or final rule if the head of the agency certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities"[439]

The proposed rule would apply to national securities exchanges registered with the Commission under Section 6 of the Exchange Act.[440] With regard to a national securities exchange, the Commission's definition of a small entity is an exchange that has been exempt from the reporting requirements of Rule 601 of Regulation NMS, and is not affiliated with any person (other than a natural person) that is not a small business or small organization.[441] None of the national securities exchanges registered under Section 6 of the Exchange Act that would be subject to the proposed Pilot are "small entities" for purposes of the RFA. In particular, none of the equities exchanges are exempt from Rule 601 of Regulation NMS.

As discussed above, the proposed rule will not apply to any "small entities." Therefore, for the purposes of the RFA, the Commission certifies that the proposed rule would not have a significant economic impact on a substantial number of small entities.

The Commission requests comment regarding this certification. In particular, the Commission solicits comment on the following:

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this proposed rulemaking, are set forth in Rule 0-10, 17 CFR 240.0-10. See Securities Exchange Act Release No. 18451 (January 28, 1982), 47 FR 5215 (February 4, 1982) (File No. AS-305).

439 5 U.S.C. 605(b).

440 See supra Sections IV (Paperwork Reduction Act) and V (Economic Analysis) (discussing, among other things, the current market environment and compliance obligations for national securities exchanges).

441 See 17 CFR 240.0-10(e).

90. Do commenters agree with the Commission's certification? If not, please describe the nature of any impact on small entities and provide empirical data to illustrate the extent of the impact.

VIII. Statutory Authority and Text of the Proposed Rule

Pursuant to the Exchange Act, and particularly Sections 3(b), 5, 6, 11A, 15, 17, and 23(a) thereof, 15 U.S.C. 78c, 78e, 78f, 78k-1, 78o, 78q, and 78w(a), the Commission proposes to amend Title 17 of the Code of Federal Regulations in the manner set forth below.

List of Subjects

17 CFR Part 200

Administrative practice and procedure, Authority delegations (Government agencies), Organization and functions (Government agencies).

17 CFR Part 242

Brokers, Reporting and recordkeeping requirements, Securities.

For the reasons set out in the preamble, the Commission is proposing to amend Title 17, Chapter II of the Code of Federal Regulations as follows:

PART 200 – ORGANIZATION; CONDUCT AND ETHICS; AND INFORMATION AND REQUESTS

1. The authority citation for Part 200 continues to read in part as follows:

Authority: 15 U.S.C. 77c, 77o, 77s, 77z-3, 77sss, 78d, 78d-1, 78d-2, 78o-4, 78w, 78*ll*(d), 78mm, 80a-37, 80b-11, 7202, and 7211 *et seq.*, unless otherwise noted.

2. Amend Section 200.30-3 by adding new subparagraph (a)(84) to read as follows:

§200.30-3 Delegation of Authority to Director of Division of Trading and Markets.

* * * * *

(a) * * *

(84) To issue notices pursuant to Rule 610T(b)(1)(i) and (c) (17 CFR 242.610T(b)(1)(i) and (c)).

* * * * *

PART 242 – REGULATIONS M, SHO, ATS, AC, NMS AND SBSR AND CUSTOMER MARGIN REQUIREMENTS FOR SECURITY FUTURES

3. The authority citation 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.

4. Add Section 242.610T to read as follows:

§ 242. 610T Equity transaction fee pilot.

(a) Pilot Pricing Restrictions. Notwithstanding Rule 610(c), on a pilot basis for the period specified in paragraph (c) below, in connection with a transaction in an NMS stock, a national securities exchange may not:

(1) for Test Group 1, impose, or permit to be imposed, any fee or fees for the display of, or execution against, the displayed best bid or offer of such market that exceed or accumulate to more than $0.0015 per share;

(2) for Test Group 2, impose, or permit to be imposed, any fee or fees for the display of, or execution against, the displayed best bid or offer of such market that exceed or accumulate to more than $0.0005 per share;

(3) for Test Group 3, provide to any person, or permit to be provided to any person, a rebate or other remuneration in connection with an execution, or

offer, or permit to be offered, any linked pricing that provides a discount or incentive on transaction fees applicable to removing (providing) liquidity that is linked to providing (removing) liquidity, except to the extent the exchange has a rule to provide non-rebate linked pricing to its registered market makers in consideration for meeting market quality metrics; and

(4) for the <u>Control Group</u>, impose, or permit to be imposed, any fee or fees in contravention of the limits specified in 17 CFR 242.610(c).

(b) <u>Pilot Securities.</u>

(1) Initial List of Pilot Securities.

(i) The Commission shall designate by notice the initial List of Pilot Securities, and shall assign each Pilot Security to one Test Group or the Control Group.

(ii) For purposes of Rule 610T, "Pilot Securities" means the NMS stocks designated by the Commission on the initial List of Pilot Securities pursuant to paragraph (b)(1)(i) and any successors to such NMS stocks. At the time of selection by the Commission, an NMS stock must have a minimum initial share price of at least \$2 to be included in the Pilot and must have an unlimited duration or a duration beyond the end of the post-Pilot Period. If the share price of a Pilot Security in one of the Test Groups or the Control Group closes below \$1 at the end of a trading day, it shall be removed from the Test Group or the Control Group and will no longer be subject to the pricing restrictions set forth in (a)(1)-(3) above.

(iii) For purposes of Rule 610T, "primary listing exchange" means the national securities exchange on which the NMS stock is listed. If an NMS stock is listed on more than one national securities exchange, the national securities exchange upon which the NMS stock has been listed the longest shall be the primary listing exchange.

(2) Pilot Securities Exchange Lists.

(i) After the Commission selects the initial List of Pilot Securities and prior to the beginning of trading on the first day of the Pilot Period each primary listing exchange shall publicly post on its website downloadable files containing a list, in pipe-delimited ASCII format, of the Pilot Securities for which the exchange serves as the primary listing exchange. Each primary listing exchange shall maintain and update this list as necessary prior to the beginning of trading on each business day that the U.S. equities markets are open for trading through the end of the post-Pilot Period.

(ii) The Pilot Securities Exchange Lists shall contain the following fields:

(A) Ticker Symbol;

(B) Security Name;

(C) Primary Listing Exchange;

(D) Security Type:

(1) Common Stock;

(2) ETP;

(3) Preferred Stock;

(4) Warrant;

(5) Closed-End Fund;

(6) Structured Product;

(7) ADR;

(8) Other;

(E) Test Group:

(1) Control Group;

(2) Test Group 1;

(3) Test Group 2;

(4) Test Group 3;

(F) Date the Entry Was Last Updated.

(3) Pilot Securities Change Lists.

(i) Prior to the beginning of trading on each trading day the U.S. equities markets are open for trading throughout the duration of the Pilot, including the post-Pilot Period, each primary listing exchange shall publicly post on its website downloadable files containing a Pilot Securities Change List, in pipe-delimited ASCII format, that lists each separate change applicable to any Pilot Securities for which it serves or has served as the primary listing exchange. The Pilot Securities Change List will provide a cumulative list of all changes to the Pilot Securities that the primary listing exchange has made to the Pilot Securities Exchange List published pursuant to (b)(2).

(ii) In addition to the fields required for the Pilot Securities Exchange List, the Pilot Securities Change Lists shall contain the following fields:

(A) New Ticker Symbol (if applicable);

(B) New Security Name (if applicable);

(C) Deleted Date (if applicable);

(D) Date Security Closed Below $1 (if applicable);

(E) Effective Date of Change; and

(F) Reason for the Change.

(4) Posting Requirement. All information publicly posted in downloadable files pursuant to 610T(b)(2) and (3) shall be and remain freely and persistently available and easily accessible by the general public on the primary listing exchange's website for a period of not less than five years from the conclusion of the post-Pilot Period. In addition, the information shall be presented in a manner that facilitates access by machines without encumbrance, and shall not be subject to any restrictions, including restrictions on access, retrieval, distribution and reuse.

(c) <u>Pilot Duration.</u>

(1) The Pilot shall include a six-month "pre-Pilot Period;"

(2) a two-year "Pilot Period" with an automatic sunset at the end of the first year unless, no later than thirty days prior to that time, the Commission publishes a notice that the Pilot shall continue for up to another year; and

(3) a six-month "post-Pilot Period."

(4) The Commission shall designate by notice the commencement and termination dates of the pre-Pilot Period, Pilot Period, and post-Pilot Period, including any suspension of the one-year sunset of the Pilot Period.

(d) Order Routing Datasets. Throughout the duration of the Pilot, including the pre-Pilot Period and post-Pilot Period, each national securities exchange that trades NMS stocks shall publicly post on its website downloadable files, in pipe-delimited ASCII format, no later than the last day of each month, containing sets of order routing data, for the prior month, in accordance with the specifications below. For the pre-Pilot Period, order routing datasets shall include each NMS stock. For the Pilot Period and post-Pilot Period, order routing datasets shall include each Pilot Security. All information publicly posted pursuant to this paragraph (d) shall be and remain freely and persistently available and easily accessible by the general public on the national securities exchange's website for a period of not less than five years from the conclusion of the post-Pilot Period. In addition, the information shall be presented in a manner that facilitates access by machines without encumbrance, and shall not be subject to any restrictions, including restrictions on access, retrieval, distribution, and reuse. Each national securities exchange shall treat the identities of broker-dealers contained in the Order Routing Datasets, including the broker-dealer anonymization key, as regulatory information and shall not access or use that information for any commercial or non-regulatory purpose.

(1) Dataset of daily volume statistics include the following specifications of liquidity-providing orders by security and separating held and not-held orders in pipe-delimited ASCII format with field names as the first record and a consistent naming convention that indicates the exchange and date of the file:

  (i) Code identifying the submitting exchange.

  (ii) Eight-digit code identifying the date of the calendar day of trading in the format “yyyymmdd.”

  (iii) Symbol assigned to an NMS stock (including ETPs) under the national market system plan to which the consolidated best bid and offer for such a security are disseminated.

  (iv) Unique, anonymized broker-dealer identification code.

  (v) Order type code

    (A) Inside-the-quote orders;

    (B) At-the-quote limit orders; and

    (C) Near-the-quote limit orders.

  (vi) Order size codes

    (A) <100 share bucket;

    (B) 100-499 share bucket;

    (C) 500-1,999 share bucket;

    (D) 2,000-4,999 share bucket;

(E) 5,000-9,999 share bucket; and

(F) > 10,000 share bucket.

(vii) Number of orders received.

(viii) Cumulative number of shares of orders received.

(ix) Cumulative number of shares of orders cancelled prior to execution.

(x) Cumulative number of shares of orders executed at receiving market center.

(xi) Cumulative number of shares of orders routed to another execution venue.

(xii) Cumulative number of shares of orders executed within

(A) 0 to < 100 microseconds of order receipt;

(B) 100 microseconds to < 100 milliseconds of order receipt;

(C) 100 milliseconds to < 1 second of order receipt;

(D) 1 second to < 30 seconds of order receipt;

(E) 30 seconds to < 60 seconds of order receipt;

(F) 60 seconds to < 5 minutes of order receipt;

(G) 5 minutes to < 30 minutes of order receipt; and

(H) >30 minutes of order receipt.

(2) Dataset of daily volume statistics include the following specifications of liquidity-taking orders by security and separating held and not-held orders in pipe-delimited ASCII format with field names as the first record and a

consistent naming convention that indicates the exchange and date of the file:

(i) Code identifying the submitting exchange.

(ii) Eight-digit code identifying the date of the calendar day of trading in the format "yyyymmdd."

(iii) Symbol assigned to an NMS stock (including ETPs) under the national market system plan to which the consolidated best bid and offer for such a security are disseminated.

(iv) Unique, anonymized broker-dealer identification code.

(v) Order type code

  (A) Market orders; and

  (B) Marketable limit orders.

(vi) Order size codes

  (A) <100 share bucket;

  (B) 100-499 share bucket;

  (C) 500-1,999 share bucket;

  (D) 2,000-4,999 share bucket;

  (E) 5,000-9,999 share bucket; and

  (F) > 10,000 share bucket.

(vii) Number of orders received.

(viii) Cumulative number of shares of orders received.

(ix) Cumulative number of shares of orders cancelled prior to execution.

(x) Cumulative number of shares of orders executed at receiving market center.

(xi) Cumulative number of shares of orders routed to another execution venue.

(e) Exchange Transaction Fee Summary. Throughout the duration of the Pilot, including the pre-Pilot Period and post-Pilot Period, each national securities exchange that trades NMS stocks shall publicly post on its website downloadable files containing information relating to transaction fees and rebates and changes thereto (applicable to securities having a price greater than $1). Each national securities exchange shall post its initial Exchange Transaction Fee Summary prior to the start of trading on the first day of the pre-Pilot Period and update its Exchange Transaction Fee Summary on a monthly basis within 10 business days of the first day of each calendar month, to reflect data collected for the prior month. The information prescribed by this section shall be made available using the most recent version of the XML schema published on the Commission's website. All information publicly posted pursuant to this paragraph (e) shall be and remain freely and persistently available and easily accessible on the national securities exchange's website for a period of not less than five years from the conclusion of the post-Pilot Period. In addition, the information shall be presented in a manner that facilitates access by machines without encumbrance, and shall not be subject to any restrictions, including restrictions on access, retrieval, distribution, and reuse. The Exchange Transaction Fee Summary shall contain the following fields:

(1) SRO Name;

(2) Record Type Indicator:

  (i) Reported Fee is the Monthly Average;

  (ii) Reported Fee is the Median;

  (iii) Reported Fee is the Spot Monthly;

(3) Participant Type:

  (i) Registered Market Maker;

  (ii) All Others;

(4) Test Group:

  (i) Control Group;

  (ii) Test Group 1;

  (iii) Test Group 2;

  (iv) Test Group 3;

(5) Applicability to Displayed and Non-Displayed Interest:

  (i) Displayed only;

  (ii) Non-displayed only;

  (iii) Both displayed and non-displayed;

(6) Applicability to Top and Depth of Book Interest:

  (i) Top of book only;

  (ii) Depth of book only;

  (iii) Both top and depth of book;

(7) Effective Date of Fee or Rebate;

(8) End Date of Currently Reported Fee or Rebate (if applicable);

(9) Month and Year of the monthly realized reported average and median per share fees;

(10) Pre/Post Fee Changes Indicator (if applicable) denoting implementation of a new fee or rebate on a day other than the first day of the month;

(11) Base and Top Tier Fee or Rebate:

- (i) Take (to remove):
  - (A) Base Fee/Rebate reflecting the standard amount assessed or rebated before any applicable discounts, tiers, caps, or other incentives are applied;
  - (B) Top Tier Fee/Rebate reflecting the amount assessed or rebated after any applicable discounts, tiers, caps, or other incentives are applied;
- (ii) Make (to provide):
  - (A) Base Fee/Rebate reflecting the standard amount assessed or rebated before any applicable discounts, tiers, caps, or other incentives are applied;
  - (B) Top Tier Fee/Rebate reflecting the amount assessed or rebated after any applicable discounts, tiers, caps, or other incentives are applied;

(12) Average Take Fee (Rebate) / Average Make Rebate (Fee), by Participant Type, Test Group, Displayed/Non-Displayed, and Top/Depth of Book; and

(13) Median Take Fee (Rebate) / Median Make Fee (Rebate), by Participant Type, Test Group, Displayed/Non-Displayed, and Top/Depth of Book.

The following will not appear in the Code of Federal Regulations.

Exhibit 1: Data definitions for the Exchange Transaction Fee Summary

The table below represents the data model for the reporting requirements of an Exchange Transaction Fee Summary. This data model reflects the disclosures required by proposed 17 CFR 242.610T(e) and the logical representation of those disclosures to a corresponding XML element. The Commission's proposed XML schema is the formal electronic representation of this data model.

- Concept - the information content as described in proposed 17 CFR 242.610T(e) items 1 through 12.
- Element - a name for the XML element.
- Type - the XML data type, either a list of possible values or a general type such as "number".
- Spot, Monthly - How the element appears in a record of that type.
    - R - Required. The XML file is not valid unless this element is present.
    - NA - Not applicable. The element may appear in the record but its value is not to be used.
    - O - Optional. The XML file is valid without that element; whether it appears for a particular SRO, record type, test group, etc., depends on the actual fee being described. XML validation by itself cannot determine this.
- When Absent - If the element is absent, its value is interpreted as if it had been present with the value shown.
- Definition - Text to be included in the XML definition file ("schema").

Concept	Element	Type	Spot	Monthly	When Absent	Definition
SRO	sro	Non-empty Text	R	R		A required unique code to identify each SRO in the Transaction Fee Pilot.
Record Type	rt	S or M	R	R		A required record type indicator. M, if the fee type reported is the monthly realized fee (average or median fee); S, if the fee type reported is a spot fee schedule (base or top tier fee).

Participant Type	ptcpt	MM, Other or Blank	O	O	Blank	MM, if the fees are for market makers, or else Other. Required for spot records if the exchange charged market makers and others different base and top tier fees. Required for monthly fee records if the exchange charged different average or median fees or pays different average or median fees. Otherwise blank or absent.
Test Group	grp	1, 2, 3, or C	R	R		A required indicator that identifies the test or control group during the Pilot and post-Pilot Period. 1, 2, 3 - Test Groups 1, 2, 3; C - Control group.
Displayed	disp	D, N, or B	R	R		D - Displayed, N - Not displayed, B - Both. For spot fee type records, if the fees are the same between displayed and non-displayed liquidity, then the exchange may report both in a single "B" record. For monthly records, this should be segmented into the average and median fee per share for displayed liquidity, and the average and median fee for non-displayed liquidity unless there are no differences between the average and median fees for displayed and non-displayed liquidity, in which case the exchange can report the average and median fee in a single “B” record.
Top/Depth	topOr Depth	T, D, or B.	R	R		T - Fees for top-of-book liquidity; D - Fees for depth-of-book liquidity; B - Both. For spot records, if the fees are the same between top-of-book and depth-of-book liquidity, then the exchange may report both fees in a single "B" record. For monthly records, if there are no differences between the fees for top-of-book and depth-of-book liquidity, then the exchange may include only the average and median fees in a single "B" record.
Start Date	start	YYYY-MM-DD	R	O		The start date element must be present for a spot fee record, and the end element cannot appear alone. The effective date for any fee changes. This should correspond to the effective date referenced in the Form 19b-4 fee filings submitted to the Commission. This is needed in a monthly record only if fees changed on a day other than the first of the month; otherwise blank or absent.

End Date	end	YYYY-MM-DD or Blank	O	O	Blank	The last date that a given fee is viable prior to any fee changes. This column will be blank unless a mid-month change to fees is made. This should correspond to the last date that a given fee is applicable prior to the effective date of the new fee reflected in Form 19b-4 fee filings submitted to the Commission to capture any revisions to transaction-based fees and rebates. This is needed in a monthly record only if fees changed on a day other than the first of the month.
Month and Year	Year Month	YYYY-MM	NA	R		The year and month of the monthly realized reported average and median per share fees.
Pre/Post	preOrPost	1, 2, or Blank	O	O	Blank	An indicator variable needed only if the exchange changed fees on a day other than the first day of the month. Blank-there were no fee changes other than on the first day of the month. 1 - The average and median are the pre-change average and median for the part of the month prior to the change. 2 - The average and median are the post-change average and median for the part of the month after the change.
Base Taker Fee	baseTake Fee	Number	R	NA		The Base Taker Fee is the standard per share fee assessed or rebate offered before any applicable discounts, tiers, caps, or other incentives are applied. Fees have a positive sign; rebates have a negative sign.
Top Tier Taker Fee	topTier TakeFee	Number	R	NA		The Top Tier Taker Fee is the per share fee assessed or rebate offered after all applicable discounts, tiers, caps, or other incentives are applied. Fees have a positive sign; rebates have a negative sign.
Average Taker Fee	avgTake Fee	Number	NA	R		The monthly average realized Taker fee assessed or rebate offered per share by category (i.e., test group, participant type, displayed vs. non-displayed, and top-of-book vs. depth-of-book). Fees have a positive sign; rebates have a negative sign.

Median Taker Fee	median TakeFee	Number	NA	R		The monthly median realized Taker fee assessed or rebate offered per share by category (i.e., test group, participant type, displayed vs. non-displayed, and top-of-book vs. depth-of-book), across broker-dealers. Fees have a positive sign; rebates have a negative sign.
Base Maker Fee	baseMake Fee	Number	R	NA		The Base Maker Fee is the standard per share fee assessed or rebate offered before any applicable discounts, tiers, caps, or other incentives are applied. Fees have a positive sign; rebates have a negative sign.
Top Tier Maker Fee	topTier MakeFee	Number	R	NA		The Top Tier Maker Fee is the per share fee assessed or rebate offered all applicable discounts, tiers, caps, or other incentives are applied per share. Fees have a positive sign; rebates have a negative sign.
Average Maker Fee	avgMake Fee	Number	NA	R		The monthly average realized Maker fee assessed or rebate offered per share by category (i.e., test group, participant type, displayed vs. non-displayed, and top-of-book vs. depth-of-book). Fees have a positive sign; rebates have a negative sign.
Median Maker Fee	median MakeFee	Number	NA	R		The monthly median realized Maker fee assessed or rebate offered per share by category (i.e., test group, participant type, displayed vs. non-displayed, or top-of-book vs. depth-of-book), across broker-dealers. Fees have a positive sign; rebates have a negative sign.

By the Commission.

Dated: March 14, 2018

Brent J. Fields
Secretary