SECURITIES AND EXCHANGE COMMISSION

17 CFR Parts 200 and 242
[Release No. 34-84875; File No. S7-05-18]

RIN 3235-0761

Transaction Fee Pilot for NMS Stocks

AGENCY: Securities and Exchange Commission.

ACTION: Final rule.

SUMMARY: The Securities and Exchange Commission (“Commission” or “SEC”) is adopting a new rule of Regulation National Market System (“Regulation NMS”) under the Securities and Exchange Act of 1934 (“Exchange Act”) to conduct a Transaction Fee Pilot (“Pilot”) for National Market System (“NMS”) stocks to study the effects that exchange transaction fee-and-rebate pricing models may have on order routing behavior, execution quality, and market quality. The Commission expects the data generated by the Pilot, combined with data from existing sources, will facilitate an empirical evaluation of whether the existing exchange transaction-based fee and rebate structure is operating effectively to further statutory goals.

DATES: Effective date: April 22, 2019 through December 29, 2023.

Compliance date: As designated by Notice pursuant to 17 CFR 242.610T(c)(2).

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SUPPLEMENTARY INFORMATION: The Commission is adopting new 17 CFR 242.610T (Rule 610T) to conduct a Transaction Fee Pilot for NMS stocks.

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I. Executive Summary of Rule 610T
Congress directed the Commission, through Section 11A of the Exchange Act, to facilitate the establishment of a national market system and use its broad authority to carry out the objectives of Section 11A, including, among others, to assure the economically efficient execution of securities transactions. In furtherance of these goals, and as part of its oversight of registered national securities exchanges, the Commission periodically undertakes reviews of various aspects of market structure and current regulations to evaluate whether, in light of changes in technology and business practices, the current regulatory framework continues to fairly, effectively, and efficiently promote fair and orderly markets, serve the public interest and the protection of investors, and promote capital formation.

As discussed below, one aspect of the current regulatory framework focuses on the current pricing and fee structure for transactions in securities. As the Commission discussed in its Pilot proposal, the predominant transaction pricing structure that developed among equities exchanges to attract order flow is the “maker-taker” fee model. Specifically, out of thirteen equities exchanges, seven utilize the “maker-taker” fee model, in which they pay a rebate to a provider of liquidity and charge a fee to a taker of liquidity. Among the remaining exchanges, four utilize a “taker-maker” pricing model (also called an inverted model) where they charge a fee to a provider of liquidity and pay a rebate to a taker of liquidity, and two have a “flat fee” model. In recent years this area has
attracted considerable attention and generated significant debate, focusing on the effects, both positive and negative, that exchange transaction-based pricing models may have on market quality and execution quality, with some commenters advocating action by the Commission. The Commission is uniquely situated and vested with the responsibility under Section 11A of the Exchange Act to examine the impact that this aspect of our market structure has on our national market system. And, in light of the questions raised about the impact of these fee models and the amount of attention garnered, we believe this is an area ripe for Commission review. But, the Commission currently lacks the data necessary to meaningfully analyze the impact that exchange transaction fee-and-rebate pricing models have on order routing behavior, market and execution quality, and our market structure generally. To address this information gap, the Commission has designed the Pilot to produce data that will facilitate a more thorough understanding of the potential issues associated with exchange transaction-based pricing models. In particular, the Commission has designed the Pilot to gather data on the effect both current regulatory fee caps and rebates have on market quality and execution quality. The data gathered will assist the Commission in determining whether any changes in the current regulatory framework are appropriate and enable the Commission to make more informed and effective policy decisions. This, in turn, enables the Commission to carry out the objectives of the national market system and oversee the national securities exchanges.

As discussed fully in the proposing release, the Commission proposed a pilot to test the effect of exchange transaction fees and rebates. The following chart summarizes the terms of the Pilot as adopted, which are discussed in more detail below:

**TRANSACTION FEE PILOT FOR NMS STOCKS**

<table>
<thead>
<tr>
<th>Duration</th>
<th>2 years with an automatic sunset at 1 year unless, no later than 30 days prior to that time, the Commission publishes a notice that the pilot shall continue for up to 1 additional year; plus a 6-month pre-Pilot Period and 6-month post-Pilot Period.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable trading centers.</td>
<td>Equities exchanges (including maker-taker &amp; taker-maker) but not ATSs or other non-exchange trading centers.</td>
</tr>
<tr>
<td>Pilot securities</td>
<td>NMS stocks with average daily trading volumes ≥30,000 shares with a share price ≥$2 per share that do not close below $1 per share during the Pilot and that have an unlimited duration or a duration beyond the end of the post-Pilot Period.</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td><strong>Number of NMS stocks</strong></td>
</tr>
<tr>
<td>Test Group 1</td>
<td>730</td>
</tr>
<tr>
<td>Test Group 2</td>
<td>730 (plus appended Canadian interlisted stocks).</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pilot Securities not in Test Groups 1 or 2.</td>
</tr>
</tbody>
</table>

2. Exchange Transaction Fee Summary.  
3. Order Routing Datasets.

**II. Discussion of Rule 610T**

In response to its proposal to conduct a Transaction Fee Pilot in NMS stocks (the “Pilot”), the Commission received a number of comment letters from a diverse group of commenters, including exchanges, investment managers, broker-dealers, and other market participants, as well as academics, listed issuers, analytics firms, market observers, and industry associations. As discussed below, after review and consideration of the comments received, the Commission is adopting Rule 610T with certain modifications from that in the proposal.

**A. Focus on Exchange Pricing Models and the Effects They Can Cause**

1. Exchange Fee Models and Regulatory Framework

Regardless of the fee model, all fees of a registered national securities exchange “exchange”) are subject to the standards and process requirements set forth in the federal securities laws. In particular, Section 6 of the Exchange Act requires, among other things, that the rules of an exchange provide for the “equitable allocation” of “reasonable” fees and that they not be “designed to permit unfair discrimination.”  


7 Under the Exchange Act, exchange fee changes 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). The Commission may, within 60 days after an exchange filed its fee change
to quotations for and transactions in securities, and the practicality of and the costs of raising their fees substantially in an attempt to take improper advantage of strengthened protection against trade-throughs and the adoption of aprivate linkage regime. In particular, the fee limitation is necessary to address "outlier" trading centers that otherwise might charge high fees to other market participants required to access their quotations by the Order Protection Rule. It also precludes a trading center from charging high fees selectively to competitors that have occurred in the market for Nasdaq stocks. 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; so not only might the next level until someone routed an order to take out the displayed price at the outlier market.11

In light of the considerable debate surrounding exchange fee models that pay rebates, which is well documented in the comment letters submitted on the proposed Pilot, and the passage of time since the Commission first adopted the Rule 610(c) fee cap as part of Regulation NMS in 2005, the Commission now seeks to gather data to facilitate an empirical understanding of the effect of exchange transaction fees and rebates broadly—incorporating and continued appropriateness of the Rule 610(c) fee cap12—by testing the effects of changes to exchange fees and rebates on the markets and market participant behavior.

2. Impact of Exchange Fee Models

In response to the Proposing Release, the Commission received a number of comment letters criticizing existing fee- and rebate pricing models, but also a number of comment letters expressing support for those same pricing regimes.13 Many commenters focused on potential distortions—whether current pricing models "present brokerage-dealers with a potential conflict of interest," because their "duty to pursue best execution could be compromised when their trading venue decision is driven by the economic incentive to minimize access fees paid and maximize rebates received." 14 As another commenter explained, "a broker is incentivized to route an order to the venue that pays it the most for its costs the least," instead of the venue that has the highest likelihood of offering the best execution for its customers, such as the one that offers a higher probability of execution or meaningful price improvement." 15 As evidence of the potential harm that can result from the conflicts presented by exchange rebates, one commenter noted that institutional investors "that specifically instruct brokers to remove rebate-driven trading behaviors from their algorithms achieve significantly lower trading costs that result in higher returns to their investors." 16 One commenter attributed this harm to the tendency of rebates to "aff ect the length of the order queue of passive limit orders on the major maker-taker exchanges, while high take fees on these markets make them less attractive for marketable orders that cross the bid-ask spread." 17 The commenter argued that the "net result of this perverse pricing dynamic is a lower likelihood of execution and a higher likelihood of adverse selection for orders in the maker-taker queues," because orders at the "middle or back of the queue . . . are less likely to trade at their desired price, and when they do trade, the overall market price as re flected by the [National Best Bid and Offer ("NBBO")] is more likely to move against them, than when trading on venues that do not pay rebates." 17

A number of commenters discussed other potential effects of exchange pricing models. Some commenters believed that transaction fees and rebates contribute to market fragmentation18 because they encourage investors to "turn to inverted markets to improve queue or price protection" 19 or to "route orders to non-exchange trading centers to avoid the higher access fees that exchanges charge to subsidize the rebates they offer." 20 Likewise, one commenter thought that "transaction fees and rebates contribute to market complexity through the proliferation of new order types . . . designed to exploit different transaction pricing models." 21 Other commenters believed that "[t]ransaction fees and rebates . . . undermine market transparency because the prices displayed by exchanges—and provided on trade reports—do not include fee or rebate information and therefore do not fully reflect net trade prices." 22 Finally, some commenters

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17 At the time of its adoption in 2005, the fee cap modified the then-prevailing fee level set through contract trading in trading centers. See NMS Adopting Release, supra note 10, at 37453 (stating that "the $0.003 fee limitation is consistent with contract trading practices, as very few trading centers currently charge fees that exceed this amount").

18 The potential distortions mentioned by the commenter (also discussed in this section) include, among others: (1) Conflicts of interest faced by routing broker-dealers; (2) excess intermediation and potential adverse selection; (3) market fragmentation; (4) exchange fee avoidance; (5) complexity; (6) transparency; and (7) elevated fees to subsidize rebates.

19 Capital Group Letter, at 2. See also, e.g., ICI Letter I, at 2; Vanguard Letter, at 2; Invesco Letter, at 2; State Street Letter, at 7; Federal Reserve/Janet L. Yellen, at 1; and Larry Harris Letter, at 3.

20 Healthy Markets Letter I, at 5. See also, e.g., Copeland Letter, at 1; Wellington Letter, at 1; Norges Letter, at 2.

21 Babelfish Letter, at 1-3 (also referencing a Clearpool Group study that found that a "fee sensitive VWAP algorithm executed during volatile times incurred seven times as much cost as a fee agnostic strategy"). See also 7, Bovesca Letter, at 2 (stating that "[ detailing orders ... are generally placed on the exchange that offers the highest rebate to the broker, but show a lower execution quality in terms of reduced probability of execution"); Capital Group Letter, at 2 ("Our internal trade analysis suggests that execution quality may have negatively impacted when broker-dealers' routing decisions are made to minimize access fees.").

22 IEX Letter I, at 2. See also, e.g., Vanguard Letter, at 2 (indicating that the "desire to minimize rebate revenue and avoid fees created order complexity within the equity markets as traders sought profitable trading strategies"); IEX Letter I, at 3 ("Excessive take fees ... have been criticized as leading to the migration of some order flow to less-regulated non-exchange venues in search of reduced transaction costs, resulting in increased market fragmentation and market complexity.").

23 IEX Letter I, at 2. See also, e.g., Vanguard Letter, at 2 (indicating that the "desire to minimize rebate revenue and avoid fees created order complexity within the equity markets as traders sought profitable trading strategies"); IEX Letter I, at 3 ("Excessive take fees ... have been criticized as leading to the migration of some order flow to less-regulated non-exchange venues in search of reduced transaction costs, resulting in increased market fragmentation and market complexity.").
asserted that current pricing models unfairly subsidize rebates or benefit sophisticated market participants like market-makers and proprietary traders at the expense of other market participants. Other commenters expressed support for current exchange pricing models. For example, one commenter believed that maker-taker pricing “provides important benefits to issuers and investors,” because exchanges “use rebates as a tool to promote displayed liquidity and price discovery, which results in competitive bid-ask spreads, saving transaction costs that investors may otherwise incur.” Another commenter argued that rebates can promote displayed liquidity by providing “a payment in exchange for posters of liquidity giving up several valuable options,” including “the power to decide the time of the trade” and the ability to conceal trading intentions until the point of execution. Building on this idea, one commenter characterized “[a]ccess fee caps and related rebates” as features that “enable exchanges to compete with non-exchange trading venues by essentially subsidizing the posted prices . . . and narrowing the NBBO, making it slightly more expensive to either match or improve upon those prices off-exchange.”

As commentators fundamentally disagreed about the effect of exchange transaction fee models and whether they have a positive or a negative impact on the U.S. equities markets, commenters also held conflicting views regarding whether and how the Commission should conduct the Pilot.

3. Focus on Exchange Fee Models

Recognizing the unique regulatory framework applicable to exchange fees, and the disagreement over the impact of exchange fees and rebates on the markets and market participants, the Commission focused its proposed Pilot on studying the effect of exchange transaction fees and rebates on order routing behavior, execution quality, and market quality. Accordingly, the Commission proposed to include within the Pilot all equities exchanges regardless of fee model.

A large number of commenters supported applying the Pilot to all equities exchanges. For example, one commenter believed that the Pilot “should include all equities exchanges . . . because rebates of any kind provide inducements to trade and distort markets.” A different commenter thought that including maker-taker exchanges was “both logical and feasible, given that all equities exchanges assess fees that are subject to the Exchange Act and its rule filing requirements.” Other commenters “agreed with the Commission’s assessment that the Pilot should apply to all equities exchanges . . . thus treating all similarly situated exchanges equally,” because this would be “critically important in determining what impact the reduction of access fees or the elimination of rebates will have on order routing practices.” Some other commenters, however, opposed including maker-taker exchanges in the

Pilot, noting that Rule 610(c) does not apply to maker-taker exchanges.

After considering the comments on this issue, the Commission continues to believe that focusing the Pilot on equities exchanges regardless of fee model is appropriate because it treats alike similarly situated entities that are all subject to the same regulatory framework and thereby will allow the Commission to evaluate the effect of exchange fee-and-rebate pricing models and the continued appropriateness of the Rule 610(c) fee cap. Further, it would be incongruous to study rebates and fees offered by one type of equities exchange (maker-taker), but not another type of equities exchange (taker-maker) where the fees of both types of entities are subject to the same legal requirements and can introduce the same types of distortions that the Pilot seeks to study.

4. Non-Exchange Trading Centers

As proposed, the Pilot would exclude non-exchange trading centers such as alternative trading systems (“ATSs”). Several commenters opined on this aspect of the proposal. A number of commenters agreed with the Commission’s proposal to exclude non-exchange trading centers from the Pilot. Some of those commenters noted that exchanges are subject to various fee-related regulatory provisions that are entirely inapplicable to non-exchange trading centers. For example, one commenter noted that non-exchange trading centers are not currently subject to any access fee caps, and including such trading venues in the Pilot “would have the unintended and harmful effect of unnecessarily regulating ATS business models . . . .”

In addition, several commenters emphasized the fundamental ways in which the fee structures employed by

*See, e.g., Cboe Letter, at 28.*

*See Proposing Release, supra note 2, at 13014.*

As discussed in the Proposing Release, the term “trading center” as used there and throughout this release is a collective term that refers broadly to the venues that trade NMS stocks. See id. at 13009 n.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 without charge with reference to the national best bid and offer.

*See, e.g., Brandes Letter, at 2; AJO Letter, at 2; MFA Letter, at 2; BIDS Letter, at 1–2; BlackRock Letter, at 1; SIFMA Letter, at 5; Virtu Letter, at 6; Fidelity Letter, at 10; Citi Letter, at 2; Clearpool Letter, at 4–5; Luminox Letter, at 1; Morgan Stanley Letter, at 3 n.3.*
non-exchange trading centers are different from the fee models utilized by the equities exchanges and, as a result, concluded that excluding non-exchange trading centers was appropriate. For example, one such commenter explained that “inducements (low fees, no fees, rebates) offered by ATSs and other off-exchange venues are not universal across all broker-dealers or market participants. Instead, the fees paid for access vary among market participants to ATSs and other off-exchange venues are negotiated between each market participant and the trading venue,” such that “the number of fee permutations and inconsistencies across brokers for any single ATS could be substantial.” Still other commenters believed that excluding non-exchange trading centers from the Pilot was appropriate because “ATSs are not protected venues, and thus free market competition among them constrains their pricing power.” One commenter supported excluding ATSs because “there is nothing to be gained by including venues that don’t have the same underlying issues that exchanges present with their rebate and ‘maker-taker’ pricing models.”

On the other hand, other commenters expressed concerns with omitting non-exchange venues from the Pilot. One commenter argued that by excluding non-exchange venues, the Pilot data would be incomplete. For example, one commenter believed that excluding non-exchange venues “could create an imperfect picture of the overall impact of the transaction fees put in place under the Pilot program” and could compromise the value and utility of the data collected during the Pilot. Another commenter argued that by excluding non-exchange venues, the Pilot will not return “meaningful data upon which to make informed analysis and conclusions” because it would “ignore off-exchange trading representing approximately 39 percent of total U.S. equities market trading.” This commenter further believed that the Pilot would be unable to properly assess the potential conflicts of interest because it will not know “the baseline for remuneration occurring off-exchange, or know what impact the Proposal has on that baseline[.]” One commenter objected to excluding ATSs “based on the fact that the proposed Pilot is a ‘new regulatory regime’ for ATSs . . . .”. While one commenter recognized the complexity involved with subjecting non-exchange trading centers to the access fee cap under Rule 610(c), it argued that such complexity did not provide a sufficient basis to treat exchanges and non-exchange trading centers disparately. A few commenters recommended excluding ATSs, but requiring them to submit the required order routing data.

The Commission believes that excluding non-exchange venues from the Pilot should not negatively impact the Pilot’s data or impact its results. As noted above, the Pilot is designed, among other things, to study the effects of exchange fee models. Because exchange fee models are materially different both in their structure and regulatory treatment, the potential effects that may be associated with exchange fee models are not applicable in the same manner to ATSs. Similarly, the question of whether rebates narrow the quoted spread is inapplicable to ATSs, which do not publicly display an automated quotation. Further, ATS activity is not being overlooked as increases or decreases in ATS volume during the Pilot will be reflected in other existing data sources. Accordingly, Commission researchers (hereinafter “researchers”) will be able to assess market-wide changes in order flow during the Pilot.

Further, even if non-exchange venues provided order routing data pursuant to the Pilot, research should be unable to meaningfully correlate changes in an ATS’s order flow with the fees of that ATS because those fees are bespoke, typically bundled, and are not as transparent as exchange fees. Exchange fees are not only fully transparent in published fee schedules, but exchange fee changes must be filed with the Commission and thus they have a precise effective date attached to each filing. This level of transparency for exchange fees and rebates, which is not present for ATSs, is an important component facilitating researchers’ ability to draw causal connections with the Pilot’s results. While obtaining order routing data from ATSs might provide interesting insight into their business, it could not be meaningfully correlated with ATS fees and fee changes and is not necessary to study the Pilot’s results. Rather, existing sources of data on ATS activity, including data published by the Financial Industry Regulatory Authority (“FINRA”), will permit researchers to observe changes in ATS activity during the Pilot.

Among commenters critical of excluding non-exchange venues, some believed it could raise competitive issues to apply the Pilot’s pricing limitations to the equities exchanges, but not impose the same pricing limitations on non-exchange trading centers that trade the same equities securities. One exchange commenter found it “inexplicable[ ]” that the Pilot focuses only on exchanges and entirely ignores off-exchange venues, when those are the venues that are most likely to benefit from a pilot that pointedly decreases the incentive (i.e., rebates) to post protected quotes on-exchange.

Several commenters suggested that the exclusion of non-exchange trading centers from the Pilot could “create incentives for market participants to move more order flow to off-exchange platforms,” thereby putting national securities exchanges at a competitive disadvantage as compared to off-exchange trading centers. However, a equitable exchanges charge transaction-based fees, non-exchange trading centers may not charge separate transaction-based fees, but instead may bundle pricing such that a particular order is not necessarily associated with a particular fee. See, e.g., Morgan Stanley Letter, at 3 n.5 (stating that “many broker-dealer[ ] operators of ATSs generally charge clients an overall commission rate (rather than an access fee) for a bundle of services, including access to their ATS’s[ ]”)

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28 See, e.g., Morgan Stanley Letter, at 3 n.5 (stating that “many broker-dealer[ ] operators of ATSs generally charge clients an overall commission rate (rather than an access fee) for a bundle of services, including access to their ATS’s[ ]”); BDS Letter, at 1-2; AJO Letter, at 2; Healthy Markets Letter I, at 10.
29 AJO Letter, at 2.
30 CitI Letter, at 2. See also, e.g., Fidelity Letter, at 10 (stating that “ATS fee structures are already subject to competing market forces and are more complex pricing models than exchanges[,] making their participation in the Proposed Pilot less useful”); SIFMA Letter, at 5 (opining that “competitive forces already push access fees [at ATSes] to an appropriate level . . . lower than the access fees charged by exchanges,” because “ATS access fees ‘are included in the total cost consideration of trading’”)
31 Luminex Letter, at 1.
33 See Wellington Letter, at 2 (acknowledging, however, that “the practicality for the Commission to include off-exchange venues”). See also, e.g., RBC Letter I, at 4; ProAssurance Letter, at 2.
34 Nasdaq Letter I, at 2, 5-7. See also, e.g., NYSE Letter I, at 2.
35 See Nasdaq Letter I, at 7.
36 See, e.g., Choe Letter I, at 13.
37 See NYSE Letter I, at 7-8.
39 As noted by several commenters, equities exchanges and non-exchange trading centers currently employ different fee models. While
40 See supra notes 310-312 and accompanying text (discussing recent amendments to Regulation ATS and their relevance to the proposed Pilot).
41 See, e.g., ASA Letter, at 3; Choe Letter I, at 12, 26-27; Nasdaq Letter I, at 5-7; NYSE Letter I, at 3-8.
42 See Choe Letter I, at 12. See also Nasdaq Letter I, at 6; NYSE Letter I, at 3-5; NYSE Letter II, at 12.
43 See, e.g., Wellington Letter, at 2; Oppenheimer Letter, at 3; Angel Letter II, at 2; Nasdaq Letter I, at 7; Choe Letter I, at 12; Shutterstock Letter, at 5; Curtis-Wright Letter, at 1; ASA Letter, at 3.
centers for order flow, exchange fees and the fees of non-exchange trading centers are treated very differently under the federal securities laws. Indeed, one of the distinguishing features of registered national securities exchanges is that—unlike non-exchange trading centers—their fees are subject to the principles-based standards set forth in the Exchange Act, as well as the rule filing requirements thereunder. In particular, the federal securities laws require the entirety of each and every fee, due, and charge assessed by an exchange to be transparent and publicly posted for all to see, and must be an equitable allocation of reasonable dues, fees and other charges and not be unfairly discriminatory.\textsuperscript{56} On the other hand, similar requirements do not apply to the fees of non-exchange trading centers that do not provide public transparency into their full itemized fee schedules and typically are individually negotiated on a customer-by-customer basis.\textsuperscript{57} By including all equities exchanges regardless of fee model, and excluding other types of trading centers, the Pilot is designed to include all trading centers whose fees are subject to the principles-based standards set forth in the Exchange Act as well as the rule filing requirements thereunder.\textsuperscript{58} Thus, the Pilot will produce data to empirically evaluate 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 Commission believes that subjecting non-exchange trading centers to the Pilot would go beyond the scope of the current regulatory framework that applies only to exchanges and would not further the Commission’s evaluation of the impact of the existing regulatory regime, including, but not limited to, the Regulation NMS fee cap, which applies exclusively to exchange fees and rebates. In effect, the Pilot will help the Commission carry out its statutory responsibility to assess the effect of exchange fees and rebates, which do not apply to non-exchange trading centers.\textsuperscript{59}

5. Options Exchanges
Finally, the Commission proposed to exclude options exchanges from the Pilot, because options and equities are materially different types of securities. In addition, the access fee cap under Rule 610(c) does not currently apply to the options exchanges.\textsuperscript{60}

Several commenters agreed with the Commission’s exclusion of the options exchanges.\textsuperscript{61} No commenters suggested that the Commission include options markets in the Pilot. For the reasons noted above and discussed in the Proposing Release, the Commission is not including options markets within the scope of the Pilot.\textsuperscript{62}

B. Securities
As proposed, all NMS stocks\textsuperscript{63} that meet specified initial and continuing minimum standards would be eligible for inclusion in the Pilot (collectively, “Pilot Securities”).\textsuperscript{64} The Commission received a number of comments regarding the scope of Pilot Securities to be included in the Pilot.

1. The Share Price Threshold of Pilot Securities
The Commission proposed that an NMS stock must have a minimum initial share price of $2 at the time the pre-Pilot Period commences to be included in the Pilot and that any Pilot Securities that close below $1 at the end of the trading day during the proposed Pilot would be removed from the Pilot.\textsuperscript{65}
One commenter opposed the $2 initial minimum share price threshold as overly restrictive.\(^{66}\) Other commenters, however, agreed that the securities in the Pilot should have an initial minimum $2 per share price threshold at the time of the initial stock selection, because this threshold "will capture virtually all NMS stocks while minimizing the risk that securities will drop out of the Pilot . . . ."\(^{67}\) One of these commenters believed that proposed thresholds would "help ensure consistency among the Test Groups and limit the risk of data anomalies due to changes in the composition of those groups."\(^{68}\)

Another commenter noted that the choice of "$2 and $1 thresholds . . . follows the reasonable parameters established during [the] . . . Tick Size Pilot" and asserted that the "determination to pull out securities that close at under $1 during the pilot seems appropriate, especially given the fundamentally different fee structures applicable to stocks with prices less than $1.00."\(^{69}\)

The Commission continues to believe that the proposed share price thresholds for Pilot Securities are appropriate. The Commission notes that no commenters opposed the proposed $1 minimum continuing price threshold, which will exclude such stocks from the Pilot because stocks with quotations of less than $1 are subject to different regulatory and fee treatment.\(^{70}\) The Commission continues to believe that an initial $2 share price threshold will best balance the need to include a broad set of NMS stocks in the Pilot with the desire to ensure that substantially all of the securities selected at the outset of the Pilot remain part of their respective Test Groups throughout the duration of the Pilot, including during the pre- and post-Pilot periods. The Commission does not believe that the $2 threshold is overly restrictive because, as discussed in the Proposal, it is uncommon for securities priced at $2 or more to fall below $1.\(^{71}\) Lowering the initial stock selection threshold below $2 could increase the likelihood that securities selected for the Pilot get dropped from the Pilot if their share price closed below $1 during the Pilot. Such a result would change the composition of the Test Groups during the Pilot, which might adversely impact the quality of the data produced by the Pilot. For these reasons and others discussed in the Proposing Release, the Commission adopts as proposed the share price thresholds set forth in Rule 610T(b)(1)(i).

2. The Duration of Pilot Securities

The Commission proposed that, in order to be included in the Pilot, an NMS stock must have an unlimited duration or a duration beyond the end of the post-Pilot period in order to be included in the Pilot.\(^{72}\) No comments were received regarding this condition. For the reasons outlined in the Proposing Release, the Commission adopts this aspect of the Pilot as proposed.\(^{73}\)

3. Selecting Pilot Securities From All NMS Stocks

The Commission proposed to select Pilot Securities from among the entire universe of NMS stocks, subject to the minimum share price threshold and duration requirements. As proposed, the Pilot would include a broad and diverse cross-section of securities, including, for example, stocks of all market capitalizations as well as ETPs.

The Commission received comments on the universe of Pilot Securities that generally fell into four categories:

1. The inclusion of stocks with market capitalizations below $3 billion, (2) the inclusion of ETPs, (3) the inclusion of Canadian interlisted stocks, and (4) the inclusion of NMS stocks other than stocks of operating companies and ETPs. Each of these points is discussed below.

a. Market Capitalization and Liquidity

The Commission proposed to select Pilot Securities from among NMS stocks of all market capitalizations.\(^{74}\) A few commenters recommended that the Pilot exclude securities with smaller market capitalizations and/or thinly-traded securities. One commenter suggested that the "majority of securities within the Test Groups should be more liquid" and that thinly-traded securities, if included, "should be a minority of all securities in the Test Groups."\(^{75}\) Similarly, one exchange commenter stated that the Pilot "should exclude less active stocks as the liquidity in which stock will likely be negatively impacted by this Pilot."\(^{76}\) This commenter asserted that "[l]ess active stocks are highly dependent on professional liquidity providers to post liquidity" and speculated that "[d]ecreasing incentives for liquidity providers to post liquidity in less active stocks will have a pronounced impact on liquidity . . . manifest[ing] in significantly wider spreads and significantly less liquidity for securities."\(^{77}\) Noting that "many industry participants appear to advocate for increased incentives for liquidity provision in thinly-traded stocks," the commenter did not believe that the Pilot's goals were "worth the risk to liquidity and capital formation that the Commission itself identifie[d]."\(^{78}\)

Another commenter was similarly concerned that the Pilot would "have a significant impact on small to medium issuers since exchanges will not be able to provide incentives to market makers to support trading in those companies' securities."\(^{79}\) This commenter stated that "[l]iquidity rebates can be critical for such securities to motivate market makers to support the stock with aggressive and actionable quotations."\(^{80}\) Further, the commenter opined that the Pilot would "risk damaging companies' ability to efficiently raise capital," which it believed would "particularly harm small and medium sized companies, for which the current market structure is already not

\(^{66}\) "minimum initial share price of at least $2 . . . ." As adopted, this language refers to the "minimum initial share price of at least $2" to delete redundant text. In addition, as proposed, Rule 610T(2)(b)(1)(ii) explained that a Pilot Security that closes below $1 would 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)." As adopted, this language is being modified slightly to make it more concise. Accordingly, as adopted, this language provides that if the share price of a Security closes below $1 at the end of the trading day "it will be removed from the Pilot."\(^{67}\)

\(^{67}\) See also Angel Letter I, at 2.

\(^{68}\) RBC Letter I, at 5. See also, e.g., Better Markets Letter I, at 6; Healthy Markets Letter I, at 11-12.

\(^{69}\) RBC Letter I, at 5.

\(^{70}\) Healthy Markets Letter I, at 12.

\(^{71}\) See Proposal Release, supra note 2, at 13017.\(^{72}\) See id. at 13017 n.102 (noting that only 4.3% of publicly traded common stocks and ETPs with a share price above $2 during 2012-2016 dropped below $1 in that period).

\(^{73}\) See Proposing Release, supra note 2, at 13017; Proposed Rule 610T(b)(1)(ii).

\(^{74}\) See Proposal Release, supra note 2, at 13018 n.103.

\(^{75}\) See id. at 13018. The EMSC's recommendation was to limit a pilot to stocks above $3 billion in market capitalization in order to avoid overlap with the Tick Size Pilot. See id. The Commission notes, however, that the Tick Size Pilot ended on September 26, 2018 and the Pilot Period for the Transaction Fee Pilot will not start before the post-pilot period for the Tick Size Pilot ends on April 2, 2019. See Section II.C.3. infra.

\(^{76}\) See also, e.g., Morgan Stanley Letter, at 4; Leaf Letter, at 1.

\(^{77}\) See also, e.g., Harris Letter, at 1; T. Rowe Price Letter, at 4.

\(^{78}\) Choo Letter I, at 28.

\(^{79}\) Id. See also, e.g., Morgan Stanley Letter, at 4.

\(^{80}\) See also, e.g., Proposition Release, supra note 2, at 13069.

\(^{81}\) Nasdaq Letter I, at 8-9.

\(^{82}\) Id. at 3, 9 (alleging that the Pilot was "arbitrary and capricious and not in accordance with law," because it gave "less depth to these concerns"). See also Virtu Letter, at 7 (expressing concern that the Pilot would "harms investors in . . . less liquid ETPs, which will be faced with less liquidity and wider spreads when they seek to sell their holdings").
optimized." The commenter further argued that "incentives (rebates) are important to creating two-sided markets across all stocks, especially thinly traded stocks." Many other commenters supported including a broad scope of Pilot Securities. For example, a group of twenty-one asset managers submitting a joint letter stated that "[a]ny NMS stocks as possible should be in scope, including those with market capitalizations below $3bn," in order to create a "meaningful" dataset. Another commenter agreed that the Pilot "should encompass the broadest universe of securities, as is feasible, in order to maintain the sample size and provide the most robust dataset possible," further arguing that "[o]mitting securities of a specific market cap size is arbitrary, would provide an incomplete view of the overall market, and runs the risk of excluding meaningful data and biasing the study." Building on these arguments, other commenters believed it was important to specifically test the argument that rebates are required to promote liquidity provision in illiquid stocks. One commenter noted that this debate "has raged for years," which is "the point of the pilot: To provide market participants and the Commission with the data needed to make those analyses." Another commenter similarly asserted that the Pilot should include a broad set of NMS stocks to "help settle academic debates on the relative impact of rebates on liquid vs. less-liquid stocks and other supposedly beneficial aspects of rebates." 

Notably, some of these commenters directly challenged the argument, set forth by a number of other commenters, that thinly-traded or smaller-capitalization NMS stocks would be harmed by the Pilot’s pricing restrictions. One commenter explained that, "for less liquid stocks, spreads tend to be wider, and as a result rebates become less relevant as a matter of simple mathematics." To illustrate the point, the commenter referred to a "stock that typically trades at a five-cent quoted spread," noting that a "typical .0025 per share rebate would equal one-twentieth of the quoted spread, so in these instances a market maker’s revenue from capturing the spread would far outweigh the contribution of the rebate" (emphasis in original). Another commenter also questioned the "significance of liquidity rebates for making markets in less liquid/smaller-cap stocks," because it believed this "marginal incentive to provide liquidity is like to be smaller in the smaller-cap space typically characterized by wide bid-ask spreads. . . . To support this argument, the commenter referred to "an empirical study of changes in maker-taker arrangements on two European trading venues owned by BATS," now owned by Cboe Global Markets, which suggested that "an elimination of the maker fee and a reduced take fee cap would result in worse market quality for large capitalization stocks but better market quality for small capitalization stocks" (emphasis in original). For this reason, the commenter asserted that "the link articulated by the opponents of the proposed pilot is at best uncertain and that the pilot may in fact result in improved liquidity for smaller-cap

Impacts of transaction fees on market quality across various types of securities."

As discussed further below, notwithstanding the decision to include all NMS stocks regardless of market capitalization, the Commission believes it is appropriate to exclude certain thinly-traded securities (e.g., securities that trade fewer than 30,000 shares per day), in part because rebates at that level of trading would be low enough to be unlikely to impact order routing behavior and researchers would be unlikely to get sufficient statistical power to analyze them in isolation at those volume levels.
b. The Inclusion of ETPs

The Commission proposed to select Pilot Securities from among all NMS stocks, including ETPs. A number of commenters supported including ETPs in the Pilot. Several commenters noted, for example, that including ETPs “would produce a more inclusive analysis of rebates and fees across all segments of NMS stocks.” One such commenter believed that “the benefits from collecting data that informs long-term market structure improvements will outweigh any potential temporary disadvantage.” On the other hand, a number of commenters expressed concern with including ETPs in the Pilot. For example, one commenter stated that “[m]any ETP issuers are . . . strongly opposed to the inclusion of ETPs in the Pilot” and suggested that the Commission had not “sufficiently explained why it is appropriate to include ETPs in any Pilot.” This commenter noted that “exchanges have implemented numerous incentive structures designed to promote liquidity and narrow spreads in ETPs” that could be disrupted by the Pilot, “negatively impact[ing] liquidity and spreads in ETPs to the detriment of both new and existing investors.” Similarly, another commenter expected the Pilot to “result in spreads widening for ETPs holding pilot stocks, even if ETPs are not included in the pilot, given that fair value calculations rely on underlying constituent pricing,” and therefore cautioned that “any negative effects of the pilot on transaction costs could be intensified for ETP investors.” A few commenters “believe[d] that the goals of the pilot can be achieved without having to include ETPs in the pilot,” because “[t]he effects of the pilot on stocks will be sufficient to draw conclusions about potential changes to access fee rules.”

The Commission continues to believe that it is important to include ETPs in the Pilot, because excluding them would hamper the Commission’s ability to gather key data that could be used to inform future regulatory action in this area. The Commission does not believe it will be able to draw meaningful conclusions about the impact of changes to transaction fees and rebates on ETPs by observing the effects of the Pilot on other securities, in part because ETPs have a unique create-and-redeem process that does not apply to other NMS stocks. Nevertheless, ETPs are subject to the same rules and fees that apply to all NMS stocks. To the extent that the Pilot results may inform future policymaking, Pilot data that includes all types of NMS stocks that would be impacted, including ETPs, will be more useful.

Further, some commenters expressed concern regarding the potential for competitive effects among certain ETP issuers. As one commenter noted, “if two ETPs with similar underliers or that track the same index are placed in the two different [T]est [G]roups, the Pilot would inevitably determine winners and losers.” Another commenter explained that “ETPs with similar investment strategies are more substitutable than stocks of operating companies,” such that “market quality metrics likely play a greater role in driving flows to ETPs.” For that reason, “[i]f competing ETPs are in different test groups—and market quality varies among the test groups,” the commenter believed that “investors might migrate toward products in the test groups with better market quality,” thereby “tilting the playing field in favor of ETPs assigned to be assigned—at random—to test groups that perform better at the expense of other products.”

While a few commenters discussed which treatment group would be most problematic, many of the commenters took no position on the direction of the presumed competitive impact and did not speculate about how (or whether) inclusion in specific Pilot Groups would help or harm ETPs.

To address the potential competitive harm, a few of these commenters recommended that the Commission exclude ETPs from the Pilot altogether, while most recommended that the Commission select ETPs in a manner that may avoid any potential competitive effects among similar ETPs, by: (1) Rotating all of the Pilot Securities through the various treatment groups; (2) rotating only ETPs through the various treatment groups; or (3) placing in the same Test Group ETPs tracking similar indexes or holding similar investments.

Other commenters criticized these proposed alternatives for selecting ETPs. One commenter, for example, questioned “whether any of the proposed remedies would address these concerns effectively or fairly.” Another commenter expressed concern that the suggestions to place “similar” ETPs in the same Test Group might be too complex to implement, as determining whether ETPs are “similar” to one another for purposes of Pilot rotation can be extremely nuanced. This commenter explained that “effective classification should take into account an ETP’s underlying index, portfolio constituents and asset class to provide an appropriate ‘apples to apples’ analysis,” in addition to “factors such as assets under management, spread size and daily trading volume,” which the commenter believed “would
introduce unnecessary complexity into the Proposal." 115

The Commission recognizes the concern that securities placed in one treatment group could be impacted differently than similar securities placed in a different treatment group. While that effect could occur for any security (e.g., stocks of different operating companies in the same industry), it could potentially be more prominent for ETPs that may be substantially similar. Nevertheless, the Commission notes that similar ETPs are not necessarily identical and many other factors influence investor demand and trading, including expense ratios, trading commissions, and existing holdings. The Commission has carefully considered the three alternatives suggested by the commenters 116 and declines to adopt them. Rotating either (1) all Pilot Securities or (2) only ETPs would increase complexity and could increase the costs of the Pilot as the Commission, exchanges, and market participants would need to manage a pilot whose securities change treatment groups every several months. In particular, a rotation design would be considerably more complex than the proposed design by, for example, adding more treatment subgroups and requiring frequent rotation of those subgroups. Given the choice between a simple Pilot design with a short duration, on one hand, and a considerably more complex design with a longer duration, on the other hand, the Commission prefers to adopt this aspect of the rule as proposed. Compared to the alternative designs suggested by some commenters, the proposal results in a short narrowly drawn pilot with fewer complexities and burdens, which is an outcome supported by many commenters. 117

The Commission also considered the suggestion to group ETPs with similar underlying holdings into the same treatment group. While this suggestion involves slightly less ongoing complexity than rotating securities during the Pilot, the Commission declines to adopt this suggestion because it introduces its own complexity in that categorizing ETPs according to their underlying holdings (and potentially other characteristics) involves the exercise of subjective judgment. In addition, grouping similar ETPs can negatively impact the representativeness of the different treatment groups, particularly if all of the similar ETPs are similar in volume, price, and market capitalization. The Commission believes it may learn more from a study that compares how different pricing regimes affect similarly-situated ETPs, whereas keeping similar ETPs in the same treatment groups could reduce the quality and usefulness of Pilot's results by inhibiting the ability of researchers to compare treatment groups. While the potential exists that similar ETPs in different Pilot treatment groups might trade differently during the Pilot, it is not certain—and commenters held divergent views concerning—whether and to what extent the Pilot would be a contributing factor. Whether the absence of rebates or increased fees help or hurt trading in similar ETPs is far from certain, and whether investors would base trading decisions on those distinctions is unclear. Excluding ETPs to avoid speculative harm would, however, decidedly reduce the utility of the Pilot's results to inform future policy making. Therefore, the Commission has determined not to adopt a requirement to rotate securities or group like ETPs. For these reasons, the Commission adopts the rule as proposed to include ETPs in the Pilot.

c. The Inclusion of Canadian Interlisted Stocks

In the Proposal, the Commission requested comment on the selection criteria and whether the Commission should consider inclusion or exclusion of certain stocks from the Pilot sample set. 118 In response, several commenters discussed the inclusion of Canadian interlisted stocks in the Pilot and recommended that the Commission coordinate with Canadian securities regulators to avoid altering the trading dynamics between Canada and the U.S. in those securities. 119 For example, one commenter was "concerned that the inclusion of Canadian interlisted stocks in either one of the reduced access fee or no rebate test groups may materially impact order flow by encouraging transactions to move away from U.S. exchanges and on to Canadian exchanges." 120 Other commenters suggested that the Commission coordinate with the Canadian Securities Administrators to avoid "dramatic differences in the trading economics on inter-listed securities between Canadian and U.S. markets." 121

The Commission also received a comment letter from the academics retained by the Canadian Securities Administrators ("CSA") to assist with planning, conducting, and analyzing a Canadian transaction fee pilot ("Canadian Pilot"). 122 According to the CSA researchers, the Canadian Pilot will propose to inter-list approximately 180 interlisted stocks, 90 of them would be included in a no-rebate test group with the remaining 90 placed in a control group. 123 In their letter, the CSA researchers requested that the Commission's Pilot treat interlisted stocks similarly to their Canadian Pilot proposal—i.e., that both pilots place the same 90 interlisted stocks into their respective no-rebate group and place the other 90 stocks into their respective control group. 124 By doing so, the CSA researchers believe that both pilots will avoid confounding the analysis for each respective pilot with respect to interlisted stocks because differences in fees and rebates otherwise could incentivize shifts in cross-border routing. 125

The Commission agrees with the CSA researchers and believes that it is appropriate to coordinate with the CSA on a transaction fee pilot in order to avoid the potential for distortory effects between U.S. and Canadian markets if rebates in the "no-rebate" interlisted stocks continue to be allowed on one country's exchanges but not the other. Accordingly, in the event that the CSA proceeds with the Canadian Pilot concurrently with the Commission's Pilot, the Commission will append to the no-rebate Test Group the same Canadian interlisted stocks that the CSA selects for its no-rebate treatment group and the remaining interlisted stocks will
be placed into the Control Group. Placing the same interlisted stocks into the Pilot's no-rebate test group that the Canadian Pilot places into its no-rebate test group will avoid the potential to alter the trading dynamics between Canadian exchanges and U.S. exchanges in those stocks that otherwise could result if not all exchanges were subject to the same conditions, which should support the integrity of the no-rebate test groups in both pilots. Coordination also will avoid the potential for the Commission's Pilot to interfere with the ability of Canadian securities regulators to conduct a pilot of their own on Canadian-listed stocks which could be adversely impacted in the absence of coordination. The Commission appreciates the interest expressed by the CSA researchers in coordinating on a pilot with respect to interlisted stocks, and looks forward to cooperating with the CSA on this important data-gathering initiative in a manner that benefits both nations' securities markets.

d. The Inclusion of Other Types of NMS Stocks

A few commenters addressed the inclusion of other types of NMS stocks, such as American Depositary Receipts ("ADRs"), rights, and warrants. One commenter supported the proposed broad scope of Pilot Securities and believed that "analysis of . . . ADRs could provide additional insight into the effect rebates and fees have on liquidity, spreads and the overall trade experience." Another commenter objected to the Commission's proposal to include rights and warrants in the Pilot, but did not explain the basis for its objection. As noted above, however, most commenters expressed general support for a Pilot that includes all NMS stocks.

The Commission continues to believe that it is appropriate to select Pilot Securities from among the overall universe of NMS stocks. Accordingly, the Commission will include all types of NMS stocks in the Pilot, subject to the selection criteria described below. The Commission believes this is appropriate because exchange fees and rebates apply to all NMS stocks, as does the fee cap under Rule 610(c). Aligning the scope of the Pilot with the scope of equities fees and the equities fee cap will best facilitate analysis of the impact of changes to transaction fees and rebates on different segments of the securities market. Excluding from its scope any categories of NMS stocks would deprive the Commission of data to inform future regulatory action regarding this segment of the market. For those reasons, the Commission adopts this aspect of the Pilot as proposed, subject to the selection methodology described below in Section II.C.

4. The Ability of Issuers To Opt Out of the Pilot

The Commission solicited comment as to whether issuers should be allowed to request that their securities not be included in one of the Pilot's Test Groups (i.e., "opt out") and the potential impact that such an approach might have on the extent and quality of the data collected by the Pilot.

Several commenters argued that issuers should be permitted to opt out of participation in the Pilot based on specific concerns surrounding the potential impact of the Pilot. A number of these commenters were listed company issuers that expressed concern about how the Pilot would affect trading in their securities. Commenters

134 Issuer Network Letter I, at 2, 7 (emphasis omitted).
135 ModernIR Email, at 1. See also Issuer Network Letter I, at 7 (suggesting that the Commission "[p]lace the Access Fee Pilot on hold for 90 days while [it] gathers a Blue Ribbon Panel . . . of a dozen or so NYSE and Nasdaq listed company financial executives so that we might conduct a comprehensive review" of the Pilot (emphasis omitted)).
136 The EMSAC held meetings open to the public, which were publicly webcast, as it was developing its recommendations. To promote awareness of those meetings, the Commission issued press releases to announce those meetings, which included the agenda for those meetings. See, e.g., SEC Press Release 2015-216 (announcing the agenda for an October 27, 2015 EMSAC meeting, highlighting the discussion of fees and rebates, and soliciting comments from the public thereon), available at https://www.sec.gov/news/pressrelease/2015-216.html. The Commission also published meeting minutes and transcripts of the full EMSAC meetings. Finally, the Commission provided a mechanism for the public to submit comments to the EMSAC for its consideration, and a number of people did submit comments. See https://www.sec.gov/comments/285-29/285-29.shtml (comment File for File No. 285-29).
137 See, e.g., P&G Letter, at 1; McDermott Letter, at 1; Level Brands Letter, at 1; ACCO Letter, at 1; NorthWestern Letter, at 1–2; Ethan Allen Letter, at 1–2; Unilift Letter, at 1; Johnson Letter, at 1; Sensent Letter, at 2; Hawaii Letter, at 1; Cott Letter, at 1; Leaf Letter, at 1–2; First Majestic Letter, at 1; SFICO Letter, at 1; Tegarden Letter, at 1; Esmus Letter, at 1–2; Trenner Letter, at 1; Generali Letter, at 1;娱乐记者 Letter, at 1; ProAssurance

126 In the event that the Canadian pilot does not go forward or does not commence simultaneously with the Commission's Pilot, interlisted stocks will be placed at the Pilot's outset into the Control Group. Placing interlisted stocks in the Control Group will preserve the status quo for interlisted stocks, and looks forward to cooperating with the CSA on this important data-gathering initiative in a manner that benefits both nations' securities markets.

127 See, e.g., Proposing Release, supra note 2, at 13024 (discussing the design of proposed Test Group 3 and the prohibition in Linked Pricing to support the integrity of a no-rebate test group). See also CSA Letter, at 1 (expressing concern that "the results of the Canadian Pilot may be statistically and economically inconclusive" without coordination with the Pilot).
supporting opt out emphasized the importance of giving issuers the ability to avoid potential costs and uncertainty resulting from the Pilot. For example, one commenter believed that the Pilot could “cause[s] spreads to widen in securities selected for the test groups,” such that “companies conducting a repurchase program or secondary offering would incur higher costs,” and the Commission received a number of comment letters from listed issuers specifically referencing that point and echoing the same concerns. This commenter further argued that “the Proposal would also harm the ability of issuers whose securities are subject to access fee caps to compete” with issuers not subject to the Pilot’s exchange fee restrictions.

Many other commenters opposed opt out. Some of these commenters dismissed the concerns described above regarding the potential costs on issuers whose stock is included in the Pilot. For example, one commenter disagreed with the notion that “rebates are needed to incentivize market makers to quote tight spreads” in the stocks of certain issuers who had submitted comment letters. This commenter explained that the “fifth of a cent rebate is not incentivizing a tight bid-ask spread in these issuers’ stocks,” because that rebate represents an insignificant portion of their average spread. Another commenter disagreed with the suggestion that the Pilot would have a negative impact on issuers, arguing that such position “directly contradicts the public support by investors for the Pilot.” This commenter opined that the “fundamental forces of supply and demand that affect...the relative attractiveness of individual public company stocks will be in no way impaired if...exchanges are precluded from paying a rebate, or required to accept a lower access fee.”

Other commenters asserted that opt out would “adversely affect the quality of the data and the credibility of the Pilot,” which could weaken the findings that could be drawn from it. One commenter explained that opt out “would undercut the ability of economists to draw sharp inferences based upon performance differences between the treated and control stocks” and that the “non-random character of ‘opt outs’ could disproportionately reflect firms that were especially responsive to feedback from the listing exchange or could disproportionately reflect less liquid stocks, which would be especially important for the access fee pilot.”

One listed issuer, which is a large investment manager, “welcome[d] the opportunity for [its] stock to be included in the Pilot, with the ultimate goal of improving the overall market to be one where prices can be set by long-term investors without distortion from speculative market participants.” This issuer did not expect that a reduction or outright removal of rebates will have any significant or harmful effects on the quality of prices displayed in the public lit market, interfere with genuine liquidity and price formation, or negatively impact [its] stock’s trading volume, spread or displayed size.

Finally, two commentators further argued that opt out would be inconsistent with the existing market structure. One of these commentators observed that “[i]ssuers currently have no say over exchanges’ policies” and that “exchanges that modify their access fees dozens of times a year do not survey issuers or permit them to opt-out of these fee changes or creation of order types.” The other commenter opined that opt out “may set an unfortunate precedent that would allow an issuer to pick and choose among those aspects of the National Market System that it likes while rejecting other aspects that it may find less attractive to it, but which are necessary to the smooth functioning of [the] United States public equity markets.”

After careful consideration, the Commission does not believe that issuers should be permitted to opt out of participation in the Pilot. While the Commission understands issuers’ concerns, allowing issuers to opt out could undermine the representativeness of the Pilot’s treatment groups and potentially bias the Pilot’s results, depending on the number and characteristics of issuers that opt out. In turn, researchers would be less able to rely on the data to perform analyses and draw specific conclusions about the impact of the Pilot, thereby limiting the usefulness of the Pilot’s data to the Commission and future regulatory initiatives. Although some commenters believe that issuers may incur potential costs or endure competitive harms depending on which of the Pilot’s treatment groups their stock is in, other commenters have argued that such effects are unlikely to manifest. The Commission does not believe it is appropriate to implement an opt out provision that could frustrate the collection of useful and representative data based solely on concerns expressed by some commenters regarding uncertain harms. It is precisely because of this uncertainty that the Commission believes it is necessary to conduct the Pilot to study these contested issues through an objective empirical review of exchange transaction fees and rebates. For those reasons, the Commission...
adopts this aspect of the Pilot as proposed.

C. Pilot Design

1. Need for a Pilot

As a threshold issue, commenters disagreed about whether the Commission should conduct any kind of pilot study of transaction fees and rebates. One commenter, for example, characterized the proposed Pilot as a “solution in search of problem” and claimed that the Commission “has provided no evidence that existing fee practices are harming investors or interfering with fair competition.”

Another commenter believed that the Pilot was unnecessary, but for the opposite reason—namely, that there is ample evidence of the negative effects of exchange rebate pricing models, such that the Commission should instead take immediate action to ban them.

Most commenters, however, thought a Commission-led pilot was necessary and supported the Commission’s proposal to conduct one. These supportive commenters observed that “market participants have heavily debated the effects that transaction-based fees, particularly access fees, and rebates may have on the equity markets” and “condemned the SEC for advancing this discussion through a time-limited, empirical study.”

Some of those commenters thought a Commission-led pilot was necessary because competitive pressures among exchanges may serve as a barrier to market-led reforms in this area. The Commission agrees with the commenters that stated the Pilot is necessary because, as reflected in the comments discussed above, there is strong disagreement about the impact of exchange-fee-and-rebate pricing models but a lack of data to study the issue. The Commission believes it is important to further investigate these impacts.

2. Pilot Design

For each NMS stock that meets the initial criteria to be a Pilot Security, discussed above, the Commission proposed to assign it to one of three Test Groups, with 1,000 NMS stocks each, or the Control Group. The composition of each Test Group would remain constant for the duration of the Pilot, except, 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.

The Commission received a number of comments on the proposed Pilot design, discussed below, focusing mainly on the number of securities included in each Test Group. After consideration of all the comments received and for the reasons discussed below, the Commission is adopting two Test Groups that each contain 730 NMS stocks, functionally combining proposed Test Groups 1 and 2 into a new Test Group 1 with a blended fee cap of $0.0010. Accordingly, for the duration of the Pilot, the following pricing restrictions will apply to Test Groups 1 and 2, while the Control Group will remain subject to the current access fee cap in Rule 610(c):

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<td>No Rebate Test Group</td>
<td>1,000 NMS stocks</td>
</tr>
<tr>
<td></td>
<td>Rebates and Linked Pricing Prohibited for removing &amp; providing displayed &amp; undisputed liquidity (except for specified market maker activity).</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pilot Securities not in a Test Group</td>
</tr>
</tbody>
</table>

154 Choe Letter I, at 5. See also, e.g., Virtu Letter, at 1–2; Nasdaq Letter I, at 12–13. But cf. MFA Letter, at 2 (stating that "regulators should periodically assess market practices and regulations to ensure that U.S. equity markets continue to remain liquid, fair, resilient and transparent for all market participants.").

155 See Larry Harris Letter, at 9–10.

156 See, e.g., Decimus Letter, at 4 (stating that the Pilot "would be valuable in generating concrete information and more preferable to back-of-the-envelope calculations based on questionable assumptions"); Wellington Letter, at 1 (stating that the Commission could only "draw[] definitive conclusions on the impact of existing pricing models . . . through an actual implementation" of the Pilot); Verret Letter I, at 4 (stating that the Commission "appears to have considered adoption of a mandatory rule to reshape market structure, and determined instead to take the more deliberative and less costly approach of an initial pilot program to generate more data from which it can determine a path forward on market structure reform"); IAC Recommendation, at 2; MFA Letter, at 2; ICI Letter I, at 1–2; RBC Letter I, at 2; Joint Asset Managers Letter, at 2; Clark-Joseph Letter, at 1; Babelfish Letter, at 3; State Street Letter, at 2; Thernis Trading Letter II, at 3; IEX Letter I, at 2–3.

157 Fidelity Letter, at 2. See also, e.g., Brandes Letter, at 1 (expressing support for the Pilot and the "Commission’s effort to shed light into a subject of heated debate among market participants"); Barnard Letter, at 1 (stating that the Pilot was "important, as historically there are many views on this topic, but a paucity of credible data from which to draw conclusions"); Angel Letter II, at 1 (stating that "various commentators have wildly differing perspectives on what will happen under the pilot," which is "strong evidence as to why the pilot is necessary").

158 See, e.g., T. Rowe Price Letter, at 3; Clearpool Letter, at 2. The Commission notes that Nasdaq conducted an independent access fee experiment in 2015, but the limited nature of that experiment makes it difficult to draw conclusions from the data gathered by Nasdaq. See Proposing Release, supra note 2, at 13011–12. See also, e.g., IEX Letter I, at 6 ("Nasdaq’s experiment and its outcomes aren’t a perfect proxy for what is likely to happen in the Transaction Fee Pilot. That experiment was done unilaterally and only in highly-liquid securities."); Larry Harris Letter, at 9 (noting that Nasdaq’s "experimental fee reduction did not occur at all trading venues that traded the subject securities," demonstrating that "regulatory action is necessary to establish a common pricing standard because market forces alone will not do it").

159 See Section II.A.2 for a discussion of these comments.

160 See also Section II.A.2 for a discussion of these impacts.

161 See proposing release, supra note 2, at 13019.

The Commission notes that the proposed language in Rule 610T(b)(3)(ii)(E) has been modified slightly. As proposed, Rule 610T(b)(3)(ii)(E) was labeled as "Test Group." As adopted, the label "Pilot Group" is being substituted for the phrase "Test Group" to provide additional clarity.

162 See id.
3. No Overlap With Tick Size Pilot

While the Commission’s proposed Pilot design took into consideration the possibility that the Pilot could have been adopted before the end of the Tick Size Pilot Program, the Commission also noted that the overlap design would not be necessary if that were not the case.163

A few commenters opined on the potential overlap between the proposed Pilot and the Tick Size Pilot, disagreeing on whether overlap would be appropriate.164 However, because the Tick Size Pilot ended on September 28, 2018, there no longer is any need for the Transaction Fee Pilot to control for potential data distortions that could have otherwise resulted from the simultaneous operation of the two pilot programs. Accordingly, the Commission is not adopting the proposed Tick Size Pilot overlap design.

Relatedly, some commenters discussed whether there should be a delay between the end of the Tick Size Pilot and the start of the proposed Transaction Fee Pilot, with commenters disagreeing on that point. For example, one commenter thought a delay would be appropriate to allow markets to normalize before conducting a subsequent pilot165 while another commenter thought markets would revert to their baseline state extremely quickly after the Tick Size Pilot ends.166

The Tick Size Pilot concluded, but post-pilot data continues to be collected until April 2, 2019. However, the Transaction Fee Pilot is subject to a one-month implementation period followed by a six-month pre-Pilot Period. Accordingly, the core of the Transaction Fee Pilot will not commence until after the post-pilot period for the Tick Size Pilot ends.167 However, the Commission believes that the markets will have had sufficient time to normalize and any overlap between the Transaction Fee Pilot’s pre-Pilot Period and the Tick Size Pilot’s post-pilot period will be minimal. In both cases, the respective pre- and post-pilot periods are collecting benchmark data on the status quo. As such, the overlap between them should not compromise either dataset. Finally, two commenters recommended that the Commission analyze the Tick Size Pilot data prior to proceeding with the Transaction Fee Pilot.168 While preliminary results from the Tick Size Pilot have been made public, the two pilots are sufficiently dissimilar that the Commission sees no reason for delay. The Tick Size Pilot tested a wider minimum increment (from one cent to five cents) for smaller-capitalization stocks, whereas the Transaction Fee Pilot will test a lower rate for the Rule 610(c) fee cap and a prohibition on exchange rebates (which typically are less than one-third of a penny) for stocks of all market capitalizations. Accordingly, findings from the Tick Size Pilot are not relevant to the design of the Transaction Fee Pilot.

4. Stratified Selection of Pilot Securities

The Commission proposed to select the stocks to be included in each of the Test Groups and the Control Group through stratified sampling in a manner that permits comparisons between each Test Group and the Control Group.169

One commenter expressed support for the proposed approach to stratification and noted that it was “fundamental to the ability to undertake causal inference in this setting.”170 In contrast, a number of public company commenters expressed concern that stratified sampling could result in their stocks being placed in a different Test Group from other similar stocks in their “peer group,” which could complicate comparisons of their stock’s performance against peer-group metrics.171 As discussed above, those commenters supported allowing companies to “opt out” of the Pilot, which could impact the stratification.172

Further, as discussed above, some commenters recommended that the Commission select ETPs for the Pilot in a manner that may avoid any potential competitive effects among similar ETPs, either by: (1) Rotating all of the Pilot Securities through the various treatment groups, (2) rotating only ETPs through the various treatment groups, or (3) grouping ETPs with similar underlying holdings into the same treatment group.173

While the Commission understands the concerns of these commenters, as discussed above in Section II.B, allowing issuers to opt out of the Pilot could undermine the representativeness of the Pilot’s treatment groups and bias the Pilot’s results. Further, also as discussed above in Section II.B, rotating ETPs would require the Commission to implement a more complex and lengthy design in order to maintain sufficient statistical power, both of which would increase the costs and complexity of the Pilot—a result viewed unfavorably by most commenters. Finally, grouping similar ETPs also could negatively impact the stratification of the different treatment groups, particularly if all of the similar ETPs are similar in volume, price, and market capitalization. In turn, this could reduce the quality and usefulness of Pilot’s results by inhibiting the ability of researchers to compare treatment groups. In order to ensure that the Pilot Securities are selected in a way that permits researchers to investigate causal connections, it is imperative to stratify the Test Groups so that researchers can study the effects of changes in fees and rebates within each Test Group, between Test Groups, and between a Test Group and the Control Group. In permitting this type of analysis, the Pilot should be better able to inform future policy considerations to improve the operation of the national market system to the benefit of investors and issuers alike. Accordingly, the Commission is adopting the stratified sampling construct as proposed.

5. Number of NMS Stocks Included in Each Test Group

The Commission proposed to include 1,000 Pilot Securities in each Test Group (i.e., 3,000 total across three Test Groups) with the remainder to be included in the Control Group in order to be representative of the overall population of NMS stocks and provide sufficient statistical power to identify differences between the Test Groups with respect to common stocks and ETPs.174

Several commenters supported including 1,000 stocks in each Test Group, believing that including 1,000 stocks in each Test Group would facilitate analysis of transaction fees and rebates on a broad cross section of different types of NMS stocks and generate statistically significant conclusions.175

Many commenters, however, thought that the Pilot should include fewer

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163 See Proposing Release, supra note 2, at 13019–13020 n.117, 13020 (describing the proposed composition of the Tick Size Pilot overlap subgroups). In the Proposing Release, the Commission specifically solicited comment on whether the Pilot should overlap with the Tick Size Pilot. See id. at 13025.

164 Cf. e.g., Clark-Joseph Letter, at 2 (noting that overlap “certainly would not be a serious impediment”); SIFMA Letter, at 3 (arguing against an overlap).


168 See Proposing Release, supra note 2, at 13019.

169 See Spatt Letter, at 3.

170 See, e.g., Mastercard Letter, at 2; Avangrid Letter, at 2; Enbridge Letter, at 1.

171 See supra Section III.C.4.

172 See supra Section III.C.3.b.
Street Letter, at 10.

Fidelity Letter, at 8-9; StANY SIFMA Letter, at 4; Schwab Letter, at 2; Fidelity Letter, at 3; Nasdaq Letter, at 3; Ameritrade Letter, at 1, 3; STA Letter, at 5; STA Letter, at 3.

Further to this point, several commenters believed that a large Pilot may be difficult to unwind, with one commenter stating that an immediate return to current transaction fee and rebate dynamics for stocks included in the Test Groups “could prove to be more disruptive to market participants and overall market quality than the actual implementation of the Pilot.” Some commenters also believed the Pilot would negatively impact trading in the stocks placed in certain Test Groups, such as by adversely impacting spreads, and accordingly recommended including fewer stocks so as to limit potential negative consequences. 

Of the commenters that advocated for reducing the number of Pilot Securities in each Test Group, some suggested alternative amounts to be included. Several commenters recommended including 100 stocks in each Test Group. A few others suggested that each Test Group include 500 stocks. One commenter recommended “a more tailored Pilot that includes the 225 most heavily traded names, 225 mid-cap stocks, 225 small caps and 225 ETFs would provide statistically significant data without burdening a material portion of the market.” The Commission has carefully considered the concerns expressed by commenters regarding the size of the Pilot’s Test Groups. As previously discussed, the Commission cannot know in advance the full effects of the Pilot, whether they be positive or negative. Indeed, commenters expressed a variety of contradicting viewpoints and estimations about the potential impacts of the Pilot on the execution quality and market quality of NMS stocks that would be included in the Test Groups.

Given this uncertainty, it is crucial that the Pilot be able to produce results that are capable of facilitating an empirical review of the effect of the prevailing fee structures on the equities markets. To achieve this purpose, the Pilot needs to generate a sufficient number of observations over its one-year duration to obtain sufficient statistical power to identify differences among the Test Groups with respect to common stocks and ETFs, thereby permitting researchers to investigate causal connections using economic analysis capable of finding statistical significance. Statistical power refers to the ability for statistical tests to identify differences across samples when those differences are indeed significant and broadly is derived from the number of observations during a study. In other words, statistical power can be present when observing a limited number of subjects over a long period of time or a large number of subjects over a shorter period of time. Because the Commission desires a shorter duration for the Pilot, it therefore needs to have sufficient observable data points over the shorter pilot duration. Accordingly, if the Pilot does not contain enough securities, it may be incapable of producing statistically sound results and will not allow researchers to analyze differences in securities.

With statistical power and a sufficiently large sample size, researchers can conduct analysis of what impact (1) reductions in fees and (2) reductions in or prohibitions on rebates might have, if any, on stocks depending on their trading volume or market capitalization. A pilot design that would not provide this meaningful data about the impact that billions of dollars of exchange fees and rebates may have on the markets and market structure, would not achieve the Commission’s goal of conducting a pilot capable of facilitating an objective empirical view to advance that debate.

To achieve these aims, using econometric methods designed to allow researchers to detect a 10% change with a standard confidence level of 95%, the Commission has determined that 730 securities in each Test Group are needed to enable the Pilot to produce statistically meaningful results capable of informing the Commission’s future policymaking efforts. The Commission believes that a 10% change in behavior would represent an economically meaningful change that will facilitate analysis of the Pilot’s results, and therefore is an appropriate standard for the Pilot. The determination to include 730 securities in each Test Group accounted for the need to obtain statistically significant results among stocks of various liquidity profiles as well as ETFs. While the number of NMS stocks that will be included in each Test Group will be larger than what was recommended by some commenters, the Commission believes that a smaller number of stocks may not have sufficient statistical power given the Pilot’s proposed duration.

Furthermore, in response to comments questioning why the Pilot included more securities than did the Tick Size Pilot, the Commission notes that the Tick Size Pilot featured 400 corporate stocks for each of its Test Groups. Importantly, the Tick Size Pilot did not contain ETFs or large-cap stocks. In comparison, the Transaction Fee Pilot will contain ETFs and large-cap stocks. Accordingly, in light of the significantly higher number of securities eligible for inclusion, the Transaction Fee Pilot needs to include considerably more Pilot Securities than did the Tick Size Pilot, while continuing to achieve the same statistical power for each of those groups of securities.

Moreover, while several commenters either implicitly or explicitly referenced the EMSAC recommendation to include 100 stocks in each Test Group, EMSAC’s recommendation differs substantially from the Commission’s proposal. Notably, the EMSAC recommendation was limited to common stocks with a

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180 See Magma Letter, at 3; Schwab Letter, at 2; FIA Letter, at 4; Clearpool Letter, at 7; ASA Letter, at 5.
181 See FIA Letter, at 4; Schwab Letter, at 2; Fidelity Letter, at 8-9; Citadel Letter, at 2; State Street Letter, at 3; STA Letter, at 4; STA Letter, at 3-4; STA Letter, at 3; Nasdaq Letter I, at 10; Choe Letter I, at 27; T. Rowe Price Letter, at 4; Mastercard Letter, at 2; NorthWestern Letter, at 1; Energizer Letter, at 1; Era Letter, at 1; Knight-Swift Letter, at 2; ASA Letter, at 4-5.
182 See Magma Letter, at 3; Schwab Letter, at 2; Fidelity Letter, at 8-9; Clearpool Letter, at 7; STA Letter, at 3; STA Letter, at 5.
183 See FIA Letter, at 4; Schwab Letter, at 2; Citadel Letter, at 6; STA Letter, at 5.
184 See Magma Letter, at 3; FIA Letter, at 4; STA Letter, at 3; Clearpool Letter, at 7; Nasdaq Letter I, at 10.
185 See Citadel Letter, at 6. See also FIA Letter, at 4; STA Letter, at 5.
186 See STA Letter, at 3; STANY Letter, at 3; State Street Letter, at 3; TD Ameritrade Letter, at 1, 3; Mastercard Letter, at 2.
187 See FIA Letter, at 4; Schwab Letter, at 2; State Street Letter, at 3; STA Letter, at 3; Era Letter, at 1; Choe Letter I, at 27.
188 See FIA Letter, at 4; STA Letter, at 3; State Street Letter, at 3; STA Letter, at 3; STA Letter, at 3; Mastercard Letter, at 2.
189 See FIA Letter, at 4; Schwab Letter, at 2; State Street Letter, at 3; STA Letter, at 3; Era Letter, at 1; Choe Letter I, at 27.
190 See FIA Letter, at 4; STA Letter, at 3; STA Letter, at 3; STA Letter, at 3; Mastercard Letter, at 2.
191 See FIA Letter, at 4; Schwab Letter, at 2; State Street Letter, at 3; STA Letter, at 3; Era Letter, at 1; Choe Letter I, at 27.
192 See FIA Letter, at 4; STA Letter, at 3; STA Letter, at 3; STA Letter, at 3; Mastercard Letter, at 2.
194 See supra notes 175-183 and accompanying text.
195 See, e.g., supra notes 75-93 and accompanying text.
196 A confidence level of 95% is a standard accepted confidence level in statistical analyses. See, e.g., William H. Greene, Econometric Analysis 1033 (Appendix C.6) (6th ed. 2007) (discussing standard confidence levels in academic research).
197 See also note 695 infra.
market capitalization above $3 billion and did not include ETPs, mid- and small-cap stocks, or other types of NMS stocks. In order for the Pilot to permit a broader empirical review of the impact of transaction fees and rebates on order routing, execution quality, and market quality, it is critical that the sample size be representative of the population of NMS stocks for which exchange transaction fees and rebates are economically meaningful. The Pilot must contain enough securities to achieve the statistical power necessary to permit closer analysis of the Pilot’s results in order to identify differences in order routing behavior, market quality, and execution quality among subgroups of NMS stocks (e.g., ETPs, or tiers of common stock).

6. Reduction to the Pilot Size

To respond to commenters’ concerns with the size of the Pilot, including a recommendation from the SEC’s Investor Advisory Committee, the Commission has determined to eliminate one Test Group and reduce the number of stocks in each Test Group to 730.

In order to materially reduce the size of the Pilot without sacrificing statistical power, the Commission has determined to: (1) Only place Pilot Securities in a Test Group if, at the time of selection, they trade 30,000 shares or more per day on average and (2) eliminate a Test Group.

With respect to securities that trade fewer than 30,000 shares per day, assuming, at an extreme, that such security trades 100% of its volume on a maker-taker exchange paying a $0.0030 rebate, then it would generate $100 in rebates per day. In addition, for thinly-traded stocks with wider spreads, the rebate would be less impactful as it would represent a smaller percentage of the quoted spread. This amount of rebates would be economically insignificant and would be unlikely to impact order routing behaviors of broker-dealers. In addition, this level of trade volume makes it unlikely to produce sufficient statistical power to analyze the securities in isolation because the variability in their quoting and trading characteristics renders it unlikely the Pilot would generate a sufficient number of observations given the Pilot’s proposed duration. In addition, for commenters that believe that thinly-traded stocks need rebates to narrow their quoted spreads, excluding these securities from the Pilot will allow exchanges to continue to apply their current fee schedules to them, which will provide another point of reference to analyze when comparing these

securities to those with slightly higher trading volumes.

Finally, the Commission believes that eliminating one Test Group and functionally combining proposed Test Group 1 and Test Group 2 into a new Test Group with a $0.0010 cap will result in decreasing the number of NMS stocks included in a Test Group in the Pilot by one-third, which is integral in reducing the overall size of the Pilot by more than one-half. The Commission believes this material reduction directly responds to commenters’ concerns, while still providing the Pilot with a meaningful group in which to test a reduced fee cap and a prohibition on rebates and Linked Pricing.

Accordingly, the Commission believes that the Pilot’s design of 730 NMS stocks per Test Group strikes an appropriate balance by reducing the number of stocks in each Test Group and thus mitigating the concerns of commenters about potential detrimental impacts that could be caused by the proposed larger size of the Pilot, without undermining the ability to obtain useful data to study the impact of changes to transaction fees and rebates on order routing behavior, execution quality, and market quality for a broad spectrum of stocks. It also is large enough to accommodate drop offs among Pilot Securities (e.g., due to mergers, bankruptcies, or stocks closing below $1).

7. Fee Cap Test Groups

The Commission proposed that 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 best bid or offer of such market in NMS stocks that exceeds or accumulates to more than $0.0015 per share. The level proposed for Test Group 2 was $0.0005 per share. After careful consideration of the comments received, which are discussed below, the Commission is eliminating Test Group 2 and adopting a revised Test Group 1 with a $0.0010 cap.

a. Fee Cap Level

Commenters disagreed about the appropriateness or justification for the proposed fee cap levels. For example, one commenter stated that “exchanges currently compete on fees by offering a range of access fees and rebates within the confines of the current $0.0030 access fee cap” but the fee caps in Test Groups 1 and 2 “will reduce the exchanges’ ability to compete on fees by 50% in Test Group 1” and “83% in Test Group 2” which could be “to the detriment of investors and the public interest.” In contrast, regarding proposed Test Group 1, another commenter stated that “[a]t 15 mils, there is still room for significant fee differentiation and rebates remain sizeable.”

With respect to Test Group 2, one commenter stated that “[i]f the ultimate intent of the proposal is to determine whether or not reducing access fees will have an effect on how brokers route their customers’ orders, then we fully support the notion of Test Group 2 to see if the incentive to avoid access fees is eliminated with a 5 cents per 100 share cap.” Another commenter further stated that “to the extent that rebates have been traditionally funded by exchanges, and the fees collected,” then Test Group 2 “may lead to rebate reductions” and obtaining data on this point is “part of the reason why a study is needed.” Finally, the Investor Advisory Committee recommended that the Commission structure the Pilot’s Test Groups “as simply as possible,” and was not persuaded that, in addition to having the no-rebate Test Group, having two additional Test Groups with separate fee caps “will generate enough additional information to justify the additional effort.” Accordingly, the Investor Advisory Committee recommended that the Commission consider having, in addition to the no-rebate Test Group, only one Test Group with a fee cap and suggested a cap of $0.0010.

The Commission appreciates the recommendation of the Investor Advisory Committee and agrees with it. As noted above and further discussed below, eliminating Test Group 2 will decrease the size of the Pilot by one-third.
third. New Test Group 1 will have a cap of $0.0010, which adopts the Investor Advisory Committee’s recommendation and represents a blended average of the two fee caps the Commission originally proposed.

The Commission believes that new Test Group 1 retains the equities exchanges’ ability to compete through differing fees and rebates, as a fee cap of $0.0010 provides exchanges with an opportunity to utilize various fee and rebate structures to compete for order flow. As some commenters noted, the current access fee cap was set thirteen years ago and may represent an outsized portion of transaction costs in light of the technological efficiencies achieved by the equities markets in the last decade.200

As revised, new Test Group 1 will facilitate an analysis of the extent to which exchanges reduce rebates from their current levels as a result of a materially reduced cap on the fees used to subsidize those rebates, and the impact of a reduced fee and rebate level on order routing behavior, execution quality, and market quality. In addition, by materially reducing the fee cap, the Commission believes that new Test Group 1 will provide useful data on the extent to which current exchange fee levels (bounded by the current access fee cap) serve as a disincentive to take liquidity on an exchange. Obtaining useful information to better understand the potential impact of a significantly reduced access fee cap will ultimately be beneficial to investors and the public interest, as it may help illuminate the extent to which the current fees and rebates effect the market and the extent to which those effects have a detrimental impact on investor transaction costs.

b. Applicability to Depth-of-Book and Non-Displayed Liquidity

As proposed, Test Groups 1 and 2 were designed to isolate and test a reduction in the Rule 610(c) fee cap, with all else remaining unchanged. In the Proposing Release, the Commission asked whether commenters thought the fee caps Test Groups 1 and 2 also should apply to depth-of-book and undisplayed liquidity.201 One commenter recommended that it should.202

In the Proposing Release, the Commission stated that it preliminarily believed it was unnecessary for the fee cap Test Groups to apply to depth-of-book and undisplayed liquidity because it would be highly unlikely for an exchange to begin charging more to access non-displayed interest or depth-of-book quotes (compared to displayed interest), as it would lead to uncertainty for market participants that remove liquidity because they typically would not be able to know in advance or control with absolute certainty whether they interact with non-displayed interest or depth-of-book quotes.203 The Commission continues to believe it would be unlikely that either maker-taker or taker-maker exchanges would begin charging differing fees in such a manner.204 Furthermore, the Commission notes that the Rule 610(c) access fee cap does not currently apply to non-displayed interest or depth-of-book quotes. Introducing a new variable into the fee cap Test Groups would make it more difficult to isolate the effects of a particular change and uncover causal connections. Accordingly, for the reasons noted above and discussed in the Proposing Release, the Commission is not adopting this suggestion.205

200 See Proposing Release, supra note 2, at 13023 n.136–37 and accompanying text.
201 See Proposing Release, supra note 2, at 13025.
202 See Clearpool Letter, at 3 n.6.
203 See Proposing Release, supra note 2, at 13022–23.
204 See Section II.C.5.d infra. See also Proposing Release, supra note 2, at 13037.

As revised, new Test Group 1 will facilitate an analysis of the extent to which exchanges reduce rebates from their current levels as a result of a materially reduced cap on the fees used to subsidize those rebates, and the impact of a reduced fee and rebate level on order routing behavior, execution quality, and market quality. In addition, by materially reducing the fee cap, the Commission believes that new Test Group 1 will provide useful data on the extent to which current exchange fee levels (bounded by the current access fee cap) serve as a disincentive to take liquidity on an exchange. Obtaining useful information to better understand the potential impact of a significantly reduced access fee cap will ultimately be beneficial to investors and the public interest, as it may help illuminate the extent to which the current fees and rebates effect the market and the extent to which those effects have a detrimental impact on investor transaction costs.

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The Commission also recognizes, as did commenters, that it is possible that the exchanges may choose to subsidize rebates in Test Group 1 from other sources of revenue, which could result in rebates exceeding the fee cap in that group. Whether and to what extent that would occur in practice would be an important result in new Test Group 1, and so the Commission believes the Pilot should be structured so as not to preclude that possible result. The Commission will closely monitor the fees charged by the exchanges for non­-transaction services during the Pilot and will consider the Pilot’s impact on such fees.

d. No-Rebate Test Group

The Commission proposed that for Pilot Securities in Test Group 3, equities exchanges generally would be prohibited from offering rebates, either for removing or posting liquidity, and from offering Linked Pricing, which, as discussed further below, is defined as a discount or incentive on transaction fee pricing applicable to removing (or providing) liquidity that is linked to providing (or removing) liquidity.211 In addition, Test Group 3 would be unique in that its restrictions would apply not only to displayed top-of-book212 liquidity, but also would apply to depth-of-book213 and undisplayed liquidity.214 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.

After careful consideration of the comments received on Test Group 3, discussed below, the Commission is adopting (note 610T(a)(3) as proposed, though it is being renamed as “Test Group 2” since the Commission has reduced the number of Test Groups from three to two.

211 See Proposed Rule 610T(a)(3); Proposing Release, supra note 2, at 13022–24.

212 “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”).

213 “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 “best bid” and “best offer”).

214 “Undisplayed” refers to resting orders that are “hidden” and not displayed publicly in the consolidated market data. See 17 CFR 242.600(b)(12) (defining “consolidated display”) and (b)(60) (defining “published bid and published offer”).

e. Prohibiting Rebates

While there was significant disagreement among commenters on this aspect of the Pilot, most commenters supported a “no rebate” group as they believed it was critical to fully examine the effect that transaction fees and rebates have on order routing behavior, execution quality, and market quality.215

In contrast, several commenters opposed prohibiting equities exchanges from paying rebates. Specifically, three of the four exchange commenters asserted that it would inhibit the ability of exchanges to compete with off-exchange trading venues.216 In addition, these three commenters, together with other commenters, expressed concerns that prohibiting exchanges from paying rebates to liquidity providers would widen the quoted bid­ ask spread on exchanges, which could raise costs on investors.217 Several of these commenters well­ned that eliminating rebates for “less liquid” “small and medium sized companies” would disproportionately impact the quoted spreads for such stocks as they believed that rebates are a more significant incentive to provide liquidity for less actively traded securities.218 Other commenters also expressed concerns that spreads would widen for ETPs, specifically less liquid ETPs, if rebates were prohibited or significantly reduced.219

The Commission is aware of the potential for adversely impacting smaller capitalization securities, however, the Commission does not agree with the commenters that the Pilot necessarily will result in such harm, or if there are adverse effects in the trading of all or some portion of smaller capitalization securities, that the net effect across securities will be negative. Rather, the Commission agrees with the many commenters who believed that it is unclear what the ultimate net impact of a no­rebate Test Group will be on quoted spreads and trading costs for NMS stocks of different market capitalizations and trading characteristics.220 The purpose of the Pilot is to generate results that can offer data­driven insight on these questions as a basis for possible future policy making in this area. As discussed elsewhere, the revised Pilot has excluded securities that trade fewer than 30,000 shares per day, as they are less likely to provide actionable data.

This lack of empirical clarity is reflected in the divergent views of commenters who offered conflicting predictions of the outcome of a no­rebate Test Group. For example, one commenter questioned whether rebates were necessary to attract displayed liquidity, opining that “[p]ublic data shows that inverted and flat­fee exchanges often have quotes on both sides of the NBBO, which shows that market participants are willing to pay these exchanges to post quotes at the NBBO based on their intrinsic desire to trade and not just in response to an exchange rebate.”221 In response, one exchange commenter suggested that Choe EDGA Exchange, which does not pay rebates, has wider spreads for displayed liquidity as compared to Choe EDGX Exchange, which does pay rebates for posting liquidity.222 A different commenter did not “anticipate a material widening for the most liquid names (where rebates aren’t necessary to incentivize liquidity providers) or the most illiquid names (where rebates aren’t sizable enough to incentivize liquidity providers),” and instead anticipated “a likely outcome of increased spreads for the middle tier of

220 See, e.g., Decimus Letter, at 5 (observing that “claims on the existence of unambiguous harm to liquidity appear to be exaggerated and driven by preemptive notions”). 221 See also Section IV infra (discussing the uncertainty of the Pilot’s outcomes).

222 See, e.g., IEX Letter II, at 7. One commenter questioned NYSE’s analysis in this regard, noting that in general EDGA’s volume is limited to “the most liquid names.” This commenter stated that NYSE “distorts the real likely impact of the [Pilot] by including spreads on less liquid securities. See Mulson Letter II, at 2.
securities, where rebates have perhaps kept spreads artificially narrow.223

Another commenter believed that quoted prices are "almost always set by natural investors" and therefore, "removing rebates will not disrupt the desire of natural investors to post liquidity and tighten spreads."224 In response, one commenter was "skeptical" about this and stated that "it is not realistic for the buy-side to be continuously active on both sides of the market across all stocks impacted by the Transaction Fee Pilot."225 That said, another commenter, which also is a listed issuer, stated that it did not "expect that a reduction or outright removal of rebates will have any significant or harmful effects on the quality of prices displayed in the public lit market, interfere with genuine liquidity and price formation, or negatively impact [its] stock’s trading volume, spread or displayed size."226

The Commission believes that the significant disagreement among commenters on the potential impacts of prohibiting rebates demonstrates the need to include a no-rebate bucket in the Pilot. For example, it is unclear what effect—if any—the payment of a rebate has on a stock that trades over 10 million shares per day with an average natural quoted spread width constrained by the minimum trading increment of $0.01. Likewise, it is unclear what effect—if any—the payment of a rebate has on a stock that trades less than 100,000 shares per day with an average quoted spread of $0.10 or more. In either case, the absence of rebates may have little or no effect on quotes or competition for natural order flow in such securities. Data is needed to empirically evaluate commenters' diverging views of the effect of rebates. The Pilot is designed to produce this and other data.

By prohibiting rebates in one Test Group the Pilot should produce results that facilitate a direct study of the effect of rebates, including on fees, order routing, execution quality, and market quality.227 The Commission believes that the no-rebate Test Group will provide useful information on trading in the absence of rebates that will facilitate a data-driven approach to better understand the role and effect of rebates in our current market structure. The results generated by this Test Group will allow researchers to study the relationship between rebates and quoted spreads for stocks of varying liquidity profiles and market capitalizations. It also will allow market participants to directly test with their own order flow whether, in the absence of rebates in the most actively traded stocks, they are better able to compete for queue priority and thereby capture the quoted spread when posting liquidity.228 Therefore, the Commission continues to believe that the Pilot will be substantially more informative with a no-rebate bucket and the value of generating that information to inform the Commission's consideration of the effect of exchange transaction fee models justifies proceeding with the Pilot to better inform both sides of the rebate debate with data to test their hypotheses.

In summary, the Commission has carefully considered commenters' suggested alternatives and whether to include the no-rebate feature in the Pilot, and in light of the important regulatory purpose the Pilot is designed to achieve, the Commission has determined that, for the reasons discussed throughout, it is important to have a Test Group that specifically focuses on the removal of rebates and the corresponding impact on conflicts of interest, execution quality, and market quality.

Finally, one commenter asserted that banning rebates "presents a misapplication of Rule 610(c)" because the Commission has never before banned rebates.229 While neither Rule 610(c), nor any other Commission rule, currently prohibits a national securities exchange from paying a rebate to provide or remove liquidity, the Commission does not believe that the no-rebate Test Group misapplies Rule 610(c), or any other rule. The no-rebate Test Group is not based on or related to Rule 610(c). Rule 610(c) caps fees for removing a protected quotation, whereas the no-rebate Test Group does not further limit fees and instead prohibits rebates, among other things. Indeed, the Rule 610(c) fee cap continues to apply—unchanged and in its entirety—to the no-rebate Test Group.

The data generated by the Pilot will help empirically assess, in light of changing market conditions, whether the existing transaction-based fee and rebate structure continues to further the statutory goals.230 Importantly, while exchanges would retain the ability to charge transaction fees as high as the current $0.0030 cap in the no-rebate Test Group, they would no longer need to charge transaction fees at levels priced to offset the rebates they formerly paid. Accordingly, the no-rebate Test Group is intended to test, within the current Regulation NMS regulatory structure, natural equilibrium pricing for transaction fees.

f. Application to Depth-of-Book and Non-Displayed Liquidity

Several commenters supported applying the prohibition on rebates in the no-rebate Test Group to depth-of-book and non-displayed liquidity as they believed it would avoid the risk that the Pilot's results could be subject to distortions if exchanges continue to offer rebates for depth-of-book and non-displayed liquidity.231 In contrast, two exchange commenters opposed this aspect of the proposal. One characterized this aspect of the proposal as an "unjustified pricing restriction" that was part of a "new regulatory scheme . . . ."232 The other argued that "[the Proposal lacks internal coherence] in that it excludes ATSs because these do not have protected quotes, but then includes unlit exchange orders that also are unprotected."233

For the reasons stated in the Proposing Release, the Commission continues to believe that allowing exchanges to continue to offer rebates in the no-rebate Test Group for depth-of-book and non-displayed orders could substantially distort the Pilot results.234 The no-rebate Test Group is designed to test the absence of exchange transaction rebates. It would weaken the Pilot's results to prohibit rebates on displayed orders but allow them on non-displayed orders, as the Pilot would not be able to collect data on what would happen in the absence of rebates. Only by prohibiting the payment of all rebates in one Test Group will the Commission be able to gather data on a pure "no rebate" environment, thereby facilitating a direct observation of the impact of rebates on order routing behavior, execution quality, and market quality.

223 See, e.g., T. Rowe Price Letter, at 2; Brandes Letter, at 1–2; Babelfish Letter, at 2.
224 See Choe Letter I, at 12–13. See also Section ILG (responding to comments regarding the Commission's legal authority to conduct the Pilot).
225 See, e.g., Clark-Joseph Letter, at 2; Clearpool Letter, at 3 n.6; Healthy Markets Letter I at 18; IEX Letter I at 7.
226 See NYSE Letter I at 12.
227 See Proposing Release, supra note 2, at 13022–23.
228 See also Credit Suisse Commentary, at 3.
229 See Mulson Letter I, at 1. See also IEX Letter II, at 6.
230 See T. Rowe Price Letter, at 5.
231 See Proposing Release, supra note 2, at 13022–23.
current regulatory structure, natural equilibrium pricing for transaction fees in an environment where exchange transaction-based rebates are prohibited.\textsuperscript{239} While this would theoretically allow an exchange to charge fees in excess of $0.0030 to provide liquidity, the Commission notes that several exchanges stated that one of the perceived benefits in providing rebates to liquidity providers is that it facilitates narrower spreads and therefore believes it is unlikely exchanges would charge such higher fees during the Pilot.\textsuperscript{240}

One commenter expressed concerns that the no-rebate Test Group would “provide exchanges with the flexibility to propose a variety of new fee structures for liquidity-taking orders,” which could create new conflicts for brokers routing customer orders.\textsuperscript{241} Accordingly, this commenter believed that the no-rebate Test Group should instead impose a fee cap of $0.0002, where the expectation would be that rebates would be lowered to a \textit{de minimis} amount and the Pilot would be more symmetrical and thereby more effective in analyzing broker order routing practices.\textsuperscript{242} The Commission continues to believe that in light of the current debate surrounding the potential conflict of interest posed by the payment of rebates and potential effects they may have on the markets, including the many comments received in response to the Proposal, the Pilot will be substantially more informative with a no-rebate bucket than a bucket that dramatically lowers the fee cap assuming that rebates would follow. While reducing the fee cap to $0.0002 would reduce the likelihood that an exchange would offer rebates at current levels (assuming the exchange desired to fund transaction-based rebates only through transaction-based fees), exchanges would retain the ability to pay rebates and could subsidize them from other sources of revenue leading to rebates that greatly exceed $0.0002. In contrast, only a complete prohibition on rebates will permit researchers to observe directly the impact of rebates on order routing behavior, execution quality, and market quality, and compare this Test Group to the Control Group and the other Test Group where rebates can continue to be offered. Further, imposing a fee cap of $0.0002 instead of prohibiting rebates would not allow Test Group 2 to test, within the

\textsuperscript{239} See Proposing Release, supra note 2, at 13023.
\textsuperscript{240} See supra notes 217–218 and accompanying text.
\textsuperscript{241} See Citided Letter, at 5.
\textsuperscript{242} See id.

b. Prohibiting Linked Pricing

In connection with prohibiting rebates, the no-rebate Test Group also would prohibit Linked Pricing, such that 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.\textsuperscript{243} Some commenters that addressed the prohibition on Linked Pricing were supportive of the proposal and generally believed that the prohibition would preserve the integrity of the Pilot and facilitate an environment where exchanges are able to set transaction fees at a natural equilibrium level.\textsuperscript{244} In contrast, two exchange commenters opposed the prohibition.\textsuperscript{245} Specifically, one commenter characterized this aspect of the proposal, in conjunction with the prohibition on rebates, as an “unjustified pricing restriction” that is “unrelated to Regulation NMS’s Access

\textsuperscript{243} See Fidelity Letter, at 9; Citadel Letter, at 5.
\textsuperscript{244} Credit Suisse Commentary, at 4.
\textsuperscript{245} See Proposing Release, supra note 2, at 13023. The Commission notes that most exchanges also utilize pricing in their pricing models in which they offer lower fees or larger credits in return for additional volume. See, e.g., Spatt Letter, at 4; RBC Letter II, at 4.
\textsuperscript{246} See, e.g., Capital Group Letter, at 3; IEX Letter I, at 7.
\textsuperscript{247} See NYSE Letter I, at 12; Choe Letter I, at 10.
Fee Cap.” 248 As discussed above, the no-rebate Test Group, including the
Linked Pricing prohibition, is not based exclusively on the Rule 610(c) fee cap.
The Commission continues to believe that prohibiting Linked Pricing supports the
objective of the no-rebate Test Group, which is to gather data on the impact
where fee levels are not potentially distorted by rebates or transaction fee
reduction and rebates do not influence routing, particularly for customer orders.249 In
the absence of a Linked Pricing prohibition, exchanges could use make (take) volume to subsidize make (take) activity, which could perpetuate the cross-subsidization of fees. For example, if an exchange adopts Linked Pricing for the no-rebate Test Group securities, it might offer a discounted transaction fee to remove liquidity only to those market participants that post a certain volume on the exchange. Perpetuating this potential distortion could cloud the Pilot results for the no-rebate Test Group if the Linked Pricing incentive interferes with the Pilot’s ability to isolate and analyze the impacts on fees and routing that the no-rebate Test Group is designed to study.

Two commenters recommended that the Commission also prohibit an exchange from offering any inducement, including discounts on non-transaction fees, as those for market data, co-location, or connectivity ports, which are linked to trading volumes in the no-rebate Test Group.250 The Commission is not expanding the application of the Linked Pricing prohibition in the manner suggested by these commenters. The Pilot, and the no-rebate Test Group specifically, is designed to test the extent to which transaction fees and rebates create conflicts of interest that influence order routing or introduce distortions that impede execution quality and market quality. The Pilot is not designed to eliminate or control for all potential inducements to transact on a particular market and the Commission believes that expanding the Pilot to a wider array of variables could inhibit the Pilot’s ability to isolate the impacts of exchange transaction-based rebates and the effects they may have.251

Further, two commenters requested the Commission to clarify that the
Linked Pricing prohibition applies across Test Groups such that exchanges may not tie rebates or transaction fee discounts in another Test Group to volume in the no-rebate Test Group.252 As previously stated in the Proposal, the no-rebate Test Group 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 proposing the Linked Pricing prohibition, the Commission recognized that a Linked Pricing arrangement could potentially distort transaction fee pricing if fees continue to be set at a subsidy level above their natural equilibrium, and it also could perpetuate the potential conflicts of interest associated with rebates and order routing. Any Linked Pricing incentives offered by exchanges that are linked, or otherwise related to, posting or removing liquidity in Pilot Securities included in the no-rebate Test Group would contradict the Commission’s intent for the no-rebate Test Group and frustrate the ability of the Pilot to generate useful data in that group. Accordingly, the Linked Pricing prohibition in Test Group 2 prohibits exchanges from offering any discounts or incentives on transaction fees that are linked to activity, whether it be posting or removing activity, in any securities included in Test Group 2, as well as prohibits exchanges from offering Linked Pricing arrangements in Test Group 2 securities that are based on, or include, activity in any Pilot Securities.

In addition, one commenter “suggest[ed] that the linked pricing prohibition should extend to auction fees or any other transaction fees charged by the exchange” as “[c]losing auction fees, especially, are a significant source of listing market revenue, and . . . discounts on these fees could likewise lead to the distortions described by the Commission (or even to increases in auction fees to other participants to fund the targeted discounts).” 253 Because Rule 610T(a)(3) prohibits exchanges from providing a discount or incentive on transaction fees applicable to removing (providing) liquidity that is linked to providing (removing) liquidity, and auction fees are “transaction fees,” the Linked Pricing prohibition applies to auction fees. Exchanges will not be permitted to consider make (take) volume during intraday trading when calculating auction fees, as such an arrangement would perpetuate potential distortions associated with fee-and-rebate pricing models including the cross-subsidization of fees.

i. Linked Pricing Market Maker Exception

The Commission proposed an exception to the Linked Pricing prohibition to permit an exchange to adopt new rules to provide non-rebate Linked Pricing to its registered market makers during the Pilot in consideration for the market maker meeting rules-based market quality metrics.254 The Commission explained that to qualify for this limited exception, an exchange would need to propose market making standards in a rule change 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.255

Several commenters requested further clarification about the market maker exception to the prohibition on Linked Pricing. Specifically, one commenter recommended that the Commission provide additional detail about the types of market quality metrics upon which access to Linked Pricing is contingent.256 Other commenters believed that it is important that any such standards adopted by exchanges be sufficiently stringent to prevent market participants from availing themselves of Linked Pricing in a manner that would jeopardize the ability of the no-rebate Test Group to provide valuable data on the impact of the absence of rebates (or a rebate-like incentive) on order routing behavior, execution quality, and market quality, or that would permit market participants to unfairly exploit this aspect of the Pilot.257

The Commission continues to believe that permitting exchanges to adopt rules to offer Linked Pricing to their registered market makers for securities in the no-rebate Test Group preserves the ability of an exchange to attract market makers through non-rebate incentives and thereby helps maintain the baseline framework in which exchange can provide incentives to their registered market makers.258

Commenters highlighted the importance of ensuring that any new rules that exchanges propose to provide Linked Pricing to registered market makers in the no-rebate Test Group be designed so as to not inhibit the Pilot’s ability to

248 See Proposing Release, supra note 2, at 13023-24.
249 See RBC Letter I, at 3; MFS Letter, at 2-3.
250 As is the case for any fee or fee change an exchange adopts, if an exchange were to propose such a fee change it would need to analyze in its Form 19B-4 filing how its fee change constitutes an "equitable allocation" of "reasonable" fees and how it is not "unfairly discriminatory." See 15 U.S.C. 78s(b)(3)(A)(ii).
252 See IEX Letter I, at 7.
253 IEX Letter I, at 7.
generate useful data on the impact of rebates on order routing behavior, execution quality, and market quality. The Commission agrees that if they are not narrowly tailored, these non-rebate incentive programs could continue to potentially distort transaction fee pricing, particularly if the exchange’s fees are set at a subsidy level above the natural equilibrium within the current regulatory structure to subsidize these market maker incentives.

Rather, the market maker exception to Linked Pricing is intended to permit an exchange to impose rules for its registered market makers in ways that would improve its market in a meaningful way, such that it could use the enhanced liquidity provided by its registered market makers to improve its displayed quotation and thereby attract buyers and sellers to the exchange. The non-rebate incentives would only apply to trading activity by a registered market maker in its capacity as a market maker (i.e., acting as principal), and would not apply to any customer activity or activity from other trading desks or business units affiliated with the market maker (and possibly using the same MPID), be it agency, principal or riskless principal trading, traded by or through such market maker.

Accordingly, only a registered market maker’s principal trading activity in its capacity as a registered market maker in the no-rebate Test Group would be able to satisfy any market quality metrics, and the only trades that would be eligible to receive the non-rebate incentive pricing would be a registered market maker’s principal trades in its capacity as a registered market maker in the no-rebate Test Group securities.

8. Control Group

The Commission proposed that Pilot Securities that are not placed in one of the Test Groups would be placed in the Control Group. One commenter addressed the Control Group and supported the Commission’s proposed approach. The Commission continues to believe that a control group is vital to test the effects of fee changes in the Test Groups, as a control group subject to the current access fee cap would provide an appropriate baseline for analyzing the effects of the Pilot against the status quo. For these reasons and the reasons discussed in the Proposing Release, the Commission is adopting the Control Group as proposed, which will be subject to the current Rule 610(c) access fee cap.

9. Alternative Designs

a. Include a Trade-At Requirement

In the Proposing Release, the Commission asked whether the Pilot should include a “trade-at” provision that would restrict price matching of protected quotations. Several commenters supported including a trade-at requirement because they believed doing so would increase the amount of liquidity available on exchanges and thereby further price discovery. In contrast, other commenters opposed including a trade-at requirement as they believed doing so would increase the Pilot’s complexity; impact the ability of the data to assess the impact of transaction fees and rebates on order routing, execution quality, and market quality; be inconsistent with, or unnecessary for, a study of the issues pertinent to the Pilot; and be anti-competitive.

In addition, two commenters noted that a trade-at requirement would not be necessary because the reduction in the fee cap ultimately could result in more volume being executed on exchanges. The Commission believes that adding a trade-at requirement would unnecessarily complicate the Pilot in a manner that would increase costs on market participants and potentially impact the ability of the Pilot to isolate the effects of changes in exchange transaction fees and rebates.

b. No Fee Cap Test Group

Several commenters advocated for including a Test Group that does not cap transaction fees, believing that it is important to test whether competition alone can constrain pricing and result in a natural equilibrium transaction fee. One commenter noted that currently fees tend to “cluster” at the access fee cap imposed by Rule 610(c) and as such recommended including an additional Test Group that does not cap fees. When it adopted Rule 610(c), the Commission explained that the access fee cap is necessary to, among other things, inhibit the ability of exchanges to take advantage of the Order Protection Rule by acting as a “toll booth” between price levels and ensure that quotations are fair and useful by limiting the ability of high fees to distort the price of displayed limit orders. The Commission believes that the no-rebate Test Group will permit analysis of the impact of competitive forces on fees in the absence of current practices...
that use fees to subsidize those rebates. Specifically, to the extent exchanges will no longer need to charge access fees up to $0.0030 to subsidize rebates in that Test Group, the Commission believes that competitive forces among the exchanges may result in fees approaching a new equilibrium level, within the current regulatory structure, for stocks in the no-rebate Test Group.

The Commission notes that the order protection requirements of 17 CFR 242.611 (Rule 611) will continue to apply to all of the Pilot Securities including those in the no-rebate Test Group. As such, the basis for imposing a fee cap (summarized above) remains intact during the Pilot and the Commission believes that applying the current fee cap to the no-rebate Test Group would guard against the possibility, albeit highly unlikely, that an outlier exchange could seek to charge exorbitant fees for the no-rebate Test Group stocks that would be inconsistent with the rationale behind the Rule 610(c) fee cap.

c. Basis Point Pricing

Two commenters recommended that, because stock prices have increased (i.e., a number of high profile stocks currently trade above $100 per share), using basis point pricing may be a better reference point than using the current access fee cap because the current access fee cap can impact stocks differently based on their price.

Specifically, one of these commenters proposed that "Test Group 1 contain the same constraints as Test Group 3 but with an access fee limitation expressed in basis points." However, the Commission believes that doing so would increase the Pilot's complexity and could interfere with the Pilot's ability to provide useful data to assess the impact of the current exchange fee models on order routing behavior, execution quality, and market quality because exchange transaction fees and rebates are currently not assessed in basis points and thus this would introduce a new variable into the Test Group as it could raise or lower the fees depending on a stock's share price, which can vary over time. The more variables that are introduced, the more difficult it could be to isolate the effects of a particular change and uncover causal connections. Accordingly, the Commission is not adopting a requirement that one of the Test Groups include an access fee cap expressed in basis points.

d. Higher Fee Caps and Fees Based on Tick Size

Four commenters addressed a question in the Proposing Release about including a Test Group that would allow for access fees higher than the current cap under Rule 610(c). One of these commenters specifically recommended reducing access fees to $0.0005 per share for the most liquid securities, while imposing gradually higher access fees for stocks of lower liquidity, up to a cap of potentially $0.0050 for the least liquid securities. Another commenter recommended including an additional Test Group with an access fee cap of $0.0040, believing this would provide data to test whether an increase in the fee cap reduces bid-ask spreads in light of the many comments contending that spreads will increase in conjunction with lower rebates connected to a reduced access fee cap. In addition, one commenter suggested that if tick sizes were set based on the characteristics of an individual stock, the transaction fee cap could then be a particular percentage of the tick size.

Such an approach could result in an access fee cap above $0.0030 per share for certain securities. The Commission has carefully considered these suggestions. As discussed above, other commenters have noted that the current access fee cap was set thirteen years ago when markets and technology were markedly different. Indeed, a few commenters argued it was outdated and too high. Accordingly, the Commission does not believe that raising the access fee cap to levels that are above what trading centers were charging thirteen years ago necessarily is consistent with the technological efficiencies that have been realized in the intervening years. While market-based solutions and even regulatory responses to enhance the investor experience with trading in thinly-traded securities are worthy of attention, and were the subject of a recent Division of Trading and Markets staff roundtable, the Commission does not believe that the Pilot should introduce the potential for higher rebates—and the further exacerbated distortions that would likely accompany them—when it is attempting to study the effect of the current exchange fee models and fee and rebate levels.

Accordingly, the Commission is not adopting a higher fee cap in any of the Pilot's Test Groups.

e. Order Protection Rule

The Commission solicited comment on whether it would be appropriate to suspend the Rule 611 order protection requirements in one or more Test Groups. In response, three commenters opposed eliminating the order protection requirements within the Pilot because doing so would increase the cost and complexity of the Pilot, and also could complicate analysis of the Pilot's results to the extent it clouded the focus on transaction fees and rebates.

In contrast, one commenter recommended eliminating the order protection requirements for securities in the no-rebate Test Group. This commenter stated that prohibiting rebates is insufficient to "remove the perceived or real conflicts on broker routing or materially address" various negative effects that the commenter believed Rule 611 has had on the equities market.

After considering the comments received, the Commission believes that the Pilot should not introduce additional variables by, in this case, removing the Rule 611 protected quotation status for automated quotations in any particular Test Group. In order to add a new variable to the Pilot, the Commission would need to include additional Test Groups and increase the number of securities in order to be able to isolate separately the effects of each variable that is included.

272 See, e.g., Goldman Sachs Letter, at 2 (characterizing $0.0030 as an "outdated benchmark" that "is too high and far from representative of true prices in the marketplace").

273 The Commission notes that the Proposal included a question regarding whether a fee cap would continue to be necessary to constrain exchange pricing if equilibrium pricing is achieved and the Commission expects that some market participants may analyze the Pilot results for answers to this question. See Proposing Release, supra note 2, at 13025.

274 See Clearpool Letter, at 3; Choe Letter II, at 8–9. Another commenter also stated that it thought it was "a worthwhile exercise to explore the possibility of a move to basis points. . . ." See Citi Letter, at 6.

275 See supra note 200 and accompanying text.

281 See id.

in the Pilot or else it would create an asymmetric Pilot that would make it more difficult to evaluate the data and establish causal inferences regarding the impacts of changes to exchange transaction fees and rebates. As discussed above, most commenters were critical of the Pilot’s proposed size. The Commission desires to have a narrowly tailored pilot focused on generating useful data on the impact of exchange fees and rebates on order routing behavior, execution quality, and market quality. Adding another variable to the Pilot would increase the Pilot’s complexity as well as costs of the Pilot.

f. Other Ideas for Additional Test Groups and Related Questions

In addition to the above questions, the Commission asked a number of other questions in the Proposing Release to solicit commenters’ opinions on equities market structure issues and whether the Pilot should be used as a vehicle to further investigate other related areas. The Commission received a few comments on these points. For example, in response to a question about whether commenters believe the minimum trading increment should be reduced for the most actively traded NMS stocks if the Pilot’s data suggests that rebates do not significantly improve market quality or execution quality for those securities, one commenter stated it “would strongly support inclusion of a half-penny spread bucket, or consideration of a separate small-tick pilot for highly liquid stocks.”

Another commenter recommended that the Pilot test a prohibition on “tiered pricing,” whereby exchanges offer lower per share fees or greater per share rebates to market participants that transact in greater volumes, believing that absent such a prohibition, exchanges would continue to offer these incentives, which would serve “to potentially work around the prohibition on offering rebates.”

Further, one commenter suggested adding a new Test Group “to test an anti-fragmentation policy,” in which “the order that sets the SIP NBBO receives the execution in all circumstances (e.g., bypassing hidden orders).” The Commission appreciates all of these recommendations. After considering these comments, as well as other comments opposed to including more NMS stocks in the Pilot, the Commission believes that the Pilot should not introduce additional variables. In order to add a new variable to the Pilot, the Commission would need to include additional Test Groups and materially increase the number of securities (or materially increase the Pilot’s duration) to be able to isolate separately the effects of each variable that is included in the Pilot. Otherwise, adding variables would create an asymmetric Pilot that would make it more difficult to evaluate the data and establish causal inferences regarding the impacts of changes to exchange transaction fees and rebates. As discussed above, most commenters were critical of the Pilot’s proposed size and the Commission similarly desires to have a narrowly tailored pilot focused on generating useful data on the impact of exchange fees and rebates on order routing behavior, execution quality, and market quality. Adding another variable to the Pilot would increase the Pilot’s size, complexity, and costs.

g. Gradual Reduction of Current Fee Cap Across All Stocks

One commenter suggested that, rather than conducting the Pilot, the Commission should instead amend Rule 610(c) to reduce the access fee cap to $0.0010 and also “conduct an abbreviated study of the effects of eliminating rebates similar to the criteria of Pilot Test Group Three.” This commenter stated that “there is broad recognition” that the access fee cap should be reduced and the Pilot will “be lengthy, complex and costly” but “will not yield a different conclusion.” The commenter stated that reducing the access fee cap to $0.010 would be calibrated with present-day trading and execution costs, would better ensure displayed prices reflect the actual economic costs of an execution, and would allow exchanges to continue maintain their current net capture rates, while also choosing to offer rebates to incentivize liquidity provision if they chose to do so.

The Commission believes that its revised Pilot design responds to this commenter’s core reason, though the Commission is instituting a $0.0010 fee cap as part of the Pilot and not as an amendment to Rule 610(c). The Commission continues to believe that a Pilot is necessary to provide data to objectively evaluate the effect of exchange fees and rebates. Ultimately, the Pilot will enable a data-driven analysis of the impact of transaction fees and rebates on order routing behavior, execution quality, and market quality, which will serve as a valuable precursor to the Commission’s consideration of future policy making in this area.

10. Metrics To Assess the Pilot

A number of commenters recommended that the Commission

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287 Pragmas Letter, at 4. See also Proposing Release, supra note 2, at 13055.
289 See Birch Bay Letter, at 2.
291 Id.
292 Id.
more clearly articulate what it believes would constitute a "successful" Pilot and how it will judge whether the Pilot achieves that measure of success. Several of these commenters suggested specific metrics or criteria they thought the Commission should analyze when evaluating the impact of the Pilot, many of which were measurement criteria suggested by EMSAC. One commenter suggested that the Commission provide guidance about how its staff will be evaluating the metrics used to determine whether to recommend market structure changes to the Commission following the Pilot. In addition, two commenters suggested the Commission designate an independent third party to conduct an analysis of the Pilot data upon the Pilot's completion. Another comment encouraged that the "industry should be afforded the opportunity to comment" on the metrics and criteria used to evaluate the Pilot.

In response to these comments, the Commission emphasizes that its staff will likely not be the sole entity analyzing data related to the Pilot. As was the case for the recent Tick Size Pilot, the Commission believes that market participants will publish their own analyses of the Pilot using data that is uniquely available to them and the metrics that they believe are most useful or relevant, and encourages market participants to do so. To the extent that interested parties prepare their own analyses, they may submit them to tradingandmarkets@sec.gov with the words "Transaction Fee Pilot Analysis" in the subject line, and the Commission will collect aggregated data, not individual order-by-order level data, and will therefore be unable to assess the execution quality of orders at the "parent" level. If market participants and other interested parties conduct parent-order level analyses and make their findings public, then the Commission would be able to consider them as it assesses the Pilot's ultimate impact on order routing behavior, execution quality, and market quality. See, e.g., T. Rowe Price Letter, at 4 (recommending that the Commission view analyses of the Pilot conducted by registered investment advisers as a "key input").

As noted in the Proposal, the Pilot is designed to produce an exogenous shock that simultaneously creates distinct fee environments, each of which restricts transaction-based fees or rebates differently, enabling synchronized comparisons to the current environment for purposes of inferring the existence of causal relationships. See Proposing Release, supra note 2, at 13047 and 33. An exogenous shock to a system occurs when an element of the system is changed from without the system (i.e., the change or shock is not under control or influence of those within the system) but can induce endogenous (i.e., within the system) responses. In the Pilot's context, the exogenous shock takes the form of a reduction of the maximum permissible transaction fees and a prohibition on rebates and Link Pricing for all U.S. equities exchanges. See infra Section IV.

For example, a Pilot that shows, with statistical significance, that rebates narrow the quoted spread in thinly-traded stocks would be equally "successful" as a Pilot that shows that rebates do not narrow the spread in such stocks. In this sense, the "success" of the Pilot is that it created the conditions that permit measurement and analysis of that issue in a manner that helps resolve speculative assumptions among the commenters about the impact of fees and rebates. Furthermore, it is worth noting that the data collected pursuant to Rule 610T is only part of what researchers will need to conduct analysis of the impact of exchange fees and rebates on the markets. For example, the Pilot's order routing datasets contain data to help assess order routing and certain aspects of execution quality, but will not contain certain data on quotations, which is available from existing sources. Consequently, researchers will need to use existing data sources to assess the impact of the Pilot on exchange quoting activity and market quality. As such, to the extent that the Pilot data produces null results, for example the Pilot's order routing datasets do not show any change in liquidity during the Pilot, the Commission believes that independent analysis from market participants, looking at order-level data, may nevertheless detect an impact. Even if the Pilot produces a null result for some metrics, and third-party analysis is not publicly available or does not find an impact, the Commission nevertheless believes the Pilot would still be useful to inform future policymaking that is intended to benefit investors. In response to commenters' requests for additional insight into the types of questions that the Commission hopes the Pilot will be able to answer, the Commission believes that the order routing datasets, as well as other data that is already readily accessible to researchers, should facilitate analysis of the impact of the Pilot through a broad spectrum of metrics. In particular, the Commission will consider, and encourages others to consider, the following questions in contemplating the impact of changes to fees and rebates across the exchanges. These questions include, but are not limited to:

For example, a result that shows no impact on liquidity for a Test Group may still be relevant to the Commission's consideration of the effects of transaction-fee and rebate pricing models on market order routing behavior, execution quality, and market quality and whether the existing exchange transaction-based fee and rebate structure continues to further the statutory goals.
1. To what extent do access fees and rebates impact routing decisions for liquidity-taking orders? Are orders to take liquidity more likely to be routed to an exchange (compared to an off-exchange venue or ATS) in a lower rebate environment than they are currently? 

2. To what extent do access fees and rebates impact routing decisions for liquidity-supplying orders? Are orders to provide liquidity less likely to be routed to an exchange (compared to an off-exchange venue or ATS) in a lower rebate environment than they are currently? 

3. What impact does a reduction or elimination in rebates have on the NBBO, including order width and the depth of interest displayed at the NBBO? To what extent does a potential decrease in depth of interest at the NBBO result in lower fill rates or smaller fill sizes for investor orders? Are natural investors better able to obtain queue priority in exchange order books, and are they more frequently able to capture the quoted spread when posting passively (e.g., buy on the bid and sell on the offer)?

4. Are there common characteristics for securities (e.g., average daily trading volume, price, or market capitalization) where a reduction or elimination of rebates begins to impact quoted spread? If so, what are those common characteristics and at what level do reduced rebates begin to have an impact on quoted spread? To what extent does a change in quoted spread affect transaction costs for investor orders? If quoted spread widens in a security, to what extent is the potential spread cost offset by the reduction in the transaction fees paid, or a change in the ability to quote spread?

5. Are there common characteristics for securities where a reduction or elimination of rebates does not impact quoted spread? If so, what are those common characteristics (e.g., average daily trading volume, price, or market capitalization)?

6. Are there common characteristics for securities (e.g., average daily trading volume, price, or market capitalization) where a reduction or elimination of rebates begins to impact quoted spread?

7. How can we best understand the effects of rebates provided on inverted venues (where rebates are paid to takers of liquidity)?

8. What impact do lower access fees and rebates have on the amount of displayed and non-displayed liquidity on exchanges?

9. In the absence of rebates, do competition and market forces operate to produce a market equilibrium (within the current regulatory structure) that constrains transaction fees to levels at or below today's current access fee cap? What do such market forces, and any resultant equilibrium pricing, tell us about the need to impose a cap on access fees? Does the Pilot provide any data that suggests, in the absence of rebates, an access fee cap would still be necessary as long as Rule 611 of Regulation NMS continues to impose order protection requirements on exchanges with protected quotes?

10. What is the impact of a lower fee cap on trading volumes on each exchange? What is the impact of a lower fee cap on other measures of liquidity on each exchange? How should we understand the difference between volume and liquidity?

11. What is the impact of lower rebates on the ability of smaller exchanges to attract liquidity-supplying orders?

By providing a mechanism that is uniquely capable of facilitating an empirical review of these and similar questions, the Pilot is an essential tool that can further the understanding of an important component of equities market structure. While other market structure issues also might benefit from a pilot, exchange transaction fees currently are a prime focus for empirical study, as evidenced by, among other things, the EMSAC’s recommendation to the Commission and the number and nature of comments the Commission received on its proposal. Ultimately, the Commission desires to use the Pilot’s results to help assess whether (and, if so, in which types of NASDAQ stocks) rebates have a positive impact on execution and market quality, or whether they have no little effect or a negative effect.

D. Timing and Duration

1. Disclosure Initiatives and the Pilot

While a number of commenters urged the Commission to proceed expeditiously with its proposed pilot, other commenters believed the Commission should pursue different market structure initiatives before conducting the Pilot or in lieu of the Pilot. The Commission has adopted two of the market structure initiatives identified by commenters—namely, proposals to enhance the operational transparency of ATSs and to enhance disclosure of order routing behavior.

While some commenters believed that the information and data from those new rules would complement the Pilot and “improve understanding of pilot data,” others believed the new rules would instead allow the Commission to undertake a “holistic examination of the Pilot without risking the potential negative impact of a pilot” or thought that potential conflicts of interest in order routing behavior would be better addressed through increased transparency and disclosure than by the Pilot.

The Commission disagrees. Comments urging the Commission to pursue disclosure-based initiatives focused only on one narrow aspect of...
the Pilot—studying the conflicts of interest between brokers and their customers that are presented when exchanges pay rebates. However, such an approach does not adequately advance the Pilot's broader purpose—obtaining a better understanding of all potential impacts from fees and rebates, and how fees and rebates may affect stocks differently depending on their liquidity.

Similarly, some commenters recommended that, either before conducting the Pilot or in lieu of the Pilot, the Commission should pursue other market initiatives such as enhancing broker-dealers' duty of best execution 314 or undertaking a "broader review of equity market structure," including the consideration of possible changes to the Order Protection Rule or the Minimum Tick Increment Rule.315 Other commenters disagreed and did not believe that the Commission should delay the Pilot in order to pursue other market structure initiatives.316 For example, a few commenters advocated proceeding with the Pilot because the Pilot may help to inform future policy changes in these other areas.317 Other commenters characterized the "holistic reform" advocated by other commenters as "an elusive goal"318 in light of market participants' competing interests—one that has been used to "slow down market structure reform for the past decade."319

The Commission believes that there is no need to delay proceeding with the Pilot in order to pursue other potential equity market structure initiatives. The Pilot seeks to resolve several equity market structure questions that have been debated for several years. Similarly, the Commission does not believe that it needs to complete the Pilot before proceeding to consider other equity market structure initiatives. Other initiatives may implicate equity market structure questions that are narrower or broader than, or independent of, exchange fee models, such as considering innovative approaches to thinly-traded securities.

The Commission expects that it will continue to evaluate the need for other changes to equity market structure during the Pilot.

2. Automatic Sunset at Year One

The Commission proposed that the Pilot have a duration of one year with a maximum period of two years. Specifically, the proposed Pilot duration featured an automatic sunset at the end of the first year unless, prior to that time, the Commission publishes a notice that the Pilot shall continue for up to one additional year.320

After careful consideration of the comments received, the Commission is adopting Rule 610T(c) as proposed.

Many commenters supported the proposed duration of the Pilot.321 For example, one commenter asserted that "each pricing experiment needs to be in place for a sufficient length of time to enable the test to adjust their routing logic."322 Others agreed that the proposed duration would reduce the "desire to 'wait out' the Pilot" and would avoid "the incentive to alter behavior in order to distort the Pilot's results . . . ."323 Several commenters supported the automatic sunset provision after one-year.324

A few commenters, however, thought the proposed duration was too short and that a minimum two-year pilot would be necessary.325 Some other commenters believed that the necessary data could be obtained within a shorter time frame. Among commenters advocating for a shorter Pilot Period, the recommended duration varied and ranged from those who felt there would be an "immediate and measurable impact upon implementation"326 to those who felt the appropriate time frame should be modified to an absolute maximum of one year.327 One commenter questioned whether a "1–2 year pilot that changes fees on 3,000 names" was "really a 'pilot' or in fact a de facto imposition of a significant reduction of transaction fees."328 Several commenters expressed their view that the proposed length of the Pilot would "exacerbate[] the negative impact upon the affected issuers."329

One commenter took issue with the proposed length of the Pilot by challenging what it believed to be conflicting statements of the Commission in its original Proposal. According to the commenter, the Commission asserted, on the one hand, that the "market quickly reacts to changes in (and elimination of) pricing changes, but on the other hand, claims that the market does not react unless the changes are in effect for a longer period of time and are not conflict. While many market participants will react promptly to pricing changes, particularly those with cost-based routing algorithms, others may need additional time to fine tune liquidity-based routing algorithms as order flow changes in response to fee changes.330 More importantly, however, the Pilot needs to be long enough to discourage any market participant inclined to resist adapting its behavior to the fee changes.331 A few commenters opposed the one-year sunset provision, but for a variety of different reasons. For example, one commenter thought a full two-year pilot was necessary, another thought the Commission separately has the authority to review or terminate the Pilot early and does not need a sunset.332

314 See, e.g., Nasdaq Letter I, at 3-4; Fidelity Letter, at 6; CBOE Letter I, at 21-22.
316 See, e.g., IEX Letter II, at 9; Better Markets Letter, at 3; Brands Letter, at 2; AIO Letter, at 2; OMEX Letter, at 3; Clearpool Letter, at 7. Some of these commenters suggested that the Pilot should proceed in conjunction with action on other market structure initiatives. See, e.g., SFIMA Letter, at 1; Pragma Letter, at 3-4.
317 See, e.g., Verrett Letter I, at 5; Better Markets Letter, at 3.
319 Themis Trading Letter I, at 6. See also ICI Letter I, at 3.
320 See Proposing Release, supra note 2, at 13025. The Commission notes that the proposed language in Rule 610T(c)(ii) has been modified slightly. As proposed, Rule 610T(c)(ii) contained the phrase "shall continue for up to one additional year." As adopted, the phrase "shall continue for up to one additional year" is being substituted for the phrase "shall continue for up to one additional year to simplify the rule without substantively changing the requirement.
321 See, e.g., SFIMA Letter, at 3; AGF Letter, at 2; Wellington Letter, at 2. See also RBCL Letter I, at 6 (stating "a pilot of at least one year and no more than two years will ensure that ample data is collected over time, that the restrictions of the various Pilot Test Groups cannot be evaded by delay, and that the Pilot does not exist for a period of time beyond which its data would be cumulative or of marginal significance relative to data produced earlier in the Pilot period").
322 See Citi Letter, at 5 (stating that "[c]ost-sensitive firms may be able to more quickly adapt to new pricing, while liquidity-based routers may need time to collect a new sample set to adjust their routing logic," such that "data in the weeks closer to the conclusion of the Pilot may more accurately reflect the state of the market and what the implications would be if implemented long-term"). One commenter, however, did not believe that certain "broker-dealers, proprietary traders, and algorithm vendors will incorporate the new fees into their routing systems on a timely basis, if ever," because according to this commenter, "[c]hanges are costly and may prove to be ultimately unnecessary if pricing reverts following the termination of the pilot study." Larry Harris Letter, at 11.
324 See, e.g., SFIMA Letter, at 3; CFA Letter, at 6; Fidelity Letter, at 9; IEX Letter I, at 4.
325 See Proposing Release, supra note 2, at 13071.
provision, and a third was critical of the lack of metrics that would accompany the automatic sunset.333

After careful consideration of the comments received, the Commission is adopting the Pilot’s duration as proposed. The Commission believes that the Pilot’s duration will provide an appropriate balance between providing certainty about the maximum duration for the Pilot while also allowing flexibility to conduct a Pilot for more than one year if necessary to collect representative data. Further, the Pilot’s duration should be long enough to make it economically worthwhile for market participants to adapt their behavior and not “wait out” the Pilot. In addition, in light of the number of Pilot Securities selected, which were selected to ensure sufficient statistical power to allow for meaningful analysis, the Pilot’s duration will allow for the collection of a robust and representative data set over a sufficiently long period of time. The Commission considered a shorter time period for the Pilot, but is concerned that short-term or seasonal events could unduly impact the Pilot results and therefore data collected over a shorter duration may not yield a sufficiently representative dataset that would be capable of permitting analysis into the impact of 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. For example, a shorter pilot period could be impacted by seasonal idiosyncrasies, macroeconomic factors, or even weather events.

Further, the Commission recognizes that some market participants, for example, broker-dealers whose liquidity-focused routing strategies are based on, and continually updated based on, several weeks’ worth of data, will need time to fine tune their revised routing strategies. While some market participants may adjust quickly, others, like proprietary trading market participants, may want to see how other market participants react before refining their own routing strategies.334 In other words, it could take a few months before some market participants finish calibrating their routing strategies to the fees and rebates that the exchanges adopt consistent with the Pilot’s requirements and then respond accordingly, which could further delay the time it takes for broker-dealers to adjust their routing and trading algorithms. Accounting for all of this, the Commission intends that the proposed duration of the Pilot be long enough to encourage wide participation by all market participants (and discourage “waiting out” the Pilot) and thereby help ensure that the Pilot produces results that are more reliable, robust, and useful.

The Commission also considered extending the Pilot period to two-years as suggested by several commenters, and as was recommended by the EMSAC, but continues to believe that the inclusion of the automatic sunset provision at the end of the first year is preferable because it will provide flexibility in the event that the Commission believes additional time is necessary to ensure the collection of a robust dataset with adequate statistical power for analysis, but will allow the Pilot to automatically end after one-year in the event that sufficient data is collected by that point with sufficient statistical power to allow for meaningful analysis.

3. Pre- and Post-Pilot Periods

The Commission proposed a six-month pre-Pilot Period as well as a six-month post-Pilot Period.335 During those periods, the Commission proposed to require the equities exchanges to collect and make available the order routing datasets and Exchange Transaction Fee Summaries in order to provide necessary benchmark information against which researchers could assess the impact of the Pilot.336 Two commenters supported the proposed six-month pre-Pilot and post-Pilot data collection periods.337 In contrast, two commenters suggested adopting three-month long pre-Pilot and post-Pilot Periods.338 The Commission desires to implement the Pilot in a manner that imposes the least amount of costs on the exchanges without compromising the ability of the Pilot to obtain useful data. The Commission believes that six-month pre- and post-Pilot Periods are necessary to establish a baseline against which to compare the data collected during the Pilot Period and any post-Pilot effects following the conclusion of the proposed Pilot. Although the Commission appreciates the desire of market participants to expedite the Pilot while constraining costs, the Commission considers six months to be necessary to provide the targeted statistical power for obtaining baseline data. As discussed above, statistical power largely is a function of the number of observations over a specified period of time. In order to shorten the pre- and post-Pilot Periods (e.g., to three months instead of six months) while maintaining the same statistical power, the Commission would need to increase the number of securities in the Pilot by at least 120 securities. As discussed above and consistent with the comments the Commission received, the Commission desires to limit, not increase, the number of securities included in the Pilot. Accordingly, the Commission is not adopting a shorter duration for the pre- and post-Pilot Periods.

4. Early Termination

Proposed Rule 610T did not contain a specific provision regarding early termination of the Pilot. Several commenters recommended that the Commission develop specific criteria for evaluating the possibility that the Pilot may need to be terminated early.339 Some recommended that the Pilot specifically include a “kill switch” to effectuate an early termination.340 Several commentators supported the need for the Commission to address unanticipated negative consequences quickly.341 but one commenter cautioned that the Commission would need to act in a measured manner because the industry would need time to unwind the Pilot.342 One commenter suggested that the Commission might want to terminate the Pilot early if (1) it produced a “robust statistical sample set earlier than a year, such that [the Commission could] end the Pilot and proceed to adopt permanent rule changes” and (2) “if there is unintended impact from the Pilot that warrants a

333 See Babelfish Letter, at 3; Healthy Markets Letter I, at 19; Choe Letter I, at 19.
334 See, e.g., Chli Letter, at 5.
335 See Proposing Release, supra note 2, at 13025-26. See also Proposed Rule 610T(c).
336 Proposed Rule 610T(d) and (e). See also Proposing Release, supra note 2, at 13029, 13032. Primary listing exchanges will also be required to prepare and publicly post updated Pilot Securities Exchange Lists and Pilot Securities Change Lists for the duration of the Pilot Period and through the post-Pilot Period. Id. at 13027–28. The pre-Pilot data is intended to establish a baseline against which to assess the effects of the Pilot, while the post-Pilot Period is intended to help assess any post-Pilot effects following the conclusion of the Pilot.
339 See e.g., SIFMA Letter, at 3; Issuer Network Letter I, at 4; State Street Letter, at 4; Choe Letter I, at 28.
340 See Citi Letter, at 4; TD Ameritrade Letter, at 1, 5; Morgan Stanley Letter, at 4; Choe Letter I, at 28–29; Vanguard Letter, at 3; STANY Letter, at 4; Angel Letter II, at 3.
341 See Schwab Letter, at 2; Cboe Letter I, at 29.
342 See TD Ameritrade Letter, at 5. See also Morgan Stanley Letter, at 4; SIFMA Letter, at 3.
stoppage." 343 Other commenters emphasized the need for the Commission to closely monitor the impact of the Pilot on retail investors in particular. 344 For example, one commenter argued that if the Pilot data suggests “clear harm to the retail investor in . . . relevant execution quality metrics” like “quoted spread, depth of liquidity, intraday stock volatility, and opportunities for price improvement on impacted securities,” then the Pilot “should be immediately suspended.” 345 Another commenter urged the Commission to closely monitor the Pilot’s effect on thinly-traded stocks and establish “predetermined means for discontinuing the Pilot in the event that the reviewed data shows undue harm to market or execution quality.” 346

However, one commenter raised that the Commission is not obligated to “cease the Pilot if the costs to liquidity prove significant.” 347 The Commission acknowledges the concerns raised by commenters regarding the potential for unintended and unanticipated consequences to the equities markets that the Pilot may have. The Commission intends to carefully monitor for any such effects during the Pilot Period. However, the Commission does not believe that it is necessary to add a “kill switch” to Rule 610T because the Commission already has broad exemptive authority that obviates the need for a separate kill switch. For example, if at any time the Commission believes that the protection of investors may be compromised by the Pilot, the Commission has broad authority under Section 36 of the Exchange Act to modify or terminate the Pilot early. 348

5. Inclusion of a Phase-In Period

The Commission did not propose a phase-in period for the Pilot. Three commenters recommended a phase-in period without elaborating on its purpose, though they referenced the EMSAC’s recommendation for an initial three-month phase-in period involving 10 stocks. 349 A different commenter did not believe that the EMSAC’s three-month phase-in period was necessary. 350 The Commission has considered these comments and believes a phase-in approach is not necessary and unnecessarily would add to the length of the Pilot. Although such an approach would allow the 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 continues to believe that, because exchange fees can become immediately effective upon their filing with the Commission, the markets and market participants are accustomed to dealing with immediate fee changes in which fees can change on all stocks at once, or only for a subset of stocks or a subset of trading mechanisms. Accordingly, exchanges and market participants should be capable of accommodating the terms of the proposed Pilot with the advance notice contemplated by the Pilot. Further, although exchanges would be required to collect and report certain data, the proposed Pilot would not necessitate changes to exchange trading systems, and therefore, the Commission continues to believe a phased implementation schedule is not necessary to test the types of changes contemplated by the Pilot.

E. Data

The Commission proposed that certain data be collected and made publicly available in order to facilitate the Commission’s and researchers’ ability to assess the impact of the Pilot, as well as to promote transparency about the Pilot Securities and to provide basic information about equity exchange fees and changes to those fees during the Pilot. 351 The Commission is adopting the Pilot Securities Lists, the Exchange Transaction Fee Summary, and the order routing datasets subject to the modifications described below.

1. Pilot Securities Exchange Lists and Pilot Securities Change Lists

As proposed, the Commission would publish, approximately one month before the start of the Pilot Period, the initial List of Pilot Securities, which identifies the securities in the Pilot and their designated Test Group (or the Control Group). 352 Thereafter, each primary listing exchange 353 would publish a freely and publicly available daily Pilot Securities Exchange List of the Pilot Securities that are primarily listed on its exchange and also publish a Pilot Securities Change List of the cumulative changes to that list, and keep both lists available on their websites for five years. 354

The Commission received one comment that was supportive of the proposed requirements for disseminating and updating the Pilot Securities lists, including the pipe-delimited ASCII file format and the five year retention period. 355 This commenter also had “no objections to the proposed posting requirements, providing there is adequate data security and controlled access.” 356 The Commission is not adopting any new requirements for data security with respect to the Pilot Securities lists because that data is not private or otherwise sensitive in nature and because the exchanges already are subject to Regulation SCI governing access to their systems that support trading. 357

For the reasons stated in the Proposing Release, the Commission is adopting as proposed the requirements in Rule 610T(b) for the primary listing exchanges to publicly post on their websites downloadable files containing the Pilot Securities Exchange Lists and the Pilot Securities Change Lists. 358 The Commission is adding one additional

343 See Vanguard Letter, at 3. See also Angel Letter II, at 3 (noting that the Pilot could be suspended quickly if “there is abundant evidence one way or the other about the results,” such as “a dramatic increase in market quality for one particular treatment group,” in which case “that particular group’s treatment could become the new rule,” or “if the pilot produces fast and unequivocal results showing harm to one particular treatment group, that treatment should be halted”).

344 See Schwab Letter, at 2; Citit Letter, at 4.


346 See STANY Letter, at 4.

347 Verret Letter I, at 5.

348 See 15 U.S.C. 78mm (setting forth the Commission’s authority, by rule, regulation or order, to conditionally or unconditionally exempt persons, transactions or securities (or classes thereof) from any Exchange Act provision, rule or regulation if necessary or appropriate in the public interest and is consistent with the protection of investors).


350 See AJO Letter, at 2.

351 See Proposing Release, supra note 2, at 13026.

352 See Proposed Rule 610T(b)(1). See also Proposing Release, supra note 2, at 13026. When the Commission publishes this list, the pre-Pilot Period will have been in place for approximately five months.


354 See Proposing Release, supra note 2, at 13027–28. The Commission notes that the proposed language in Rule 610T(b)(3)i) has been modified slightly. As proposed, Rule 610T(b)(3)i) contained the phrase “‘throughout the duration of the Pilot, including the post-Pilot Period.’” As adopted, the phrase “‘throughout the end of the post-Pilot Period’” is being substituted for the phrase “‘throughout the duration of the Pilot, including the post-Pilot Period’” to simplify the rule text without substantively changing the applicability of the posting requirement.

355 See FIF Letter, at 5.

356 Id.

357 See 17 CFR 242.1010(a)(1). SCI systems include all computer, network, electronic, technical, automated or similar systems of, or operated by or on behalf of, an SCI entity that directly support activities such as trading and order routing, among other things. 17 CFR 242.1000.

As discussed in the Proposal and above, the Commission will stratify Pilot Securities as it assigns them to the Test Groups and Control Group to ensure that each group has a similar composition, which facilitates comparison across groups. As it does so, the Commission will assign a stratum code to each Pilot Security that identifies that security’s liquidity stratum. The code is a static value and, as such, will remain constant throughout the Pilot. The Commission will include this stratum code on the initial List of Pilot Securities that it disseminates. To link each Pilot Security and its stratum code, the Commission is requiring the primary listing exchanges to include this data element on each Pilot Securities Exchange List and Pilot Securities Change List. Including this field on each list will clearly identify each Pilot Security’s liquidity stratum, thereby allowing researchers to control for the fact that within some liquidity strata, the ratio of Test Group stocks to Control Group stocks is lower than it is for others, which should facilitate analysis of the Pilot’s data.

2. Exchange Transaction Fee Summary

As proposed, each exchange that trades NMS stocks would be required to compile, update monthly, and make freely and publicly available a dataset using an XML schema published on the Commission’s website that contains specified information on its fees and fee changes during the Pilot.

In particular, each exchange would identify, among other things, 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, as well as the Pilot Group (i.e., 1, 2, or Control) that applies to the fee being reported. Exchanges also would 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, reported separately for each participant category (registered market makers or other market participants), Test Group, displayed/non-displayed, and top/depth of book.

In the Proposing Release, the Commission asked several questions about the Exchange Transaction Fee Summary including questions about the proposed form, content, and posting requirements. Commenters supported requiring the equities exchanges to publicly post the Exchange Transaction Fee Summary as well as the proposed fields included in the summaries.

Among those requests included in the Proposing Release, the Commission specifically asked commenters to suggest types of information that should be captured on the Exchange Transaction Fee Summary that would be useful to make comparisons across exchanges, and a few commenters offered specific suggestions. Specifically, two commenters requested that the Exchange Transaction Fee Summary include the number of pricing tiers used by the exchanges, the number of firms that were in each tier, and information on transaction costs in each tier. Similarly, another commenter suggested that the Exchange Transaction Fee Summary provide context on the Base and Top Tier fees by including the number of member firms, by participant type, that qualified for the Base and Top Tier fees and rebates reported on the Exchange Transaction Fee Summary. While the Commission appreciates these suggestions, it believes that adding more granular details about specific pricing tiers, which can vary greatly by exchange, would overcomplicate the fee summaries such that it would be difficult to standardize the information, thereby rendering the data less useful to researchers when comparing exchanges for purposes of the Pilot. Further, with respect to the number of members qualifying for the Base and Top Tier fees and rebates, the Commission believes that the information that exchanges will report on average and median realized fees and rebates should be sufficient for purposes of analyzing the Pilot’s results, including any changes in order routing. We believe that the disclosure of the number of members qualifying for the Base and Top Tier fees and rebates would also require other disclosures including, e.g., such member’s trade volume at each tier) in order to provide context to the information. Providing all of these additional data points would increase the costs and complexity of the Pilot. The Commission however, does not believe that the incremental benefit of this information justifies additional costs and complexities. Accordingly, the Commission will not be requiring the exchanges to include additional information on their pricing tiers.

As part of its request for comment in the Proposal on what additional information would be helpful to include in the Exchange Transaction Fee Summary, the Commission specifically asked whether other measures beyond average and median fees should be selected. In response, one commenter recommended that in addition to requiring the average and median per share fees and rebates, the Commission also require the “mode” per share fee and rebate (i.e., the most frequently paid fee and rebate by each exchange’s members), because the commenter believed it would “enable a more accurate comparison of the fees and rebates most often applied by each exchange.” The Commission appreciates this suggestion, but continues to believe that for purposes of this Pilot, the proposed information on mean and median realized fees and rebates will be sufficient for purposes of analyzing the results of the Pilot, including any changes in order routing.

Lastly, a few commenters requested that the Exchange Transaction Fee Summary information be hosted at a central location rather than posted on the exchanges’ individual websites. While the Commission recognizes that it could be more convenient if the information were made available in one central location, because the data must be made available unencumbered and in a standardized XML schema format, the Commission believes that any person would readily be able to obtain and combine the summaries posted by each equities exchange with minimal effort.

359 The Commission is modifying the name of the field specified in proposed Rule 610T(b)(2)(ii)(E). The Commission proposed the field be named “Test Group.” As adopted, the field will be named “Pilot Group” to provide additional context on the Pilot’s data.

360 See Proposing Release, supra note 2, 13019, 13051.

361 The Commission notes that the proposed language in Rule 610T(e) has been modified slightly. As proposed, Rule 610T(e) contained the phrase “each national securities exchange that trades NMS stocks. . . .” As adopted, the clause “that facilitates trading in NMS stocks” is being substituted for the phrase “that trades NMS stocks” to clarify that exchanges facilitate trading by their members in NMS stocks. In addition, the Commission notes that, as proposed, Rule 610T(e) contained a parenthetical which explained that data requirements get the data element described in subsection (e) were “applicable to securities having a price greater than $1.” As adopted, that parenthetical has been modified slightly to clarify that the requirements of subsection (e) apply to “securities having a price equal or greater than $1.”
Because of this, the Commission is not adopting a requirement on exchanges to consolidate this material and make it available in a central location.

3. Order Routing Data

To facilitate an examination of the impact of the Pilot on order routing behavior, execution quality, and market quality, the Commission proposed to require throughout the Pilot (including during the pre-Pilot Period and the post-Pilot Period) that each equities exchange prepare and publicly post a monthly downloadable file containing sets of anonymized order routing data in accordance with the specifications proposed in Rule 610T(d).

Specifically, Rule 610T(d) would require exchanges to provide the order routing information in two datasets: one for liquidity-providing orders and one for liquidity-taking orders, both aggregated by day, security, and broker-dealer.

The Commission further proposed that equities exchanges would be required to anonymize the identity of individual broker-dealers before making the order routing datasets publicly available, using an anonymization key provided by the Commission.

A number of commenters supported the proposed requirements regarding the order routing datasets, expressing the belief that these requirements would provide researchers with useful data that would facilitate an analysis of the impact of transaction fees and rebates on order routing, execution quality, and market quality.

Several commenters believed the data would enable the Commission to make data-driven decisions on potential future equity market structure policy initiatives.

Others specifically supported the website posting requirement to make the data freely and publicly available.

In addition, other comments addressed matters such as: Separating held and not-held orders in the datasets, separating principal from agency orders in the datasets, and not collecting "parent order" routing information. Other commenters expressed concern that not collecting similar data from non-exchange venues would decrease the utility of the data and provide the Commission with an incomplete picture of the Pilot's impact.

Other commenters were critical of the proposed order routing data requirements because they believed, despite the anonymization and aggregation requirements, that publicly available data could be reverse-engineered to reveal commercially-sensitive information about individual broker-dealers.

These concerns are discussed further, below.

a. Held and Not-Held Orders

The Commission proposed to require exchanges to separate out held and not-held orders in the order routing datasets and requested comment on whether orders should be separated out in that manner and whether there are certain shared characteristics of such orders that would be beneficial to assess when analyzing the Pilot data.

In response, several commenters stated that exchanges currently do not capture whether orders are held or not held.

Two commenters added that capturing information that would impose additional costs on market participants who would need to update their systems to include this information in the order messages they send to exchanges, as well as impose additional costs on exchanges to capture and report whether an order is held or not held.

The Commission has considered these comments and has determined not to require the exchanges to separate held and not-held orders in the order routing datasets. In proposing to require capture of held and not-held orders, the Commission sought to include a data field that is readily available to and currently captured by exchanges and that would provide insight into the capacity in which a broker-dealer is handling orders. In turn, that information could be useful to assess the broker-dealer's routing of those orders. For example, orders that are "held to the market" may be routed differently than orders that are "not held" and for which the broker-dealer exercises more discretion in their execution. By separating out these orders, researchers would have access to an additional metric that potentially could be helpful in analyzing the Pilot data and parsing the results.

As commenters have indicated, however, broker-dealers do not transmit information to exchanges and exchanges thus do not capture it. The Commission does not wish to impose new data collection requirements with respect to this Pilot data field, and therefore is not adopting this element. However, as detailed below, the Commission is adopting a new requirement for exchanges to instead separate out orders based on their order capacity (e.g., principal, riskless principal, and agency), which information currently is transmitted to exchanges by broker-dealers.

b. Principal Order Flow and Order Capacity

In response to the Commission's question in the Proposing Release about whether data are necessary to facilitate an analysis of the potential conflicts of interest associated with transaction fees and rebates, several commenters requested that the order routing datasets exclude orders marked as principal or riskless principal because the potential conflicts of interest posed by exchange transaction fees and rebates pose a potential harm primarily when broker-dealers are routing orders for customers in an agency capacity and may be unduly influenced by exchange fees and rebates to the detriment of obtaining the best execution for the customer's order.

To the extent a broker-dealer is routing its own proprietary orders and is unduly influenced by exchange fees and rebates, then, at worst, it would only be harming itself. In other words, as noted by one commenter, "a broker may route principal orders to maximize rebates and minimize access fees which would not be considered a conflict of interest."

Without separating out orders by their order capacity, one commenter argued that the order routing datasets could generate "misleading results" because the trades of various market participants could be aggregated at the same broker.
due to "direct market access arrangements," and these orders would be indistinguishable from customer orders routed by that broker. In this way, agency orders (which are subject to conflicts of interest concerns that are relevant to the Pilot) could be mixed in with principal orders (which are not subject to conflicts of interest concerns that are relevant to the Pilot) and the inability to distinguish them could cloud the results. Accordingly, one commenter recommended separating principal and agency orders in the order routing datasets, while continuing to include both types of order flow. The commenter believed that specifically identifying the extent to which orders are principal orders or agency orders "would further facilitate the analysis of order flow and a better understanding of the efficacy of the [Pilot]." 390

After careful consideration of these comments, the Commission has determined to require exchanges to separate out orders by order capacity (e.g., principal, riskless principal, and agency). Requiring exchanges to separately aggregate orders according to their order capacity will allow researchers to more precisely parse the data as recommended by several commenters, particularly when analyzing the potential conflicts of interest in broker-dealer routing presented by exchange fee-and-rebate pricing models. For example, researchers will be able to separate out and exclude principal orders when studying conflicts of interest, as conflicts of interest do not present the potential for harmful impact with respect to such orders as they do for agency orders where the broker-dealer is routing for others. In addition, researchers will be able to include orders of any order capacity when studying other questions, such as intermediation, queue length, and time to execution, as such issues are relevant to orders of any capacity.

Further, the Commission believes that principal orders should be included in the order routing datasets, as the Pilot is designed to assess more than just conflicts of interest between brokers and their customers in order routing. It also is designed to observe the impact of exogenous shocks to transaction fees and rebates on execution quality and market quality broadly. Accordingly, the Pilot will provide the opportunity to obtain useful data on matters such as

intermediation, queue length, and time to execution; the impact of fees and rebates on liquidity adding and liquidity removing activity; the relationship between payment of rebates on making activity (or taking activity on an inverted exchange) and fee levels for taking activity (or making activity on an inverted exchange); and the impact of fees and rebates on order routing behavior generally. Consideration of these issues directly implicates principal order flow and, as such, the Commission believes it is critical for the aggregated volume statistics included in the order routing datasets to include principal orders.

C. Order Designation

In response to questions in the Proposing Release on specific measures and data that would facilitate an analysis of the effects that changes to transaction fees and rebates have on order routing behavior, execution quality, and market quality, several commenters recommended that the Commission analyze the impacts of fees and rebates on various aspects of the execution quality of investors' limit orders. Further, on the impact that prohibiting rebates may have on quoted spreads and displayed liquidity, commenters also disagreed about the willingness and ability for investors, other than those that are motivated by rebate capture, to post liquidity in order to capture the quoted spread. In addition, in attempting to utilize transaction data to analyze the impact of reduced or eliminated rebates, one commenter recommended that the dataset exclude orders that presently are not eligible for rebates, such as those designated for participation in opening and closing auctions.

While analyzing the impact of reduced or eliminated rebates is one potential analysis for which the Pilot's data may be useful, the Pilot's purpose is broader in scope. As such, the Commission continues to believe that it is appropriate for the order routing datasets to capture all liquidity-providing and liquidity-taking orders. However, in response to the commentators' recommendations discussed above and in an effort to ensure that the order routing data be as useful as possible and facilitate an analysis of the impacts of the Pilot, the Commission has determined to further refine the order routing dataset by requiring exchanges to report separately the volume statistics by "order designation," which will require exchanges to separate out post-only orders as well as auction orders.

Separating the volume statistics in this manner will allow isolation of the cumulative number of post-only orders, which are limit orders that include instructions to never remove liquidity, and may be more reflective of a rebate-sensitive market participant. With the data further refined in this manner, the Commission believes the data will be more useful in analyzing the impacts of the Pilot both in comparing the pre-Pilot dataset to the Pilot data and in comparing the data across the Test Groups and Control Group during the Pilot. In particular, the further refinement will facilitate assessment of the impact of the Pilot on the willingness of investors to passively post orders and their ability to obtain queue priority (i.e., represent the best price in the exchange's limit order book) and capture the quoted spread when doing so (i.e., buy on the bid and sell on the offer).

Furthermore, with respect to auction orders, which are orders specifically designated for execution in either an opening or closing auction, instead of separating out auction orders, exchanges may instead elect to simply exclude them from the order routing datasets, as an alternative means of complying with the order designation requirement. The Commission has determined to allow the exchanges to choose between these two approaches so that they may choose the option that is the least burdensome. If exchanges choose to include auction order data in the order routing datasets, they will need to comply with the requirement by separating orders by order designation, so that these orders may be separately identified and accounted for in any analyses of the Pilot's data.

The ability to isolate auction orders recognizes the uniqueness of the auction process and will facilitate separation of that data in order to study the Pilot's impact on trading during the regular market session without potentially biasing the results by including auction activity, for which different trading rules, order types, and fees apply.

390 See FIA Letter, at 3 fn. 9.
393 See supra note 224-225 and accompanying text.
394 See supra Section II.C.10.
d. Broker Routing Data

Several commenters addressed the utility of obtaining order routing data from broker-dealers that route customer orders in assessing the potential conflicts of interest related to transaction fees and rebates.395 Several of these commenters explained that obtaining data from broker-dealers (in addition to or in place of obtaining such data from exchanges) would facilitate an analysis of the impact of transaction fees and rebates on order routing behavior and potential conflicts of interest from the perspective of customers. The brokers would have information that can be used to assess the execution quality of a “parent order” and would provide information on the broader universe of potential routing destinations, including non-exchange trading venues.396 One commenter added that investors needed to conduct their own analyses of their orders to understand the impact of the Pilot on their brokers.397

The Commission is not requiring data collection from broker-dealers or non-exchange trading venues. The order routing datasets will include aggregated data from exchanges (as opposed to individual order level data from broker-dealers) representing the sum totals of the “child” orders that are processed by an exchange. While the Pilot will not capture the entire lifecycle of a “parent” order from its inception, the Commission believes that its approach will minimize the implementation costs on market participants while ensuring that the Commission and researchers have useful data on child orders to observe the impacts of introducing exogenous shocks to exchange transaction fees and rebates. The order routing data provided by the exchanges represents the information that would be directly correlated to these exogenous shocks. Data that is available elsewhere398 will provide the ability to understand any observed changes in order flows or market share to non-exchange venues during the Pilot.

Further, the Commission agrees with the commenters that noted that market participants need to conduct their own analyses of their own order flow. If market participants conduct their own analyses, including parent order-level analyses, and wish to provide that information to the Commission and the public, the Commission would be able to consider the information in assessing the Pilot’s ultimate impact on order routing behavior, execution quality, and market quality. The Commission encourages market participants to conduct analyses and make the results of their analyses public. The Commission also encourages any interested party that prepares an analysis of the Pilot to submit it to the Commission for posting on the Commission’s website.399

Two commenters recommended that the order routing datasets identify whether orders are directed or non-directed.400 One of these commenters believed that directed orders do not feature “the same level of discretion and conflicts of interest that are the primary focus of the Pilot.”401 After careful consideration of these comments the Commission has determined not to require the order routing datasets to identify directed orders. The Commission recognizes that researchers may be interested in isolating orders directed by customers to specific exchanges because these orders may not be subject to the same potential conflicts of interest that may be present when a broker chooses where to route a customer order. However, separating out directed orders in the datasets (which report aggregated data and not order-by-order data) would require exchanges and broker-dealers to incur additional costs in preparing the Pilot’s order routing data. Further, the Pilot is designed to assess more than just conflicts of interest between brokers and their customers in order routing, and separate identification of directed and non-directed orders is not germane to the other questions the Pilot is designed to explore. Accordingly, the Commission believes that the additional implementation costs that adding such a requirement would impose are not justified by any benefits that may accrue from identifying, on an aggregated basis, directed orders in the order routing data.

f. Utilizing the Consolidated Audit Trail

Two commenters recommended that, instead of requiring separate order routing datasets, the Commission instead use data that the equities exchanges will report to the Consolidated Audit Trail (“CAT”).402 In the Proposing Release, the Commission stated that if the equities exchanges are reporting to the CAT at the time the Pilot commences, they would be able to compile the order routing datasets by utilizing the data they collect pursuant to the CAT national market system plan.403 However, there have been delays in the development and building of the CAT, and the reporting required by the first phase of the CAT NMS Plan has been delayed. Although the exchanges and FINRA have recently begun to report certain data to the CAT central repository, they continue to work to fully implement the first phase of the CAT NMS Plan, including linkages between reported events and regulators’ query functionality. The Commission believes that it is important to proceed with the Pilot and not delay the Pilot until the exchanges have begun full reporting to the CAT and the CAT operates in a manner that would facilitate the data analysis contemplated by the Pilot.

g. Anonymization and Public Availability

Several commenters expressed concerns about having the exchanges publicly post the order routing datasets, despite the requirement that the exchanges anonymize the identities of broker-dealers before making the datasets publicly available. These commenters believed that the order routing data could potentially be “reversed engineered” such that market participants might be able to ascertain the identities of individual broker-dealers in some circumstances. In contrast, one commenter acknowledged that ensuring confidentiality is “critical” and was “pleased to see that the SEC has recognized this in proposing anonymizing certain of the proposed data to protect confidential information.”405

Of the commenters concerned about the potential for reverse engineering, one of these commenters provided an example of how the information could be utilized to protect confidentiality.

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397 See Babelfish Letter, at 3.
399 See supra note 302 and accompanying text.
400 See supra note 2, at 13031 n.172 and accompanying text.
401 See, e.g., FIA Letter, at 3; Virtu Letter, at 7–8; SIFMA Letter, at 6; FIF Letter, at 2; Citadel Letter, at 4; Citi Letter, at 6; TD Ameritrade Letter, at 5; SVENY Letter, at 5; S&D Letter, at 1; Credit Suisse Commentary, at 6; Morgan Stanley Letter, at 4.
be reverse engineered if “a market participant could direct a large order in a particular symbol to a specific broker-dealer, and then identify the presence of that order” in the order routing datasets. 406 This commenter added that market participants may also be able to compare the order routing datasets with reports published pursuant to 17 CFR 242.606 (Rule 605 of Regulation NMS) to determine the identity of broker-dealers. 407 Once a broker-dealer’s identity is likely known, this commenter believed that competitors could use the order routing datasets to discern that broker’s “(a) market share and activity in a given security, (b) overall routing practices, and (c) relative aggressiveness or passiveness in specific securities.” 408 This commenter also believed that strategies used by institutional investors that are customers of broker-dealers “may also be susceptible to reverse-engineering.” 409 Another commenter added that it believed “market participants and others will be able to identify certain broker-dealers routing strategies by comparing the Pilot data to publicly available 17 CFR 242.606 (Rule 606) disclosures, or by other means,” although it did not specify those other means. 410

Several of the commenters that expressed concern about the public availability of the order routing data, despite the proposed anonymization requirements, recommended approaches to address their concerns. Some of these commenters stated that the Commission should receive order routing data at the broker-dealer level, but that the public should only have access to data that is further aggregated, such that the data would include statistics for firms of similar types or business models, or simply aggregate all orders received by the exchange. 411 However, in contrast, two commenters noted that the order routing data aggregated by broker would be important to analyses undertaken by researchers and therefore should be made more broadly available. 412 Two other commenters suggested that if the order routing data aggregated by broker would be helpful for researchers, the Commission should provide that data to researchers only if they sign a non-disclosure agreement. 413 In addition, three commenters recommended that if order routing datasets are to be made publicly available on exchange websites, they should be subject to a 120 day delay instead of a 30 day delay. 414

The Commission appreciates commenters’ concerns about the need to safeguard the confidentiality of the order routing datasets. The Commission agrees that if market participants were able to identify broker-dealers in the datasets, there is the potential that the data could be reverse engineered to reveal proprietary information about trading attributable to specific broker-dealers. The Commission has revised its approach to eliminate the public availability of the order routing datasets to help address these concerns, while still furthering the goals of the Pilot. More specifically, to address commenters’ concerns with the public availability of the data and the exchanges’ role in preparing it for dissemination, the Commission is not adopting the requirement for the exchanges to anonymize and publicly post the order routing data.

The Commission, however, believes it is important for the Commission itself to have access to the order routing dataset, so the Commission can consider the effects of rebates and transaction-based fees on order routing behavior, execution quality, and market quality. Accordingly, given the potential for reverse engineering, the Exchanges will be required to provide order routing data directly to the Commission. While the Commission anticipated benefits from market participants, researchers, and others in conducting independent analysis of the Pilot and its impacts, the Commission has carefully balanced the concerns about possible reverse engineering of the order routing data against these benefits. The Commission believes that it can assess the effects of the transaction-fee and rebate models on order routing behavior and thereby achieve this goal of the Pilot without requiring public disclosure of order routing data attributable to a specific broker-dealer.

The Commission is not adopting the requirement for exchanges to make public in an anonymized form the order routing data, but the exchanges will instead identify individual broker-dealers by MPIID or CRD number in the order routing data they send to the Commission. The Commission recognizes that order routing data attributable to a specific broker-dealer is particularly sensitive and is non-public information. 415 The Commission, however, intends to make public analyses, results, and studies using the order routing data. In determining whether and how to make public this or any other information, the Commission will be sensitive to the concerns articulated by commenters and will consider steps such as aggregating or anonymizing order routing data. Specifically, the Commission is adopting a requirement for each exchange to prepare and transmit directly to the Commission, in pipe-delimited ASCII format, no later than the last day of each month, a file containing sets of order routing data. 416 While the Commission is not requiring the exchanges to anonymize the data and thus will no longer provide exchanges with the Broker-Dealer Anonymization Key, the Commission is requiring each exchange to provide its order routing data by broker-dealers’ CRD number and MPIIDs in order to provide aggregated broker-dealer level data to the Commission to facilitate its analysis of the data.

The Commission believes that the suggested alternative to further aggregate the datasets, for example, to combine the data of several firms together or combine all firms together, would seriously compromise the ability of researchers to investigate the potential conflicts of interest in routing because researchers would not be able to see an individual broker-dealer’s orders across all exchanges and thereby would not be able to assess how any particular broker-dealer may have been influenced by fees and rebates at

407 See id.
408 Id.
409 Id.
410 See TD Ameritrade Letter, at 5.
411 See, e.g., Citadel Letter, at 4; Credit Suisse Commentary, at 6; IEX Letter I, at 10; Morgan Stanley Letter, at 4; STANY Letter, at 5; SIFMA Letter, at 6–7; TD Ameritrade Letter, at 5; PIF Letter, at 7.
412 See Lipson Letter, at 1; Spatt Letter, at 3.
413 See Citadel Letter, at 5; Citi Letter, at 6.
414 See SIFMA Letter, at 7; STANY Letter, at 5; Fidelity Letter, at 8.
415 Several commenters expressed concerns that the equities exchanges would have access to the Broker Dealer Anonymization Key. See, e.g., Virtu Letter, at 8; SIFMA Letter, at 7; PIF Letter, at 2; STANY Letter, at 5; IEX Letter I, at 10; Morgan Stanley Letter, at 4. As adopted, the exchanges would not have access to the Broker Dealer Anonymization Key, which addresses the commenters’ concerns.
416 The Commission will deem broker-dealer identifying order routing data as being subject to a confidential treatment request under 17 CFR 200.83 without the need to submit a request. The Freedom of Information Act provides at least two potentially pertinent exemptions under which the Commission has authority to withhold certain information. See 5 U.S.C. 552(b)(4) and (6).
417 See Proposing Release, supra note 2, at 13033 (asking whether commenters think exchanges should be required to report the datasets directly to the Commission). Further, in its Proposal, the Commission noted that it considers the order routing data to be “regulatory” information and proposed to prohibit exchanges from accessing or using the information for commercial purposes. See id. at 13032. The Commission is adopting as proposed the prohibition on exchange personnel accessing the data for commercial purposes, as exchanges will have access to the information.
418 See id. at 13032. See also Rule 601T(d)(3)(iv) and (d)(2)(iv).
different exchanges. Because broker-dealer level data already is consolidated (i.e., the data would not separate out individual customer activity), adding another level of consolidation by grouping broker-dealers together would cloud insight into the potential conflicts of interest question, rendering the data potentially useless for the purpose of studying conflicts of interest. Accordingly, the Commission continues to believe that it needs access to the order routing data in its proposed form, without further aggregation of the data.

F. Implementation

The Commission proposed to publish a notice setting forth the start and end dates of the pre-Pilot, Pilot, and post-Pilot Periods. If applicable, the Commission also would publish a notice if it determines to suspend the one-year sunset of the Pilot Period. As discussed in the Proposing Release, 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. Thus, 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 commence at the conclusion of the Pilot and would end six months from the post-Pilot Period’s start date. The Commission proposed to publish the initial notice setting forth the start date for each of the Pilot’s three periods, and do so with a one-month minimum advance notice in order to allow the equities exchanges to finalize their preparations for the Pilot’s pre-Pilot Period, as well as provide at least a seven-month advance notice to market participants of the start date on which

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419 See, e.g., CFA Letter, at 5 (believing that “breaking the data out at the broker-dealer level will permit a clearer examination of how different broker-dealers may change their order routing behavior in response to changes in fees and rebates at each exchange.”); Lipson Letter, at 1; Spatt Letter, at 3; Better Markets Letter, at 7; Healthy Markets Letter I, at 24 fn. 87.

420 The Commission notes that the proposed language in Rule 610T(d)(1)(vi)(F), (d)(1)(xii)(H), and (d)(2)(vi)(F) has been modified slightly. As proposed, Rule 610T(d)(1)(vi)(F) and Rule 610T(d)(2)(vi)(F) both noted that the order size code at the largest share bucket was “>10,000.” As adopted, the largest share bucket order size code will be reflected as “>20,000 share bucket.” In addition, as proposed, Rule 610T(d)(1)(xii)(H) set forth a time frame of “>30 minutes of order receipt.” As adopted, that time frame will be clarified to state that the time frame is “>200 minutes of order receipt.”

421 See Proposing Release, supra note 2, at 13033.

422 See id.

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One commenter agreed that a one-month period between the Commission’s notice and the start of the pre-Pilot Period would be “sufficient provided there are no changes to the Pilot securities lists and assigned test/control groups.” Another commenter also agreed that the proposed seven-month period following the Pilot would be “sufficient to prepare for the Pilot.” However, this commenter requested that “any technical specification materials required to support implementation of the Pilot be reviewed with the industry and finalized in an expeditious manner, six months prior to the launch of the pre-Pilot data gathering phase,” which the commenter believed would “allow[ ] necessary time for industry firms to properly scope necessary development work and assign respective resources.” Another commenter, however, did not believe that a one-month period prior to the start of the pre-Pilot period would be sufficient for the industry to prepare and instead estimated that “the implementation of the pre-Pilot processing alone [would] take between three to four months.” As discussed and addressed above, a few commenters recommended that the Pilot begin with a limited phase-in period with a small number of securities.

After careful consideration of the comments received, the Commission continues to believe that the proposed implementation approach should provide adequate notice and time for those impacted by the Pilot to prepare for its requirements. The Pilot will begin with a six-month pre-Pilot period during which exchanges will not need to revise their fees to comply with the Pilot. At the conclusion of the pre-Pilot Period, exchanges will be required to revise any of their fees, which will apply to the Pilot Securities, that currently exceed the terms of the Pilot’s Test Groups. While the Exchange Act allows exchanges to file their fees for immediate effectiveness, exchanges may choose to preview their Pilot-related fee changes to their membership to provide them with additional time to adjust their order routing systems in response to those changes.

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423 See id. at 13033-34.


425 See id. at 8.

426 See FIF Letter, at 8.

427 See Choe Letter, at 1.

428 See supra notes 349-350 and accompanying text.

429 Although broker-dealers will need to account for different fee and rebate levels across two Test Groups and the Control Group if exchanges maintain different fee and rebate levels across the treatment groups, they will have three months before the start of the Pilot Period to update their execution algorithms, including to accommodate the prohibition on rebates and Linked Pricing in the rebate Test Group.

430 The fields in the Exchange Transaction Fee Summary that are calculated based on a look-back period to the prior month are: Rule 610T(e)(9) (month and year of the median figures); (12) average take/make; and (13) median take/make.

431 See Proposed Rule 610T(d).
No comments were received regarding the required notice to suspend the automatic sunset provision. Accordingly, the Commission adopts this aspect of the Pilot for the reasons outlined in the Proposing Release.

G. The Commission's Authority To Conduct the Pilot

The Commission is adopting the Pilot in furtherance of its statutory responsibilities. In 1975, Congress directed the Commission, through enactment of Section 11A of the Exchange Act, to use its authority under the Exchange Act to facilitate the establishment of a national market system to link together the multiple individual markets that trade securities. Congress intended the Commission to take advantage of opportunities created by new data processing and communications technologies to preserve and strengthen the securities markets. Congress also directed the Commission to exercise this authority “to carry out” certain “objectives,” which include assuring: “economically efficient execution of securities transactions”; “fair competition among brokers and dealers, among exchange markets, and between exchange markets and markets other than exchange markets”; the “availability... of information with respect to quotations for and transactions in securities”; and “an opportunity... for investors' orders to be executed without the participation of a dealer.”

In addition, the Exchange Act elsewhere requires that the rules of national securities exchanges (i) “provide for the equitable allocation of reasonable dues, fees, and other charges among its members and issuers and other persons using its facilities.” (ii) not be designed to “permit unfair discrimination between customers, issuers, brokers, or dealers,” and (iii) “impose any burden on competition not necessary or appropriate in furtherance of the purposes of [the Act].”

Through these provisions Congress conferred on the Commission “broad authority to oversee the SROs' ‘... operation ...’ of the national market system.” And it is pursuant to this authority that the Commission originally adopted Rule 610(c). The Pilot reflects the Commission’s efforts to evaluate, in light of changing market conditions, whether the existing transaction-based fee and rebate structure is conducive to further the statutory goals. In that sense, the Pilot follows as an appropriate progression from Rule 610, and it represents an important step in the Commission’s continuing obligation to implement Congress’s objectives for the national market system.

The Commission disagrees with the suggestion by one commenter that the Pilot is inconsistent with Exchange Act Section 19(b)(3)(A), which sets out part of the process by which proposed rule changes by self-regulatory organizations may become effective. Contrary to the commenter’s suggestion, nothing in Section 19 interferes with the Commission’s authority described elsewhere in the Exchange Act. Indeed, Section 19 itself makes clear that the Commission retains ultimate authority over the rules of registered exchanges, providing that “[n]o proposed rule change [by a self-regulatory organization] shall take effect unless approved by the Commission or otherwise permitted in accordance with [Section 19(b)].” And making clear that the Commission retains authority to suspend and institute proceedings to approve or disapprove even those exchange rules that are permitted to take effect upon filing with the Commission. Moreover, Section 19 explicitly permits the Commission to summarily implement or suspend any such proposed rule changes if, in the Commission’s view, doing so would serve the public interest, protect investors, or assist in maintaining fair and orderly markets. And it makes clear that the Commission retains authority to amend exchanges’ rules on its own initiative.

Commenters also disagreed about whether the Pilot complied with the Commission’s statutory obligations under the Administrative Procedure Act (“APA”) and whether the Pilot is consistent with the Exchange Act.

For example, working from the premise that the APA requires the Commission to “examine[ ] the relevant data and articulate[ ] a satisfactory explanation for its action including a rational connection between the facts found and the choices made,” one commenter believed that the Commission “lacks the administrative record,” “evidence” and “analysis” that would be “needed to justify such drastic government intrusion into free markets.” Another commenter, however, disputed that notion and observed that the Commission had developed the Pilot, in part, by relying on “published literature” that “is directly on point and speaks to the potential distortionary effects that the pilot program is designed to study” and that “certainly provides strong empirical support for further analysis by way of data generated through a pilot study.”

The responding commenter also found it significant that the Commission was “presently in the midst of a formal notice and comment process ... which was informed by years of discussion at, and a proposal from, the [EMSAC]” and that the Commission “had chosen to act via a pilot program rather than a proposal for a long-term rule.” The commenter therefore believed the

432 15 U.S.C. 78k-1(a)(1)(C), (a)(2); see also id. sec. 78k-1(c)(1) (stating that self-regulatory organizations shall not make use of the mails or any means or instrumentality of interstate commerce to collect, process, distribute, publish, or prepare for distribution or publication any information with respect to quotations to assist, participate in, or coordinate the distribution or publication of such information, or to effect any transaction in, or to induce or to influence the purchase or sale of, any such security in contravention of such rules and regulations as the Commission shall prescribe to "assure the ... fairness and usefulness of the form and content of such information").

433 15 U.S.C. 78b(f)(4), (b)(5), (b)(9). The Commission also has authority to adopt the Pilot pursuant to Exchange Act Sections 717(a)(4) and 78q(b)(9) requiring each exchange to make and keep "for prescribed periods such records, furnish such copies thereof, and disseminate such reports as the Commission, by rule, prescribes as necessary or appropriate in the public interest, for the protection of investors, or otherwise in furtherance of the purposes of the Act.


436 Id. Sec. 78b(d)(3).


438 The Commission disagrees with the suggestion by one commenter that the Pilot is inconsistent with Exchange Act Section 19(b)(3)(A), which sets out part of the process by which proposed rule changes by self-regulatory organizations may become effective. Contrary to the commenter’s suggestion, nothing in Section 19 interferes with the Commission’s authority described elsewhere in the Exchange Act. Indeed, Section 19 itself makes clear that the Commission retains ultimate authority over the rules of registered exchanges, providing that “[n]o proposed rule change [by a self-regulatory organization] shall take effect unless approved by the Commission or otherwise permitted in accordance with [Section 19(b)].” And making clear that the Commission retains authority to suspend and institute proceedings to approve or disapprove even those exchange rules that are permitted to take effect upon filing with the Commission. Moreover, Section 19 explicitly permits the Commission to summarily implement or suspend any such proposed rule changes if, in the Commission’s view, doing so would serve the public interest, protect investors, or assist in maintaining fair and orderly markets. And it makes clear that the Commission retains authority to amend exchanges’ rules on its own initiative.

439 Commenters also disagreed about whether the Pilot complied with the Commission’s statutory obligations under the Administrative Procedure Act (“APA”) and whether the Pilot is consistent with the Exchange Act.

440 For example, working from the premise that the APA requires the Commission to “examine[ ] the relevant data and articulate[ ] a satisfactory explanation for its action including a rational connection between the facts found and the choices made,” one commenter believed that the Commission “lacks the administrative record,” “evidence” and “analysis” that would be “needed to justify such drastic government intrusion into free markets.” Another commenter, however, disputed that notion and observed that the Commission had developed the Pilot, in part, by relying on “published literature” that “is directly on point and speaks to the potential distortionary effects that the pilot program is designed to study” and that “certainly provides strong empirical support for further analysis by way of data generated through a pilot study.”

441 The responding commenter also found it significant that the Commission was “presently in the midst of a formal notice and comment process ... which was informed by years of discussion at, and a proposal from, the [EMSAC]” and that the Commission “had chosen to act via a pilot program rather than a proposal for a long-term rule.”

442 See id. Sec. 78b(c).

443 5 U.S.C. 500, et seq.

444 A few commenters suggested that the Pilot would “not withstand judicial scrutiny” because certain aspects of the Pilot were “arbitrary and capricious and not in accordance with law.” See, e.g., Nasdaq Letter 1, at 3. Specifically, these commenters challenged the sufficiency of the Commission’s economic analysis, the exclusion of non-exchange trading centers from the Pilot, the inclusion of ETFs in the Pilot, the ability of the Pilot to provide the Commission with usable data, and the Commission’s decision to pursue a Pilot instead of other market structure initiatives. See, e.g., Nasdaq Letter 1, at 1-4, 9-11; Choe Letter 1, at 12; NYSE Letter, at 2-5. These specific concerns are addressed in Section IV (discussing the Commission’s economic analysis), Section I.A.4 (discussing the exclusion of non-exchange trading centers from the Pilot), Section I.B.3 (discussing the inclusion of ETFs in the Pilot), Section I.B.4 (discussing the ability of the Pilot to provide the Commission with usable data), notes 307-319 supra (discussing the Commission’s decision to pursue a Pilot in conjunction with other market structure initiatives).


446 See id. at 6.
Commission had fulfilled its statutory obligations in “determin[ing] that, given existing evidence suggesting the distortive effect of practices in the market tied to rebates or access fees, a pilot program will provide sufficient information to inform potential future rulemaking.”

The Commission agrees and notes that it has carefully examined available data on this issue, engaged in a lengthy and deliberative process, and taken into account the recommendations of two independent advisory bodies (EMSAc and the Investor Advisory Committee). The Commission developed the Pilot through a thorough review of the empirical literature, which was cited and discussed in the Proposing Release, as well as submitted as comments in response to this proposal. Moreover, as discussed in the Proposal, the EMSAC conducted a thorough process to consider, and ultimately formally recommend, that a pilot be conducted. The EMSAC reflected a broad and diverse set of perspectives. In addition, EMSAC heard testimony from experts during its open meetings (which included as panelists senior executives from exchanges) regarding exchange fee models, the appropriateness of a transaction fee pilot, and the shape that such a pilot should take. In addition to EMSAC, the independent Investor Advisory Committee also submitted a recommendation in support of the Pilot.

After considering all of the available information, the Commission has identified a fundamental disagreement among exchanges, market participants, academics, and industry experts regarding the impact of such fees and rebates on the markets. This disagreement is further exacerbated by the lack of data to evaluate these competing claims. The Commission believes that the Pilot is necessary to study the impact of exchange fees and rebates to determine whether a regulatory response is needed to mitigate the potential distortions that current exchange pricing models introduce to order routing behavior, market quality, and execution quality. Some commenters argued that the Pilot’s imposition of new fee caps constituted “impermissible government rate-making.” For example, one exchange commenter stated that “[government-imposed price controls] reduce choices” for market participants, “distort competition between over-the-counter venues and exchanges,” and are “costly to administer and lacking in an incentive to be efficient,” such that “they are only indicated where they overcome severe market imperfection such as monopoly ownership of a critical resource.” As discussed above, another commenter asserted that the Exchange Act “plainly contemplates that exchanges, rather than the SEC, will make an initial determination as to the price of a particular product or service,” and indicating that “fee setting is the province of each exchange, subject to the competitive forces that naturally control fees” and “subject to oversight only in particular situations.”

Commenters expanded on this argument by stating that the Commission had not sufficiently “evaluate[d] whether there is any evidence that the Commission’s objectives in adopting the cap on access fees . . . are not being met.” One commenter, for example, found it “concerning that the fee caps in the proposed Pilot do absolutely nothing to further the justification of the original cap and, unlike the original access fee cap, are set at levels that completely undercut existing rates.” Exchange commenters further contended that the Pilot imposes “completely new limitations on exchanges’ business” that were “unrelated to Regulation NMS’s Access Fee Cap,” because the Pilot would “not be a cap” but “an experiment” that exchanges may charge for execution not only against a protected quote, but for execution against any quote on an exchange, including depth-of-book and non-displayed orders, as well as “limit . . . the rebates that an exchange pays” and “pricing that is linked to providing or removing liquidity on an exchange.”

The Pilot has two Test Groups, one of which does not charge fees at all, but rather leaves in place the current Rule 610(c) fee cap and simply prohibits exchanges from paying rebates or offering Linked Pricing. The other Test Group does impose a lower fee cap for a small portion of NMS stocks (730 out of over 8,000 NMS stocks) for a limited period of time, but is doing so to study the effects of exchange fee-and-rebate pricing models and to gather data to assess the impact on the markets and market participants of a revised and lowered cap compared to the current cap. Further, the Commission selected an amount for that cap that was recommended by commenters, including the Investor Advisory Committee. As explained above, the existing fee cap was designed, in part, to prevent trading centers from charging unreasonably high fees to market participants required to honor their quotations by the Order Protection Rule. Because “[a]ccess fees tend to be highest when markets use them to fund substantial rebates to liquidity providers, rather than merely to compensate for agency services,” the Commission was concerned that “the published quotations of [outlier]
markets would not reliably indicate the true price that is actually available to investors or that would be realized by liquidity providers." The Commission explained that the fee cap helped assure the fairness and usefulness of quotation information; limit the extent to which the true price for those who access quotations can vary from the displayed price; permit broker-dealers to route orders in a manner consistent with the operation of a national market system; and protect limit orders and promote best-priced quotations. Accordingly, the Commission imposed a $0.0030 fee cap, which it believed reflected a competitive rate that was consistent with current business practices at the time (i.e., in 2005).

In establishing the Rule 610(c) fee cap, the Commission did not, however, consider the responsibility to ensure that markets continue to function in a fair, transparent, and efficient manner; nor did it state that the $0.0030 fee cap could not be revisited if market conditions changed. The Pilot is designed to determine, among other things, whether such a change has occurred. Despite assertions by one commenter that “powerful competitive forces are present that discourage exchanges from exercising unabated pricing power,” a $0.0030 fee is still consistently charged by many exchanges, raising concerns among other commenters that the fee cap is stuck at a non-competitive and, perhaps, an artificially high rate. Several commenters have also indicated that current pricing models have resulted in the kind of distortive pricing that Rule 610(c) was designed to prevent.

Testing lower fee levels, and a no-rebate fee regime, will help the Commission to determine whether further regulatory action is needed to achieve the objectives of Rule 610(c) as well as the Commission’s statutory mandate to oversee the equities markets.

The Commission’s position is echoed by other commenters that found the “suggest[ion] that the Commission lacks the authority to implement the Pilot, or that testing a rebate ban or alternative access fee caps would constitute an impermissible form of price control . . . meritless” or “entirely inaccurate.” One commenter, for example, noted that the Exchange Act “provides very broad authority for the Commission to regulate all aspects of exchange operation, including fee schedules . . . .” This commenter further observed that “it makes no sense to attack the Commission’s proposal as an impermissible form of ‘rate setting’ when the markets have been operating with exchange fee limits for more than 10 years.” Moreover, this commenter asserted that “exchange criticisms regarding ‘price control[s]’ are ‘contradicted by their acceptance of the[s] existing price regulation’ in Rule 610(c), which ‘may better serve their interests than the alternative caps and rebate prohibition included in the Pilot.”

This commenter asserted that the Commission “cannot simply skip this analysis or assume it has unrestricted authority to conduct pilots on the basis that the Proposal is intended to be temporary.”

The Commission notes that it followed its standard practice in the Proposing Release to implement the statutory authority under which it promulgated its Proposal. The Commission has complied with its statutory obligations in promulgating the Pilot and has clear statutory authority to adopt the Pilot, which the Commission believes furthers the purposes of the Exchange Act.

III. Paperwork Reduction Act

Certain provisions that the Commission is adopting today contain “collection of information requirements” within the meaning of the Paperwork Reduction Act of 1995 (“PRA”). The Commission published their business models, but challenge the Commission’s authority to implement what they describe as price controls when their own business models are negatively impacted.”); Larry Harris Letter, at 6 (noting that “exchange holding companies have a strong interest in maintaining the current system” and that the SEC “may reasonably consider these interests when evaluating comments submitted by the exchanges); Themis Trading Letter II, at 3 (stating that the Commission should not be “distracted . . . by conflicted stock exchanges desperately fearful that their business models might come crashing down!”).

471 See, e.g., Cboe Letter I, at 9.

472 NYSE Letter I, at 12.

473 Id. See also Cboe Letter I, at 11. For example, the commenter noted that the Commission had “provided no analysis or discussion demonstrating its reasoned decision-making of how the specific fee structures to be mandated in the Proposal would be equitably allocated or comparable” under Section 6 of the Exchange Act. NYSE Letter I, at 12. See also 15 U.S.C. 78f(b)(4) (requiring the rules of an exchange to “provide for the equitable allocation of reasonable dues, fees, and other charges among its members and insurers and other persons using its facilities”).

474 If any of the provisions of these amendments, or the application thereof to any person or circumstance, is held to be invalid, such invalidity shall not affect other provisions or application of such provisions to other persons or circumstances that can be given effect without the invalid provision or application.

475 44 U.S.C. 3501 et seq.
a notice requesting comment on the collection of information requirements in the Proposing Release and submitted relevant information to the Office of Management and Budget ("OMB") for review in accordance with the PRA and its implementing regulations. The title of the new collection of information for Rule 610T is "Transaction Fee Pilot Data." Compliance with these collections of information requirements is mandatory. 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. We have applied for an OMB Control Number for this collection of information.

The Commission requested comment on the collection of information requirements in the Proposing Release. The Commission received two comment letters on the estimates for the collection of information requirements included in the Proposing Release, which are discussed below.

A. Summary of Collection of Information

The Pilot requires the equities exchanges to prepare four sets of data, which constitute a collection of information, within the meaning of the PRA. First, pursuant to Rule 610T(b), the primary listing exchanges will be required to prepare and publicly post two sets of data on the Pilot Securities listed on their markets—the Pilot Securities Exchange Lists and the Pilot Securities Change Lists. In addition, pursuant to Rule 610T(d), all equities exchanges will be required to prepare and publicly post the Exchange Transaction Fee Summaries, which are monthly summaries of information concerning fees assessed and rebates paid to market participants transacting on the exchange.

B. Proposed Use of Information

The data collected during the Pilot, including the Pilot Securities Exchange Lists, Pilot Securities Change Lists, Exchange Transaction Fee Summaries, and order routing datasets, will allow researchers and market participants to have ready access to information that will facilitate the study of the impact of an exogenous shock to transaction fees and rebates on order routing behavior, execution quality, and market quality. In turn, this information should facilitate a data-driven evaluation of future policy choices.

In addition, 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, researchers, 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 Test Groups during the Pilot.

C. Respondents

The respondents to this collection of information will 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, will apply to the six primary listing exchanges for NMS stocks. Rule 610T(d), which requires datasets on order routing, will 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, will apply to all thirteen equities exchanges currently registered with the Commission.

D. Total Initial and Annual Reporting and Recordkeeping Burdens

The burdens associated with the Pilot are described fully below, but the below table briefly summarizes the relevant burdens set forth in the Proposing Release and in this release.

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<thead>
<tr>
<th>Category</th>
<th>Proposing Release</th>
<th>Adopting Release</th>
<th>Annual burdens (hours/exchange)</th>
<th>One-time burdens (hours/exchange)</th>
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<td>Pilot Securities Change Lists</td>
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1. Pilot Securities Exchange Lists and Pilot Securities Change Lists

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 Rule 610T(b)(2)(i) on their websites in pipe-delimited ASCII format. The Commission preliminarily estimated 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 its initial Pilot Securities Exchange List. One commentator stated that it "anticipates it could take as many as 44 hours" to compile the initial Pilot Securities Exchange List. The commenter stated that its estimates of the costs associated with the Pilot are based on its "prior experience implementing the Tick Size Pilot, and other similar initiatives." In light of this comment, the Commission is increasing its estimate. While, unlike for the Tick Size Pilot, the Commission will prepare the Initial List of Pilot Securities and assign them to their

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476 See supra note 2, at 13038-39.
477 44 U.S.C. 3507; 5 CFR 1320.11.
478 See supra Section II.E.0.
479 See Proposing Release, supra note 2, at 13038-39.
480 See supra Section I.E.3.
481 See supra Section I.E.0.
482 See Proposing Release, supra note 2, at 13038.
483 See supra note 2, at 13038.
484 See supra Section II.E.0.
485 See supra Note 2, at 13038.
486 See supra Section II.E.3.
and therefore the exchanges will only need to separate out their listed securities into a separate list, the Commission nevertheless will increase its estimate as the commenter suggested. Accordingly, the Commission estimates that each primary listing exchange would incur, on average, a one-time burden of approximately 44 burden hours per primary listing exchange to compile and publicly post their initial Pilot Securities Exchange List.485 Accordingly, the Commission believes that the aggregate one-time burden associated with the initial Pilot Securities Exchange Lists would be 264 burden hours.486

After posting its initial Pilot Securities Exchange List, each equities exchange will be required to keep current that list to reflect any changes, and to change or update 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 estimated 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 its market.487 The Commission also preliminarily estimated that, once the primary listing exchanges have established these systems, on average, each primary listing exchange would incur 0.5 burden hours daily, or 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 its website prior to the start of each trading day.488 One exchange commenter stated that “the Commission predicts it would take only 12.5 hours to develop and maintain systems to comply” with the requirements to update prior to the start of each trading day the Pilot Securities Exchange Lists and Pilot Securities Change Lists.489 Based on “its prior experience implementing the Tick Size Pilot, and other similar initiatives,” this commenter further stated that it believed “it could take as many as 300.5 hours to develop and maintain those systems.”490 While the commenter did not elaborate on how it computed its estimate or whether it represents an aggregate burden estimate or an annualized estimate, the commenter appears to have misunderstood the burden estimates contained in the Proposing Release because the Commission’s estimate greatly exceeded 12.5 hours. Specifically, the Commission’s preliminary estimates included only an estimated burden of 8 hours for primary listing exchanges to compile and publicly post the initial Pilot Securities Exchange List, a one-time burden of 12 hours for primary listing exchanges to develop appropriate systems to track and compile changes to Pilot Securities, and an ongoing burden of 126 hours annually to compile any such changes and publicly post the updated Pilot Securities Exchange Lists and Pilot Securities Change Lists. For an aggregate burden estimate of 335 hours per exchange for the entire Pilot.491 Assuming that the commenter’s estimate of 300.5 hours is meant to be an aggregate burden estimate, the Commission notes that its revised aggregate burden estimate of 371 hours exceeds the commenter’s estimate. The Commission’s estimates are averages that take into account the diverse set of six primary listing exchanges and the associated burdens that they would collectively experience as a result of the Pilot. Moreover, the Commission expects that the primary listing exchanges will be able to leverage their experience and resources from the recent Tick Size Pilot to meet the requirements of the Pilot. As noted above, unlike for the Tick Size Pilot, the Commission will set the initial List of Pilot Securities and the primary listing exchanges only need to keep those lists up to date if their listed issuers experience any relevant change. Accordingly, the burdens on the primary listing exchanges with respect to the lists of Pilot Securities should be less than those incurred during the Tick Size Pilot.492

For those reasons, the Commission continues to believe its estimate of the aggregate one-time burden for primary listing exchanges to develop appropriate systems to track and compile changes relevant to Pilot Securities listed on their markets will be approximately 12 burden hours for each primary listing exchange, or 72 total burden hours, and the average, aggregate annual burden to update and publicly post the lists of Pilot Securities will be approximately 126 burdens hours for each primary listing exchange, or 786 total burden hours for all 6 exchanges.493

2. Exchange Transaction Fee Summaries

The Commission is requiring 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 believes that all the data necessary to complete the summary are currently maintained by the equities exchanges. However, the equities exchanges will be required to compute the monthly realized average and median per share fees and rebates, each by participant type, that qualified for the Base and Top Tier fees and rebates, using fee and volume information that the equities exchanges maintain.

The Commission preliminarily estimated that each equities exchange would incur a one-time burden of approximately 80 burden hours of internal legal, compliance, information technology, 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.494

One commenter objected generally to the Commission’s burden estimates, but

485 The Commission continues to believe that this will require the services a full-time Compliance Manager and Programmer Analyst. The Commission estimates that each Compliance Manager and Programmer Analyst will each spend approximately 22 hours, for a combined total of approximately 44 hours, to compile and publicly post to an exchange’s website a downloadable file containing the initial Pilot Securities Exchange List.496

486 44 burden hours per primary listing exchange x 6 primary listing exchanges = 264 burden hours.

487 The Commission derived the total estimated burden of 44 burden hours by the following estimating equations: (Attorney at 4 hours) + (Compliance Manager at 4 hours) + (Programmer Analyst at 4 hours) = 12 burden hours. See Proposing Release, supra note 2, at 13035.

489 The Commission based 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)). See id.

490 Id. See also Choe Letter I, at 15, supra note 2, at 13037.

491 See Proposing Release, supra note 2, at 13036. The Commission notes that it has revised its aggregate burden estimate upwards to 371 hours for each exchange to address commenter concerns that the estimated burden associated with compiling and publicly posting the initial Pilot Securities Exchange List was too low.

492 See Proposing Release, supra note 2, at 13027 n.153 and accompanying text; note 740 infra.

493 126 burden hours per primary listing exchange x 6 primary listing exchanges = 756 burden hours.

494 See Proposing Release, supra note 2, at 13037. The Commission preliminarily estimated 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 estimated 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 id. at 13037 n.194.
did not provide its own estimates of specific burden hours or costs.\footnote{Choo Letter I, at 21 (stating that the "implementation and ongoing costs of the Pilot will be significantly larger in terms of burden hours and expenditures than the Commission estimates," but providing no specific analysis or alternative estimates). But cf. Better Markets Letter, at 2 ("All of the data-fields are thoughtfully proposed, and the cost of producing them is minimal and certainly acceptable given the enormity of the benefits."). The commenter did not provide specific burden hour or cost estimates.} The Commission continues to estimate that each equities exchange will incur a one-time burden of approximately 40 burden hours per year, approximately half the estimated burden to develop appropriate systems, to monitor and, if necessary, update its systems used for compiling, formatting and publicly posting the Exchange Transaction Fee Summaries.\footnote{See Proposing Release, supra note 2, at 13037. (Attorney at 20 hours) + (Compliance Manager at 10 hours) + (Programmer Analyst at 20 hours) = 60 burden hours per equities exchange.} The Commission also preliminarily estimated that, on average, an equities exchange would incur an ongoing burden of approximately 40 burden hours per year, approximately half the estimated burden to develop appropriate systems, to monitor and, if necessary, update its systems used for compiling, formatting and publicly posting the Exchange Transaction Fee Summaries. One commenter objected generally to the Commission’s burden estimates, but did not specifically explain whether or how this burden estimate was incorrect. The Commission continues to estimate that the annual ongoing burdens associated with monitoring and, if necessary, updating these systems would be approximately half the burdens of initially developing the systems. Accordingly, the Commission continues to estimate that an equities exchange will 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.\footnote{See note 495 supra.}

The Commission continues to estimate 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.\footnote{See id. at id. at fn. 199 and accompanying text.} In addition, each equities exchange will be required to make its summary publicly available on its website using an XML schema to be published on the Commission’s website. As the Commission preliminarily believed that the equities exchanges had experience applying the XML format to market data,\footnote{See Proposing Release, supra note 2, at 13037. The Commission derived the total estimated burden from the following estimates: (Compliance Manager at 1 hour) + (Programmer Analyst at 1 hour) + (Senior Business Analyst at 2 hours) = 3 burden hours per equities exchange. See id. at 13037 n.106.} the Commission estimated that initially each equities exchange would incur a burden of 2 burden hours specific to the initial Exchange Transaction Fee Summary to ensure that it has properly implemented the XML schema.\footnote{See id. at 13037 n.198 and accompanying text.} One commenter objected generally to the Commission’s burden estimates, but did not specifically explain whether or how this burden estimate was incorrect.\footnote{See id. at 13037 n.199 and accompanying text.} The Commission continues to estimate that each equities exchange will require approximately 4 burden hours to complete the initial Exchange Transaction Fee Summary,\footnote{See id. at 13037 n.203.} for an aggregate, initial burden of 52 hours to complete its initial Exchange Transaction Fee Summary.\footnote{See id. at fn. 195 supra.} The Commission also continues to estimate that each equities exchange will incur an initial burden of approximately 2 burden hours for an aggregate, initial burden of 26 hours to post that dataset publicly on its website using an XML schema to be published on the Commission’s website. The total aggregate, initial burden to complete the initial Exchange Transaction Fee Summary will therefore be 78 burden hours.\footnote{See Proposing Release, supra note 2, at 13037.}

Each equities exchange will 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 fee and rebate information. The Commission preliminarily believed that such updates would require fewer burden hours than the initial Exchange Transaction Fee Summary, as the equities exchanges would have experience calculating necessary data and formatting the reports as required by the Rule.\footnote{See Proposing Release, supra note 2, at 13037.} Accordingly, the Commission preliminarily estimated that it would require approximately 2 burden hours each month, or 24 burden hours on an annualized basis, for each equities exchange to update the Exchange Transaction Fee Summary.\footnote{See id.} This estimate contemplated the impact of publicly posting the summary using the XML schema to be published on the Commission’s website. One commenter objected generally to the Commission’s burden estimates, but did not specifically explain whether or how this burden estimate was incorrect.\footnote{See id.} The Commission continues to estimate that it will require approximately 2 burden hours each month, or 24 burden hours on an annualized basis, for each equities exchange to update the Exchange Transaction Fee Summary.\footnote{See id.} As such, the equities exchanges will incur an aggregate, annual burden of 312 burden hours to update and publicly post on

\footnote{note 495
\footnote{4 burden hours per equities exchange x 13 equities exchanges = 52 burden hours.}
\footnote{2 burden hours per equities exchange x 13 equities exchanges = 26 burden hours.}
\footnote{See Proposing Release, supra note 2, at 13037.}
\footnote{See id. 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. See id. at 13037 n.203.}
\footnote{See note 495 supra.}
\footnote{See Proposing Release, supra note 2, at 13037. (Attorney at 10 hours) + (Compliance Manager at 10 hours) + (Programmer Analyst at 11 hours) + (Senior Business Analyst at 10.5 hours) = 50 burden hours.}
\footnote{See note 495 supra.}
their websites the Exchange Transaction Fee Summaries.151

3. Order Routing Datasets

The Commission preliminarily estimated that, on average, there would be no paperwork burden to the equities exchanges to capture the order routing data required pursuant to Rule 610T(d) to be included in the order routing datasets, as the Commission expected that the equities exchanges would collect the required data to create the order routing datasets by leveraging existing systems and technology already in place for the collection and reporting of data.154 The Commission believes this continues to be true with the changes to the order routing datasets, which also involve data elements currently captured by existing systems.

The Commission preliminarily believed, however, that the equities exchanges would incur an initial one-time burden of 80 burden hours per equities exchange to ensure that their systems and technology are able to accommodate the proposed requirements to aggregate, anonymize, and publicly post the order routing information.155 While the exchanges will still need to aggregate the data, they no longer will need to anonymize and publicly post it and instead will transmit the information to the Commission. The Commission continues to believe that each equities exchange would incur an initial one-time burden of 80 burden hours to ensure that its systems and technology are able to accommodate the proposed requirements to aggregate and provide to the Commission the order routing information. Accordingly, the Commission estimates that the aggregate one-time burden for ensuring an exchange’s systems and technology are able to aggregate and provide to the Commission the required order routing data in compliance with Rule 610T(d) will be 1,040 burden hours.156

The Commission also preliminarily estimated that, on 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 Rule.157 The Commission continues to estimate that, on 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 Rule. Therefore, the Commission estimates that the aggregate annual burden to maintain the systems necessary to aggregate and provide to the Commission the required order routing information is approximately 520 burden hours per year.158

Each equities exchange would incur an ongoing burden associated with creating and formatting the order routing datasets each month. The Commission noted that the equities exchanges have experience with creating similar datasets in accordance with their obligations under Rule 605 of Regulation NMS.159 The Commission preliminarily believed that each equities exchange would incur burdens similar to those associated with preparing Rule 605 reports.520 Accordingly, the Commission initially believed 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.521 While the order routing datasets will not be publicly posted but will instead be provided to the Commission, the Commission is requiring the equities exchanges to separate out post-only orders and orders that exclude auction-only orders if they so choose. The Commission estimates that separating out these orders will require approximately 1 additional burden hour per month. As such, the Commission estimates that each equities exchange will incur a burden of approximately seven burden hours per month, or 84 burden hours per year, to prepare and provide to the Commission the order routing datasets. Therefore, the aggregate, annual burden to prepare and provide to the Commission order routing datasets in accordance with Rule 610T(d) will be approximately 1,092 burden hours.522

One exchange commenter stated that “the Commission allocates 160 hours associated with producing order routing data,” but estimated that it “would actually require over 400 hours,” based on “its prior experience implementing the Tick Size Pilot, and other similar initiatives . . . . “523 While the commenter did not elaborate on how it computed its estimate or whether it represents an aggregate burden estimate or an annualized estimate, the commenter appears to have misunderstood the burden estimates contained in the Proposing Release because the Commission’s estimate exceeds the 160 hours cited by the commenter. Specifically, the Commission’s preliminary estimate included a one-time burden of 80 hours and an ongoing burden of 112 hours annually,524 for an aggregate burden estimate of 416 hours per exchange for the entire Pilot.525 Second, the commenter does not explain how it calculated its estimate of “over 400 hours,” break down the costs included in this estimate, or specify whether this number is an aggregate burden estimate or an annualized estimate. Assuming that the commenter’s estimate of over 400 hours is meant to be an aggregate burden estimate, the Commission notes that its revised aggregate burden estimate of 452 hours is substantially similar. The Commission notes that exchanges will no longer be required to publicly post this data, but will instead transmit the datasets directly to the Commission. Moreover, the Commission expects that the exchanges will be able to leverage their experience and

517 See Proposing Release, supra note 2, at 13038. The Commission derived the total estimated burdens from the following estimates, which reflected the Commission’s preliminary view that annual ongoing burdens would be approximately half the burdens of initially ensuring an exchange 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. See id. at 13038 n.209.

518 40 burden hours per equities exchange x 13 equities exchanges = 520 burden hours.

519 See Proposing Release, supra note 2, at 13038.

520 See id. The Commission preliminarily estimated that each 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 estimated 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 id. at 13038 n.207.

521 80 burden hours per equities exchange x 13 equities exchanges = 1,040 burden hours.

522 84 burden hours per year x 13 equities exchanges = 1,092 burden hours per year.

523 NYSE Letter I, at 15. See also Choe Letter I, at 21 (stating that the “implementation and ongoing costs of the Pilot will be significantly larger in terms of burden hours and expenditures than the Commission estimates,” but providing no specific analysis or alternative estimates).

524 The Commission notes that it has revised this estimate upwards to 124 burden hours annually.

525 See Proposing Release, supra note 2, at 13038. The Commission notes that it has revised this estimate upwards to 452 burden hours per exchange for the entire Pilot.
resources from the Tick Size Pilot to meet the requirements of the Pilot.526 For these reasons, the Commission believes its estimate of the one-time burden for exchanges to develop and implement appropriate systems to aggregate the order routing data will be, on average, 80 burden hours for each exchange, and the ongoing annual burden to update these systems and to gather and to transmit the relevant data to the Commission will be, on average, 124 burden hours for each exchange.

E. Collection of Information Is Mandatory

All of the collections of information pursuant to Rule 610T would be mandatory.

F. Confidentiality of Responses to Collection of Information

The Commission believes that the broker-dealer specific order routing data should be protected from disclosure subject to the provisions of applicable law.527 The Commission will deem broker-dealer identifying order routing data as being subject to a confidential treatment request under 17 CFR 200.83 without the need to submit a request. The Pilot Securities Exchange List, Pilot Securities Change List, and the Exchange Transaction Fee Summary would not be confidential. Rather, each would be publicly posted by the exchanges.

G. Retention Period for Recordkeeping Requirements

National securities exchanges would be required to retain records and information pursuant to 17 CFR 240.17a-1 (Rule 17a-1 under the Exchange Act).528

IV. Economic Analysis

As discussed above, the Pilot is designed to produce information on the impact of transaction fee-and-rebate pricing models on order routing decisions by broker-dealers, as well as their impact on execution and market quality.529 In recent years, a number of academics and market participants have expressed concern that the structure of exchange transaction-based fee pricing may lead, for example, to potential conflicts of interest between broker-dealers and their customers when brokers-dealers route customer orders to trading centers offering rebates so that the broker-dealer can capture the rebates, even when these venues do not offer high execution quality.530 However, as discussed in more detail below, the Commission cannot determine from existing empirical evidence the impact, if any, of exchange transaction fee models on order routing decisions by broker-dealers or on market and execution quality.531 Specifically, determining whether a causal relationship between exchanges’ transaction fee-and-rebate pricing models and broker-dealers’ behavior is complicated because, for example, such pricing models may influence 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 whether such conflicts may exist and any potential negative impacts may manifest.532


526 See Section C.2.a.ii. infra. See also, e.g., Better Markets Letter, at 2.
528 17 CFR 240.17a-1.
531 For commenters contrasting with this assessment, see, e.g., Barnard Letter, at 1 (stating the Pilot “should provide credible analyses of the effects—both positive and negative—of exchange fees and rebates and their efficiency of trading.”); Better Markets Letter at 2 (stating that the Commission “lacks sufficient data to outlaw rebates” and believed that the Pilot “should fill this data and knowledge gap.”)
532 Many commenters expressed support for the Pilot and the utility of the information that may be gained from it. See AJO Letter, at 1, CII Letter, at 3, NYSE Letter, at 1–2, MFS Letter, at 1, Nuveen Letter, at 2, Clark-Joseph Letter, at 1, RBC Letter I, at 2, Invesco Letter, at 2, CFA
533 Because of the existing lack of empirical evidence regarding the potential conflicts of interest and potential effects of exchange fee models, additional information would assist the Commission in making future regulatory decisions. To remedy the insufficiency of existing empirical evidence, the Commission is adopting the Pilot to generate data that is otherwise unavailable to study fees and rebates that exchanges assess to broker-dealers and observe the impacts of those fees and rebates on the markets and market participants. Specifically, the Commission expects that the data collected is 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, and the extent to which exchange pricing models create distortions that may have adverse impacts. The data obtained from the Pilot will inform future regulatory initiatives to the ultimate benefit of investors.534 In addition, the Pilot will provide information about other potential economic effects of reducing access fee caps or prohibiting rebates and Linked Pricing. For example, the Pilot could offer information on whether prohibiting rebates and Linked Pricing alters broker-dealer behavior in a manner that affects market quality, such as by impacting quoted spreads across NMS stocks.535
534 The Pilot is uniquely capable of generating empirical evidence that is currently lacking because it is designed to provide an exogenous shock to transaction fee-and-rebate pricing models across all exchanges simultaneously and facilitate the collection of representative data across a broad range of securities.536 An exogenous shock to a system occurs when an element of the system is changed from within the system. (i.e., the change or shock is not under the control or influence of those within the system) but can induce endogenous (i.e., within the system) responses. In the Pilot’s context, the exogenous shock...
tackles the form of a reduction of the mean permissible transaction fees and a prohibition on rebates and Linked Pricing on all U.S. equities exchanges. This shock will allow researchers to explore how changes to fees and rebates could lead to changes in broker-dealer order routing and market and execution quality for a broad sample of NMS securities. Specifically, the reduction in fees or the elimination of rebates and Linked Pricing, as required in specific Test Groups of the Pilot, may reduce the magnitude or eliminate the potential conflict of interest between broker-dealers and their clients and the potential distortions introduced by exchange transaction-based fees and rebates. These effects would, in turn, be reflected in measurable changes to the order routing and execution quality of stocks in the Pilot’s Test Groups.

The terms of the Pilot are discussed in Section II above. Exchanges will continue to be permitted to have varying fees within each Test Group, and will be permitted to change their fees at their discretion, subject to the proposed rule change filing requirements of Section 19 of the Exchange Act, during the Pilot for securities within each Test Group, so long as they comply with the conditions applicable to that Test Group.

In the absence of the Pilot, the Commission 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 analyze the effects of changes to fees and rebates. By imposing the same modifications to fees and rebates on all U.S. equities exchanges, the Pilot will allow researchers to obtain data that will permit them to examine the impact of changes to fees and rebates on the order routing decisions of broker-dealers. If all exchanges were not subject to the pilot terms, the pilot data would be limited because broker-dealers could redirect their order flow to the non-participating exchanges. Accordingly, the Commission believes that the Pilot will enable the collection of valuable data that would otherwise be unavailable.

The Commission is mindful of the costs imposed by, and the benefits obtained from, the rules it promulgates. 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. 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.

A few commenters challenged the sufficiency of the economic analysis contained in the Proposal. For example, one commenter argued the proposal was “arbitrary and capricious” because the Commission failed to consider the economic consequences of its proposal and only partially framed the costs and benefits of the Proposal, ignoring important and significant factors and costs. Similarly, another commenter believed that the “cost-benefit analysis contain[ed] numerous flaws that are inconsistent with the Commission’s obligation to provide a ‘reasoned basis’ for its regulations,” namely that the Commission had “substantially underestimated the costs of the Proposal” and “fail[ed] to identify any countervailing market benefit that justifies imposing . . . harms on . . . exchanges and issuers.” Another commenter thought the Commission understated the potential costs of the Pilot while overstating the benefits. For example, some commenters noted that they anticipated the Pilot would result in wider spreads, increased transaction costs, and increased broker commissions, all of which would result in added costs to investors. Several commenters thought the Commission failed to consider or underestimated the implementation costs of the Pilot, while other commenters challenged these assertions and instead believed the Pilot would impose minimal costs on exchanges and broker-dealers, particularly in light of the existing processes and technology that currently support immediately effective fee changes from the exchanges. Finally, other commenters felt that the economic analysis failed to adequately account for the projected costs to particular categories of market participant.

Other commenters supported the Commission’s analysis. For example, one commenter argued that “differing estimates of costs is not a sufficient basis alone to challenge Commission action.” This commenter argued that the commenters “tend to ignore the benefit side of cost-benefit analysis” and believed that “the most significant benefit of the pilot is its potential to inform subsequent rulemaking,” such that the “mere presence of uncertainty in the Commission’s estimates of potential costs and benefits does not by itself open the pilot program to challenge.” While acknowledging the potential for “liquidity effects,” this commenter further noted that the Commission “is merely held to make a reasonable estimate of those costs before adopting a pilot program,” not to “make a perfect estimate” or “cease the pilot if the costs to liquidity prove significant.”

The economic analysis provided in the Proposing Release thoroughly described the potential economic effects of the Transaction Fee Pilot, including the benefits, costs, and alternatives and...
the potential effect on efficiency, competition, and capital formation.

Like the Proposing Release, where possible, the Commission has quantified below the likely economic effects of the 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 makes it difficult to predict how market participants would act under the conditions of the 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 the Pilot, such as volume discounts, the Commission cannot quantify, ahead of the Pilot, the economic impact of any changes in order routing decisions by broker-dealers that may result from the 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.

A. Background and Market Failures

The Commission’s Proposal provided a review of transaction-based fee models, including a discussion of the history and mechanics of transaction-based pricing and an overview of the concerns about potential conflicts of interest between broker-dealers and their customers attributed to fees and rebates assessed by exchanges as well as the potential distortions that exchange fee models can introduce into market structure.551

The Commission considered whether competition within the broker-dealer industry, as well as competition among the equities exchanges, is sufficient to alleviate potential conflicts of interest that may arise from broker-dealers’ conflicts of interest with their customers or exchanges. The Commission believes that competition between broker-dealers may not be capable of addressing these potential conflicts and distortions for three reasons: asymmetric information, switching costs, and a lack of collective action, each of which is discussed below. Further, competition between broker-dealers is not readily capable of independently resolving the other potential concerns presented by the exchange fee models, such as excessive

intermediation, fragmentation, complexity, and cross-subsidization because those issues are within the exclusive control of the exchanges. The limitations of competition among the equities exchanges is discussed in detail below.

1. Market Failure at the Broker-Dealer Level

The Commission considered whether competition could alleviate potential conflicts of interest between investors and broker-dealers, as investors choose broker-dealers to place orders on their behalf.552 To the extent that investors are able to identify broker-dealers that do not act on potential conflicts of interest in a manner inconsistent with the interests of their customers, investors could discourage broker-dealers from acting on such conflicts of interest and avoid doing business with those broker-dealers that do not offer such assurances. However, several commenters opined that competition and deference to market forces alone would not be sufficient to challenge the “deeply rooted conflicts of interest” that they believe are present in today’s market structure.553 For example, one commenter noted that many institutional clients are tied to large broker/dealers because of the multitude of services that their brokers provide, so they cannot simply “fire their brokers” if they are unhappy with their routing decisions.554 Further, the Commission does not believe that competition among broker-dealers alone will be sufficient to address potential conflicts of interest in order routing decisions because of three conditions that are present in today’s markets: 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.555 For example, customers do not generally have access to information about brokers’ individual sources of revenue.556 As discussed below in more detail, although disclosures 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 fee-and-rebate pricing models on order routing decisions. Moreover, while under Rule 606, a customer may request certain information about how her broker routed certain orders on her behalf, a customer would not necessarily use this information to compare how these orders would have been treated by broker-dealers other than her own. Further while recent amendments to Rule 606 would provide customers with limited information about transaction fees paid and transaction rebates received by the broker, the disclosure would not provide data to enable the customer to assess the impact of exchange transaction fees and rebates on market quality and execution quality.

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.557 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.558 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. The collective action problem arises because, although each customer individually bears a cost to switch accounts, the benefits of a successful threat are available to all customers whether they would switch or not. If the

552 See Section infra IV.B.2.a.
553 See, e.g., Better Market Letter at 1 (stating “[p]ayments by the exchanges that incentivize and induce routing decisions by broker-dealers at the expense of best execution and market quality is one of the most entrenched and insidious market practices today, and requires forceful and independent intervention by the SEC.”). See also Themis Trading Letter at 4–5; Larry Harris Letter at 9; Clearpool at 2.
554 See Themis Trading Letter I at 5.
555 See Larry Harris Letter, at 3 (noting that most brokerage customers do not know about potential broker age conflict systems and so do not know that their brokers may not be representing their orders as best as they might).

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

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

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

2. Market Failure at the Exchange Level

Several commenters considered whether existing market forces, including competition among the equities exchanges, are sufficient to address the potential distortions caused by exchange pricing models. Some commenters felt that "some regulatory solution," like the Pilot, "may be necessary to force market participants, particularly exchanges, to change the manner in which they conduct business" because competitive pressures on exchanges may serve as a barrier to market-led reforms in this area. Further, one commenter noted that "market forces cause the exchanges to charge taker and maker fees to the detriment of the public interest" and therefore regulatory action is necessary to address market distortions caused by the maker-taker and maker-taker fee models.

Further, the Commission notes that one market conducted a limited unilateral access fee experiment in 2015 to test the impact of reductions to its fees and rebates on 14 securities traded on its market. Several commenters noted the limited utility of that study given its narrow scope and applicability to one market. The fact that no other exchange joined in the 2015 access fee experiment, or independently undertook a similar study thereafter, supports the view that it is unlikely that competition among the exchanges alone would compel the exchanges to study, let alone address, potential distortions that may result from their fee and rebate models.

B. Baseline

We compare the economic effects of the 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 ETFs), the Pilot is designed to produce information on order routing behavior that would not otherwise be available. The baseline, therefore, includes the existing information available to the Commission in the absence of a Pilot, which the Commission could use to inform future regulatory action.

The baseline also sets out the exchanges' current practices with respect to fees and rebates and the regulations governing those fees and rebates.

1. Current Information Baseline

While the theoretical studies referenced in the Proposing Release suggest that transaction-based fee models create potential issues for investors, limited empirical evidence exists to date about the extent to which potential conflicts of interest arise from maker-taker and maker-taker pricing models and how exchange transaction-based fees and rebates impact market integrity and structure of the U.S. equity markets. Consequently, the relation between transaction-based pricing and conflicts of interest is not well understood. Additionally, commenters are divided as to how to interpret existing knowledge. One Commenter stated that we had "much to learn" while other commenters felt that there was sufficient existing knowledge to move directly to rule making without a Pilot.

Below, we discuss the existing information currently available to the Commission or the public that concerns the relationship between transaction-based fee-and-rebate pricing models and order routing decisions and we describe the limitations of this information for use in policy discussions regarding transaction-based fees and rebates and the potential conflicts of interest and potential distortions that may accompany them. We then discuss the potential to produce additional information regarding the impact of exchange fees and rebates absent the Pilot.

While a number of studies attempt to document the relation between transaction-based fees, order routing decisions, and execution quality, these 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. This section details these limitations.

a. Limitations of Existing Studies

Multiple commenters submitted empirical evidence that they argued was consistent with conflicts of interest. For example, one Commenter cited evidence that trade execution algorithms, even when not fee sensitive, tend to have lower execution quality than algorithms that are not fee sensitive. Another Commenter cited existing academic, industry, and government sources suggesting the existence of conflicts of interest, or of the investing public's perception that there exist conflicts of interest. Another commenter suggested evidence existed that routing decisions were not always in the best interest of investors by arguing that adverse selection differs by exchange, and that this difference can be observed using TAQ data. Another commenter presented their study arguing that...
longer queues lead to increased transaction costs, and connected longer queues with the practice of paying rebates.572 Another Commenter referenced a study suggesting that trading costs vary across exchanges.573 Although the above listed commenters all felt that the evidence did suggest that fees and rebates led to conflicts of interest, other commenters did not come to the same conclusion. One commenter felt that there was "no evidence that fee practices are harming investors or interfering with fair competition" and consequently felt that a Pilot was not justified.574 The studies and analysis presented by Commenters and the studies discussed below have significant limitations with regard to establishing causal links between fees and rebates and order routing decisions. These limitations fall primarily into two results of the studies cannot make a significant limitations with regard to causal connections needed to inform on potential conflicts of interest.

When a study's results are representative, the results can be applied across a broadly defined group. Drawing broad inferences from limited samples could be problematic because the results might be specific to specific securities, broker-dealers, or trading venues. In the context of regulatory decision-making, representative results should inform on the potential effects over the scope of the market covered by the decision. When results are not representative of the full scope of a regulatory decision, that regulatory decision may have an unpredictable effect over the part not represented by the results. For example, if the results of a study cover only certain types of issuers and therefore, any regulatory changes based on such studies may have unanticipated effects on the types of issuers not included in the study.

In addition to limitations in how representative results may be, existing studies cannot test for causal relationships between transaction fees and order routing decisions, even around fee revisions. Because transaction-based fees and order routing decisions could be jointly determined, researchers cannot readily disentangle the direction of 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 frequently modify their fees.575 In practice, researchers attempt to identify and measure causal relationships between fees and order routing decisions, even around fee revisions. Because transaction-based fees and order routing decisions could be jointly determined, researchers cannot readily disentangle the direction of 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

The Commission disagrees with one commenter who felt that sufficient data existed to move forward with regulation prohibiting rebates because "the theory is well-accepted, and no prior evidence contradicts it."577 In the absence of causal data, regulators can use theory—and their best judgment based on their expertise—to guide their decision making. However, in this case, for the reasons discussed throughout this release, the Commission believes that empirically assessing the various theories, causal impacts, and effects of the transaction fee-and rebate pricing model is appropriate.

i. Battalio Equity Market Study

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.578 By routing orders to exchanges that pay high rebates, broker-dealers may engage in rebate capture at the expense of client execution.579 Using data obtained from mandatory Rule 606 disclosures over a two-month window,580 the Battalio Equity Market Study 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 charged the highest access fees). 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 filling the order book, the speed of order execution, and 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.

Although the Battalio study provides evidence suggestive of conflicts of interest, the study has a number of limitations which render the Commission unable to use this study to robustly determine that rebates cause costly conflicts of interest for broker-dealers. 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.581 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.582 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 exchanges 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 reports 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).583 See supra note 310 and accompanying text and infra Section IV.B.1.b., "Rule 606 Data."

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. See Battalio Equity Market Study, supra note 530.584

573 See IEX Letter IV, at 9
574 See AGF Letter, at 1
575 See CBOE Letter I, at 5 See also Nasdaq Letter I, at II–12
576 See supra note 310 and accompanying text and infra Section IV.B.1.b., "Rule 606 Data."
577 See infra Section IV.A.2.b.
578 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 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 5307, at 2193.
579 See Battalio Equity Market Study, supra note 5307. See also supra Section IV.A.2.b, for an overview of the potential conflicts of interest that emerge.
581 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. See Battalio Equity Market Study, supra note 530.
November 2012). As discussed above, approximately 400 broker-dealers are members of at least one national securities exchange. The ten retail brokers analyzed in the Battalio Equity Market Study make up approximately 21% 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 in 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.

In sum, the absence of an exogenous shock to access fee caps or rebates outside the control of exchanges leaves the authors unable to definitively determine the causes of broker-dealers’ order routing decisions. 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.

ii. The Nasdaq Experiment

Nasdaq independently conducted an experiment, 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. Nasdaq produced two reports on the experiment and an academic study examining the experiment was submitted as a comment. Both Nasdaq’s first study report and the Swan study indicate that when Nasdaq lowered fees and rebates they lost market share in the stocks with lower fees and rebates. According to analysis in the Swan study, the market share that Nasdaq lost appeared to migrate to other make-take venues with higher fees and rebates. Additionally, both Nasdaq’s analysis as well as the Swan study find that the experiment led to a decrease in the fraction of time that Nasdaq quoted at the NBBO. The Swan study also estimated a variety of additional tests to measure the impact of the experiment on various aspects of market quality. The results of these tests are mixed. The Swan study found that the Nasdaq experiment improved market quality on Nasdaq in terms of improved fill rates and fill times as well as borrower cum-fee effective spreads and cum-fee realized spreads.

While cum-rebate effective spreads, fill rates, and fill times improve on the experiment, the Swan study finds that the experiment diminished market quality in terms of quoted spreads and raw realized spreads which both increase during the experiment. The Swan study shows that some measures of market quality were unchanged by the Nasdaq experiment, namely, the Swan study finds no change in raw effective spread. In Nasdaq’s second report on the experiment they examine various market quality measures and find no impact on effective spread, relative effective spread, quoted spread, relative quoted spread, displayed dollar depth at the NBBO, time between quote updates on the consolidated tape, and time between price changes in the NBBO on the consolidated tape.

In examining the impact of the experiment on price efficiency, the Swan study finds mixed evidence that prices quoted on Nasdaq become less efficient during the experiment. First, the Swan study finds that global price impact declines during the experiment. Price impact is commonly employed as a measure of the informativeness of trades. The Swan study explains the decline in price impact with a theoretical model which suggests that rebates subsidize market makers for the adverse selection costs that they bear thereby allowing them the ability to bear additional adverse selection which induces informed traders to trade more aggressively in the presence of rebates. Consequently, their model predicts that informed trades will congregate on exchanges with high rebates. Additionally, the Swan study finds using variance ratios that price efficiency declines on Nasdaq during the experiment. However when using autocorrelation of trades as a measure of price efficiency, the tests indicate a decrease in autocorrelation—suggesting more efficient stock prices on Nasdaq. Additional analysis on price efficiency comes from Nasdaq’s second report which explores the impact of their experiment on market wide price efficiency and finds no change in price impact, autocorrelation of trades, or variance ratios.

The Swan study also empirically examines how the Nasdaq experiment impacted the trading behavior of high frequency traders (“HFTs”) and non-HFTs and finds that as a result of the experiment HFTs added liquidity less often and took liquidity more often while non-HFTs did the opposite. Nasdaq also examined trading behavior and 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. 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 28.7% pre-pilot to 41.5% in the pilot period.

583 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 satisfied the NYSE as the primary listing exchange. Nasdaq released two reports see infra note 584 (examining the changes to a number of metrics related to market quality).

584 The first report provided by Nasdaq can be found on their webpage http://nasdaq.com/AccessFeeExperiment (“Nasdaq’s first report”, or the “First Nasdaq report”). The second report provided by Nasdaq can be found at http://people.stern.nyu.edu/hasbrou/SternMicroMtG/
While Nasdaq believes that the results from their study do not support the need for a pilot, the Commission disagrees because the Nasdaq experiment and the subsequent analysis suffers from the following limitations. First, the Nasdaq experiment may not be representative of the broader market. Nasdaq selected 14 stocks to be part of the analysis, which represent 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), 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. The small number of stocks makes interpretation of the results more difficult because a change to such a small number of stocks may not be significant enough for traders to alter their behavior.

Additionally, the Commission is not able to make inference about the effect of a market wide change to fees and rebates from the Nasdaq experiment because, as noted by multiple commenters, the effects of the experiment apply to a single exchange: Nasdaq. As the other equities exchanges did not have similar changes to transaction-based fees and rebates, any inferences 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.

Lastly, none of the analysis of the Nasdaq study analyzes 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 fees and rebates and potential conflicts of interest, the limited representativeness of the Nasdaq sample would limit the generality of the study.

iii. Options Market Studies

Three studies have examined exogenous shifts between maker-taker and payment for order flow pricing models on U.S. options exchanges. 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. 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. 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. For example, 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. Each of these models is likely to create potential conflicts of interest that could affect how broker-dealers route their customer orders, 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 or impacts on market and execution quality that did not previously exist. Therefore, the Commission 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 and impacts on market and execution quality driven by the maker-taker and taker-maker models or to inform the Commission about future regulatory decisions regarding transaction-based fee models. Additionally, these studies lack causality. Specifically the decision to invert an exchange from a taker/maker to a maker/taker exchange, which these studies are based on, is an endogenous decision, and therefore the studies lack the ability to make causal inference further hindering the Commission's ability to draw inference from these studies.

b. Limitations of Existing and Anticipated Data

Some Commenters suggested that existing data sources could be employed in lieu of a Pilot to study the Commission's objectives. Another Commenter argued that enhancing existing data would be sufficient. To this end, the Commission considered whether a number of existing data sources could be used independently or in combination to relate transaction-based fees to order routing and execution quality. This section discusses these data sources. For instance, in the Battalio Equity Market Study and the Nasdaq study discussed above, the authors employed some combination of Rule 606 data, proprietary broker-dealer data, the Trade and Quote (TAQ) database, and proprietary exchange data. In addition, while not employed in previous studies, CAT data, OATS data, Rule 605 data, Form ATS—N data, and exchanges' Form 19b-4 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, and fees.
and other arrangements. As noted above, several data sources provide information on order routing and execution quality. While researchers could use these data sources to produce some representative results regarding the relation between transaction-based fees, order routing, and execution quality, the Commission believes that available data has several limitations, which include: Granularity, completeness, periodicity, format, and availability.

i. Rule 606 Data

Rule 606 requires broker-dealers to make publicly available quarterly reports that provide an overview of their routing practices on certain orders in NMS securities. As amended, broker-dealers must provide information for the ten venues to which the largest number of total non-directed orders were routed for execution and for any venue to which five percent or more of non-directed orders were routed for execution. Rule 606 disclosures also require broker-dealers to disclose in a standardized format material aspects of their relationships with trading venues to which they route orders, including a description of, among other things, the payment for order flow and any profit sharing relationships, which, like rebates, could influence the broker-dealer's order routing decision and potentially lead to potential conflicts of interest for broker-dealers when routing orders.603 Researchers and other analysts interested in order routing data can download these forms quarterly directly from broker-dealer websites.

Some commenters believed that the amendments to the Rule 606 data would render the Pilot unnecessary.604 Indeed, a few commenters suggested that Rule 606 data, perhaps combined with other existing data, would be sufficient to study conflicts of interest among broker-dealers.605 The Commission disagrees that this type of analysis would serve the purposes of the Pilot.606 Such an approach would not adequately address the Pilot's broader purpose to study the effects that exchange transaction fee- and rebate pricing models may have on order routing behavior, execution quality, and market quality, in addition to conflicts of interest between brokers and their customers that are presented when exchanges pay rebates.607 Further, disclosure alone would not provide an exogenous shock that generates measurable responses capable of providing insight into the effects of fees and rebates on the markets and market participant behavior.

In addition, the quarterly frequency of the public 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).608 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. Specifically, the 606 data is aggregated at the quarterly level. This frequency will not enable researchers to look at the full picture of how a broker-dealer responds to fees because exchanges on average revise their fee schedules 6.7 times per year. With 13 exchanges this amounts to 87 fee changes per year. Consequently, the fees that exchanges charge in a given quarter relative to the other exchanges will likely change multiple times within a quarter. Consequently, Rule 606 data is limited in how it can be employed to evaluate comprehensively the impact of order flow responding to fees and rebates.

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. 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.

In sum, the Commission believes that the amended Rule 606 data will provide useful information to complement the Pilot; however it is insufficient by itself to determine the impact of exchange transaction fees and rebates on broker-dealer order routing decisions, or inform the Commission of the impact of exchange pricing on market and execution quality.609

ii. CAT Data and OATS Data

Once the CAT Phase 1 becomes operational,610 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 cancellations, and order executions. Likewise, the Order Audit Trail Systems (OATS) data could inform on order routing decisions.611 The OATS data tracks customer orders from the receipt of the order through execution or cancellation. Information in the OATS data reflects the terms of the order, including the security, price, shares, account type, handling instructions, and side of the market for which the order was placed; where the order was routed for execution; modifications to the order; and execution information, including the capacity in which the firm acted in the trade.

Although the CAT and OATS data could feasibly be used to produce order routing data similar to that required by the Pilot, as indicated by one commenter, without the corresponding "randomized trial," the use of OATS data alone would be insufficient to determine causality in the effect of fees and rebates on order routing decisions because it would not be possible to determine from the data whether fees respond to changes in order routing decisions or whether order routing decisions respond to changes in fees. Consequently, in the absence of an exogenous shock to fees, CAT and OATS data cannot provide the Commission with robust evidence about how access fees impact order routing decisions.612

iii. Proprietary Broker-Dealer Data

Proprietary data from broker-dealers or exchanges could also provide information about order routing decisions. 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 orders received by an exchange, including which members routed orders to the exchange, whether the orders execute, and the price, size, and time of execution.

603 See Section III.B.3 of Amendments to Order Handling Disclosure, supra note 310.
605 See STANY Letter, at 2; Nasdaq Letter I, at 11-12; ERA Letter, at 1.
606 See also IEX Letter I, at 9.
607 See, e.g., ICI Letter II at 3.
608 Not every fee schedule revision pertains to transaction 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.
609 Multiple commenters expressed views similar to this and urged the Commission to adopt 606 amendments prior to the adoption of the Pilot. See, e.g., Citadel Letter, at 3; OMERS Letter, at 3; ICI Letter I, at 5-6; Fidelity Letter, at 2; IEX Letter II, at 9.
610 See supra Section II.E.3.vi.
611 See Nasdaq Letter I, at 4.
execution. Indeed, several commenters stated that if 606 data were not sufficient to answer the Commission’s questions about broker dealer routing decisions, then the Commission could request routing tables and information directly from broker-dealers or request other Transaction Cost Analysis (TCA) data to supplement the 606 data. While these data would provide potentially more granular data about order routing, as proprietary datasets, there is no standard format that exchanges or broker-dealers use to aggregate this data, which makes cross-broker-dealer or cross-exchange comparison difficult. Even if a dataset of proprietary data could be produced from data obtained directly from exchanges or broker-dealers, the data would still lack an exogenous shock to fees which is necessary to determine a causal link between order routing decisions and exchange fees.

iv. Rule 605 Data

A few commenters suggested that Rule 605 data used in conjunction with other data such as Rule 606 data, could provide information about broker dealer conflicts of interest. 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. 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.

While Rule 605 data is available to researchers and may provide information about execution quality, it too has 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. 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. Finally, Rule 605 data is limited in that it covers only held orders and orders of less than 10,000 shares.

v. TAQ Data

Beyond Rule 605 data, researchers could also use the TAQ database as a means of measuring order execution quality or estimating market share to use as a measure for order routing decisions. The TAQ database is publicly available (for a fee) from NYSE and provides access to all trades and top of the book quotes for NMS securities, from which researchers and other analysts can estimate trade-based measures of execution quality such as effective spreads. While TAQ data are available to academic researchers, TAQ has a number of limitations in its precision in the measurement of order routing and execution quality. An exchange’s market share can differ significantly from its share of orders received because exchanges reroute orders they cannot execute at the best prices and some exchanges reroute more orders than others. In addition, TAQ doesn’t provide information on the brokers or dealers underlying the trades or quotes, so TAQ cannot tell us about the decisions of individual brokers. While TAQ facilitates the estimation of trade and quote-based measures of execution and market quality, it does not facilitate the estimation of order-based measures of execution quality, which are more precise than trade-based measures. In particular, order-based measures allow for the consideration of order size, which can be different and often larger than trade size. Order-based measures also consider the costs of latency whereas trade-based measures do not. Additionally, since TAQ only provides data on trades it does not provide a means of estimating execution quality for limit orders.

vi. Information From Exchange 19b-4 Filings

Finally, researchers both in and outside of the Commission, who wish to link fees and rebates to various outcomes, 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 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.

A key limitation to this data, particularly for researchers outside the Commission, is that exchanges use bespoke terminology to classify their fees and rebates. Consequently, identifying comparable fees across exchanges is difficult. 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.

Lastly, even if a comprehensive dataset of fee changes were created, it would not be sufficient by itself to study the link between order routing decisions and fees because the dataset can only tell when and how an exchange revised fees, and not why the fee changed or if the fee change affected order routing behavior. In essence the data still lacks the ability to establish a causal connection between fee changes and order routing decisions.

vii. Form ATS-N

Following implementation in January 2019, the public will have more information on ATS conflicts of interest and fees. In particular, in June 2018, the Commission adopted amendments to 17 CFR 242.300 through 242.303 (Regulation ATS) and 17 CFR 240.3a1-1 (Rule 3a1-1 under the Exchange Act). As part of these amendments, NMS Stock ATSs will be required to
publicly report on new Form ATS–N information about the manner in which the ATS operates and activities of the broker-dealer operator and its affiliates, as well as potential conflicts of interest within the NMS Stock ATSS. While Form ATS–N will contain high level information on operations and affiliates of the ATS, it will not contain detailed information, such as ATS routing tables. Therefore, it would not contain detailed information on how fees and rebates affect the order routing decisions of the ATS.

Form ATS–N also will require ATSs to provide public disclosures about the different types of fees they charge, along with the ranges of those fees and whether they are bundled with any other services. However this information would not be nearly as granular as the exact fee disclosures that would be required by the Pilot. Nor do they provide as much information as the fee disclosures that exchanges are currently required to disclose. These limitations make it difficult to use the ATS–N data to make causal inference about the impact of fees and rebates on order routing decisions.

c. The Potential To Study the Causal Link Between Fees, Rebates, and Conflicts of Interest Absent a Pilot

Absent a Pilot, the Commission does not believe it would have comprehensive, empirical evidence to study the effects on the market that the Pilot is intended to study. In particular, as indicated above, the Commission does not believe the theoretical evidence on incentives and potential other effects are indicative of broker-dealers actually acting on those incentives. Further, even if the data sources above did not suffer from their limitations, researchers would struggle to identify the causality necessary to robustly link fee and rebate effects on order routing to order execution quality.

Indeed, this link requires two steps: First establishing a causal link between fees and rebates and order routing and then between fee-based order routing and order execution quality. Even with perfect data, any study linking fees and rebates to order routing would suffer from an inability to draw conclusions about causality. While such a study might find a correlation between fees/rebates and order routing decisions, the researchers would be unable to conclude which event was driving which. In particular, since exchanges compete for market share, it is reasonable to expect that exchanges change their fees and rebates in response to changes in order routing decisions by broker dealers. If this is the case it would be the order routing decisions that drive the exchange fees. The data alone do not allow researchers to distinguish whether order routing determines fees or whether fees determine order routing.

Similarly, existing data, even if it didn’t have the limitations above, would not enable researchers to infer the causal impact of fee-based order routing on order execution quality. If fees and execution quality are linked, then exchanges may change their fees in response to changes in execution quality. For example, raising rebates might attract more liquidity providers and induce additional order flow to the exchange. An exchange that is experiencing low execution quality might raise rebates to address this problem. Under these circumstances, an empirical analysis that lacks an exogenous shock to fees/rebates might erroneously conclude that increased rebates cause a conflict of interest because they are correlated with low execution quality and increased order flow. Such a conclusion might lead the Commission to draw incorrect conclusions.

2. Current Market Environment

This section provides an overview of the competitive landscape that could be affected as a result of revisions to the transaction-based fee structure required by the Pilot. Where information is currently available to the Commission, a description of the current practices of exchanges along dimensions that are relevant to the Pilot (e.g., summary information on their current fee schedule or the frequency of fee revisions) are included. The Commission requested that commenters provide additional information to inform the baseline as part of the proposal. Where available, the baseline has been supplemented to reflect additional baseline information that was received from commenters.

a. Market for Trading Services

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

Since the adoption of Regulation NMS in 2005, the market for trading services has become more fragmented and competitive. Of the 13 exchanges, seven are maker-taker exchanges and four are maker-pricing exchanges, as shown in Table 1; the NYSE American and IEX operate as flat-fee exchanges. 619 Since Regulation NMS was adopted in 2005, the market for trading services has 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. 620 Several studies have suggested that transaction-based fee pricing partially drove the increase in the number of U.S. equities exchanges since 2005. 621

Execution services are a lucrative business, which encourages new trading centers to enter the market in the hopes of capturing rents associated with order

619 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 IEX, Investors Exchange Fee Schedule (August 1, 2018), https://iextrading.com/trading/fees (last visited September 18, 2018). As of March 2018, EDGA is no longer operating as a taker-maker exchange, but is also operating as a flat-fee venue. See Choe, Choe US Equities (2018) http://markets.cboe.com/us/ equities/ (last visited September 18, 2018).

620 While the number of exchanges went from eight to 13 exchanges between 2005 and 2015, there were other non-exchange trading venues in 2005 (e.g., ECNs), which were displayed markets that utilized a standard price-time-priority market model similar to exchanges. 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—Y, EDGA, and EDOX, which all operated as ATSS in 2005, are all subsidiaries of Choe Global Market, Inc. IEX became a registered exchange in 2018. Further, NSX (NYSE National) existed as an exchange in 2005, but halted operations in 2016. It was acquired by NYSE/IEX in January 2017 and was re-opened for trading in May 2018. See Intercontinental Exchange, Inc. Finalizes Acquisition of National Stock Exchange, Bus. Wire: News (Jan. 31, 2017, 6:28 p.m.) https://www.businesswire.com/news/home/20170131006474/en/. 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. 621 See, e.g., Angel, Harris, & Spatt, supra note 530; Harris, supra note 530.
Table 1 highlights that the market share of trading volume among exchanges is not very concentrated. Although NYSE and Nasdaq have the largest market share of approximately 12% and 16%, respectively, among the exchanges, as of July 2018, these two exchanges collectively account for less than 30% of the total market share of trading volume for NMS stocks, indicating that the market for trading services has become decentralized, and has become more so over time. For instance, between 2004 and 2013, the NYSE’s market share of NYSE-listed stocks declined from approximately 80% to 20%, while market share of other exchanges and off-exchange trading centers has increased.632 This decentralization provides market participants with a choice among venues when they route orders, and may also encourage exchanges to compete to attract order flow.

A number of commenters suggested that exchanges compete intensely with each other to attract order flow.633 Transaction-based fees represent one means by which national securities exchanges may compete for order flow, and exchanges may adopt business models that focus on attracting order flow by offering large rebates or charging competitive fees. Exchanges may also develop different business models to attract different types of order flow.634 For example, maker-taker venues may offer large rebates to attract liquidity supplying orders.635 They may then rely on this liquidity to attract marketable orders, to which they charge a high transaction fee in order to both offset the cost of the large rebates and to ensure a profitable transaction pricing model. Alternatively, inverted exchanges offer higher rebates to compete to attract marketable orders. Exchanges may also compete for order flow on other dimensions as well, by offering better execution quality, better technology, and innovations in order types and other trading mechanisms.636

In addition to competing with other U.S. equities exchanges, exchanges also compete for order flow with off-exchange trading centers, including ATSs, internalizers, and others. One way exchanges compete with off-exchange trading venues is through the use of rebates. For example, a number of commenters suggested exchanges use rebates to compete to attract limit orders to supply liquidity. See, e.g., NASDAQ Letter I, at 12; Virtu Letter, at 3; State Street Letter, at 2.

632 See, e.g., Angel, Harris, & Spatt, supra note 530; Harris, supra note 530.
633 See Proposing Release, supra note 2, at 13042. See also SG Letter at 2.
634 See supra notes 3 and 4.
635 Shares are computed based on trading volume in August 2018. Market shares for the exchanges reported do not add up to 100%, because approximately 34% of trading volume is executed off-exchange on over-the-counter venues. These market share figures differ slightly from the ones in footnote 9 of Cboe Letter I, which provided market share for May 2018. While these differences could result from the focus on more recent data, the Commission is not sure if the differences could also be driven by differing methodologies. Nonetheless, the figures in Cboe Letter I are consistent with the conclusions in this release. Also, the off-exchange share differs slightly from the 39% share in Nasdaq Letter I, at 2. Note that the off-exchange share in the Proposing Release was 40%.
636 Since July 2017, NYSE American has not been 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 (July 26, 2018), https://www.nyse.com/publicdocs/nyse/markets/nyse-american/NYSE American Equities Price List.pdf. 637 NYSE acquired NYX in January 2017, and the exchange is now known as NYSE National. The exchange was re-opened for trading in May 2018 as taker-maker exchange.
638 See Angel, Harris, & Spatt, supra note 5307, Figures 2.17 and 2.18. Although less evident than for NYSE-listed securities, the effect is similar for the Nasdaq market.
639 See, e.g., CBOE Letter I, at 2; NASDAQ Letter I, at 11–13. One commenter suggested that in the Proposal, the Commission made the assumption that exchange groups had market power without providing evidence to support the assumption. This commenter also argued that no exchange group controls even 25 percent of market share and that competition is robust between and among equities exchanges. See NASDAQ Letter I, at 12–13.

One commenter suggested that in the Proposal, the Commission failed to account for the two-sided nature of exchange platforms when assessing the competitive impact of the Proposal. See NASDAQ Letter II, at 4–5. In the Proposal, the Commission separately discussed the potential impact of the Pilot on the competition for trading volume, see the Proposal, supra note 2, at 13057. The Commission also discussed some ways the Pilot could potentially impact marketable and nonmarketable order flow, see the Proposal, supra note 2, at 13057. Additionally, in Section IV.D.2.a, the Commission separately discusses the potential effects of the Pilot on marketable and nonmarketable order flow.

631 A number of commenters said exchanges use rebates to compete to attract limit orders to supply liquidity. See, e.g., NASDAQ Letter I, at 12; Virtu Letter, at 3; State Street Letter, at 2.
632 One commenter also suggested that exchanges also compete to attract liquidity using many costly features, including rebates, incentive programs, superior execution systems, regulatory quality, and customer service. See NASDAQ Letter I, at 12.
of commenters argued that one way exchanges compete with off-exchange trading venues is by using liquidity rebates to attract liquidity and narrow the displayed spread, which makes it more expensive for off-exchange trading venues to either match or improve upon the NBBO. Exchange transaction fees may also affect competition between exchanges and off-exchange trading venues. For example, commenters suggested that broker-dealers may opt to route order flow off-exchange in order to avoid higher transaction fees charged by exchanges. Off-exchange trading venues may also compete with exchanges to attract order flow by offering more flexibility in how they execute orders. One commenter noted that "market participants choose to send orders to off-exchange venues for reasons other than avoiding fees," including "investors anonymity, the ability to trade in more granular tick sizes, the flexibility to segment the treatment of different types of clients, the ability to choose trading counterparties, and the ability to accommodate customer errors." 635

Off-exchange trading makes up a substantial fraction of total volume, as approximately 34% of all transaction reports are routed using the NYSE and Nasdaq Trade Reporting Facilities as of August 2018. Of that off-exchange NMS share volume, approximately 14% was attributable to ATSs, of which 34 traded NMS securities as of August 2018. The remaining 21% of off-exchange share volume is routed to other off-exchange trading centers, such as internalizers. 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 exchanges, which may provide different incentives to broker-dealers in order to attract this order flow, including transaction fees and rebates. We discuss the current levels of transaction-based fees in Section IV.B.2.e below.

b. Market for Liquidity Provision

Several commenters discussed the importance of liquidity providers to an exchange’s ability to compete in the market for trading services. Within the exchange framework, liquidity providers, such as market makers, other proprietary traders, and investors, compete to supply liquidity to liquidity demanders. They compete by posting displayed limit orders on exchanges, or by posting undisplayed limit orders on exchanges or ATSs. Liquidity providers profit by buying at a price lower than the price at which they sell and/or by collecting rebates that are greater than the fees they pay. Hence, an execution is a necessary means of profiting from liquidity provision, whether the liquidity provider seeks to profit from price changes or rebates.

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 exchanges, which may provide different incentives to broker-dealers in order to attract this order flow, including transaction fees and rebates. We discuss the current levels of transaction-based fees in Section IV.B.2.e below.

b. Market for Liquidity Provision

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Liquidity providers, and traders more generally, seek to manage their trading profits by managing the tradeoff between the price they get in an execution, the certainty of execution, and any adverse selection resulting from the execution. When a liquidity supplier more aggressively prices their limit order, they increase the chance that their order will execute, but they trade this off against the order executing at a worse price and increased chance of their order being adversely selected if it does execute.

To get an execution, the limit orders need to be at the top of a queue at a given price and venue and placed on a venue able to attract liquidity demanders. Displaying a limit order attracts liquidity demanders to the venue displaying the limit order, and thus improves the probability of execution, but could also increase the risk of being adversely selected, which reduces profits. For example, an algorithm that is skilled at identifying short-term price movements may be programmed to hit displayed limit buy orders at a price following a signal that the price is about to go down. In such a situation, the liquidity provider is unlikely to quickly sell at a price higher than the recent purchase, and therefore, these situations are costly for the liquidity provider. One way to attempt to reduce adverse selection costs is to not display the limit order. When the order is not displayed, the traders with the price signals may not see it and, as a result, would be less likely to pick it off. On the other hand, an undisplayed limit order also risks not getting executed when an execution would be profitable. For example, an undisplayed limit buy order is less likely to execute than a displayed limit buy order just prior to an increase in the price because marketable sell orders that do not anticipate the price increase are likely to route to venues with competitively priced limit buy orders and would not be able to identify which venues have undisplayed limit buy orders. Rebates and fees also affect where liquidity providers choose to supply liquidity. Maker-taker exchanges, which pay rebates to liquidity suppliers, provide them with extra revenue when trades are executed. This could encourage liquidity suppliers to post at more aggressive prices for some securities, subject to the fact that displayed quotes on stock exchanges must be priced in one-cent increments. However, competition among liquidity suppliers to earn rebates could lead to longer queues in an order book, which could decrease the chance that a liquidity supplier’s order executes unless they are at or near the front of the queue. In contrast, inverted exchanges, which charge liquidity suppliers a fee when they supply liquidity and offer a rebate to takers of liquidity, usually have shorter queue lengths and an economic incentive to take liquidity, which increases the chance that a liquidity supplier’s order executes.

c. Market for Broker-Dealer Services

The Commission considered the potential for the Pilot 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.

632 See also IEX Letter I, at 3; Credit Suisse Commentary, at 2.
633 See NASDAQ Letter I, at 5; Grasso Letter, at 4.
634 See www.finra.org/industry/Reg-Filing&Rulemaking/2018-0319.
636 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. 74774 (November 15, 2010) (hereinafter “Risk of Being Adversely Selected," supra note 530.
637 See Angel, Harris, & Spatt, supra note 530.
638 See e.g., IEX Letter I, at 3; Credit Suisse Commentary, at 2.
639 See IEX Letter I, at 3; Credit Suisse Commentary, at 2.
640 See NASDAQ Letter I, at 5; Grasso Letter, at 4.
641 See www.finra.org/industry/Reg-Filing&Rulemaking/2018-0319.

Continued
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. As of December 31, 2017, approximately 3,860 broker-dealers filed Form X-17a-5. These firms vary in size, with median assets of approximately $800,000, average assets of nearly $1 billion, and total assets across all broker-dealers of $4 trillion. The twenty largest broker-dealers held approximately 72% of the assets of broker-dealers overall, with total assets of $2.89 trillion, indicating the high degree of concentration in the industry. Of the 3,860 broker-dealers that filed Form X-17a-5, 397 are members of U.S. equities exchanges. Broker-dealers that are members of equities exchanges had, on average, other total assets than other broker-dealers, with median assets of $25.5 million, average assets of $9.2 billion, and total assets across all broker-dealers that are members of exchanges of $3.65 trillion.

d. Market for Assets Under Management

Many commenters expressed concern about the impact of the Pilot on the market for assets under management, particularly on exchange-traded products ("ETPs"). Asset management firms compete with each other in a segment of the market for assets under management. They offer different types of investment vehicles, such as mutual funds, close-end funds, and ETPs, which compete with each other to attract investor funds. Investor funds in an investment vehicle are pooled together and invested in financial assets, with investors sharing any profits or losses incurred by the investment vehicle according to each investor's interest in the vehicle. Asset management firms generally earn revenue by charging fees based on the value of the assets they manage on behalf of investors in their investment vehicles.

Investment vehicles compete with other investment vehicles that follow similar investment strategies to attract investor funds. They often rely on differences in expense ratios, tracking error, and redemption and trading characteristics when competing to attract investor funds.

One subset of investment vehicles are ETPs. ETPs differ from other investment vehicles in their trading and redemption characteristics. ETPs are investment vehicles that issue shares that can be bought or sold through the day on securities exchanges in the secondary market at a market-determined price. ETPs provide investors with a diverse set of investment options. While the first ETPHeld portfolios of securities that replicated the component securities of broad-based domestic stock market indexes. Some ETPs track more specialized indexes, including international equity indexes. Some ETPs focus on particular indices such as telecommunications or healthcare. Some ETPs seek to track highly customized or bespoke indexes, while others seek to provide a level of leveraged or inverse exposure to an index over a fixed period of time. Investors also have the ability to invest in ETPs that do not track a particular index and are actively managed.

A number of commenters noted that ETP issuers face strong competition within similar investment strategies and that small differences in fees and trading characteristics, such as spreads, daily volume, and intraday volatility, may be meaningful to market participants when deciding which ETPs to trade or invest in. As of September 2018, there were 2,003 ETPs categorized as exchange traded funds ("ETFs"). 223 ETPs categorized as non-ETP ETPs, and 18 ETPs categorized as ETMFs. As of this date, ETPs had total net assets of $3.74 trillion. The ten largest ETPs accounted for 28.0% of total ETF net assets and 27.8% of the average dollar trading volume on secondary markets.

As the statistics above indicate, ETPs represent the majority of ETPs, they possess characteristics of both mutual funds, which issue redeemable securities, and closed-end funds, which generally issue shares that trade at market-determined prices. Generally, financial securities exchange and are not redeemable. Similar to mutual funds, ETPs continuously offer their shares for sale. Unlike mutual funds, however, ETPs do not sell or redeem individual shares. Instead, "authorized participants" that have contractual arrangements with the ETF (or its distributor) purchase and redeem ETF shares only from the ETF in blocks called "creation units." An authorized participant that purchases a creation unit of ETF shares directly from the ETF deposits with the ETF a "basket" of securities and other assets identified by the ETF that day, and then receives the creation unit of securities exchanges. See fn. 10 and accompanying text in the ETF Proposal. ETPs also operate under exemptive orders that allow them to register as investment companies under the Investment Company Act, but they have different disclosure requirements than ETFs. See, e.g., Eaton Vance Management, et al., Investment Company Act Rel. Nos. 31333 (Nov. 6, 2014) (notice) and 31391 (Dec. 2, 2014) (order).

The Investment Company Act defines "redeemable security" as any security that allows the holder to receive its or her proportionate share of the issuer's current net assets upon presentation to the issuer. See 15 U.S.C. 80a-2(a)(32). While closed-end fund shares are not redeemable, certain closed-end funds may elect to repurchase their shares at periodic intervals pursuant to rule 22c-3 under the Investment Company Act ("interval funds"). Other closed-end funds may repurchase their shares in tender offers pursuant to rule 13e-4 under the Exchange Act.

The Commission's exemptive orders typically contain a representation by the applicant that an authorized participant will be either: (a) A broker or other participant in the continuous net settlement system of the National Securities Clearing Corporation, a clearing agency registered with the Commission and affiliated with the Depository Trust Company ("DTC"), or (b) a DTC participant, which has executed a participation agreement with the ETF's distributor and transfer agent with respect to the creation and redemption of creation units. See, e.g., Emerging Global Advisors, LLC, et al., Investment Company Act Release Nos. 30382 (February 13, 2013), 78 FR 4190 (February 20, 2013) (notice) and 30423 (March 12, 2013) (order) and related application. In June 2013, the Commission proposed a new rule under the Investment Company Act of 1940 that would permit ETFs that satisfy certain conditions to operate without obtaining an exemptive order. In response to this proposed rule, the Commission proposed to rescind certain exemptive orders that have been granted to ETFs and their sponsors. See Securities Exchange Act Release No. 10515 (June 28, 2016), 81 FR 37332 (July 31, 2016) ("ETF Proposal").
ETF shares in return for those assets. An ETF may impose fees in connection with the purchase or redemption of creation units that are intended to defray operational processing and brokerage costs to prevent possible shareholder dilution ("transaction fees").

The basket may not reflect a pro rata slice of an ETF's portfolio holdings. Subject to the terms of ETF's negative relief, an ETF may substitute other securities or cash in the basket for some or all of the ETF's portfolio holdings. Restrictions related to flexibility in baskets have varied over time. See the ETF Proposal, supra note 651, at 37354–58.

Non-ETF ETPs also offer creation and redemption processes. Some Non-ETF ETPs that are organized as pooled investment vehicles may offer creation and redemption processes similar to ETFs. Other Non-ETF ETPs may offer creations or redemptions on a less frequent basis. For example, some ETNs may only be redeemed weekly.

An authorized participant may act as a principal for its own account when purchasing or redeeming creation units from the ETF. Authorized participants also may act as agent for others, such as market makers, proprietary trading firms, hedge funds or other institutional investors, and receive fees for processing creation units on their behalf. See Abner, D.J. The ETF Handbook: How to Value and Trade Exchange-Traded Funds, 2nd ed., Wiley Finance (2016) ("ETF Handbook").


NSCC is the sole provider of clearing services for ETF primary market transactions. Whether a creation or redemption order is eligible to be processed through NSCC depends on the eligibility for NSCC processing of the securities in the ETF's basket. See id.
U.S. exchanges have 18 access fee categories and 21 rebate categories associated with these fee schedules. For the maker-taker exchanges, access fees do not exceed the Rule 610(c) cap at $0.0030, but are as little as zero in some fee categories for some exchanges; maker-taker 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.

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 (August 1, 2013–July 31, 2018). Exchanges, on average, have changed their fee schedules 34 times in the last five years, 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 2018**

<table>
<thead>
<tr>
<th>Exchange</th>
<th>Fee model</th>
<th>Number of revisions (5 years)</th>
<th>Date of fee schedule</th>
<th>Fees (# of categories)</th>
<th>Rebates (# of categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cboe BZX</td>
<td>Maker-Taker</td>
<td>54</td>
<td>8/16/2018</td>
<td>$0.0000-$0.0033</td>
<td>($0.0000)-(0.0032)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(29)</td>
<td>(18)</td>
</tr>
<tr>
<td>Cboe BYX</td>
<td>Taker-Maker</td>
<td>51</td>
<td>8/9/2018</td>
<td>$0.0000-$0.0033</td>
<td>($0.0005)-(0.0022)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(40)</td>
<td>(12)</td>
</tr>
<tr>
<td>Cboe EDGA</td>
<td>Taker-Maker</td>
<td>41</td>
<td>8/1/2018</td>
<td>$0.0000-$0.0032</td>
<td>($0.0004)-(0.0027)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(48)</td>
<td>(14)</td>
</tr>
<tr>
<td>Cboe EDGX</td>
<td>Maker-Taker</td>
<td>53</td>
<td>8/16/2018</td>
<td>$0.0000-$0.0032</td>
<td>$0.0000-(0.0032)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(37)</td>
<td>(20)</td>
</tr>
<tr>
<td>BX</td>
<td>Taker-Maker</td>
<td>29</td>
<td>7/20/2018</td>
<td>$0.0005-$0.0030</td>
<td>$0.0000-(0.0021)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(13)</td>
<td>(19)</td>
</tr>
<tr>
<td>Phlx (PSX)</td>
<td>Maker-Taker</td>
<td>24</td>
<td>5/21/2018</td>
<td>$0.0028-$0.0030</td>
<td>$0.0000-(0.0030)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(31)</td>
<td>(8)</td>
</tr>
<tr>
<td>Nasdaq</td>
<td>Maker-Taker</td>
<td>54</td>
<td>7/25/2018</td>
<td>$0.0000-$0.0030</td>
<td>$0.0000-(0.00325)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4)</td>
<td>(36)</td>
</tr>
<tr>
<td>NYSE Arca</td>
<td>Maker-Taker</td>
<td>51</td>
<td>8/1/2018</td>
<td>$0.0005-$0.0035</td>
<td>($0.0002)-(0.0035)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(68)</td>
<td>(65)</td>
</tr>
<tr>
<td>NYSE American</td>
<td>Flat</td>
<td>9</td>
<td>7/26/2018</td>
<td>$0.0002-$0.0030</td>
<td>$0.0000-(0.0045)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(12)</td>
<td>(4)</td>
</tr>
<tr>
<td>NYSE</td>
<td>Taker-Maker</td>
<td>42</td>
<td>8/10/2018</td>
<td>$0.0003-$0.0030</td>
<td>$0.0000-(0.0045)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(20)</td>
<td>(41)</td>
</tr>
<tr>
<td>NYSE National</td>
<td>Maker-Taker</td>
<td>11</td>
<td>7/26/2018</td>
<td>$0.0003-$0.0025</td>
<td>($0.0002)-(0.0020)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(16)</td>
<td>(2)</td>
</tr>
<tr>
<td>CHX</td>
<td>Maker-Taker</td>
<td>8</td>
<td>4/26/2018</td>
<td>$0.0007-$0.0040</td>
<td>($0.0009)-(0.0020)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(5)</td>
<td>(2)</td>
</tr>
<tr>
<td>IEX</td>
<td>Flat</td>
<td>10</td>
<td>8/1/2018</td>
<td>$0.0009</td>
<td>$0.0009</td>
</tr>
</tbody>
</table>

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 2017 capturing the net (of rebates) transactions-based fee revenues, the Nasdaq exchanges (Nasdaq, BX, and PSX) earned $253 million. Based on the same measure the NYSE-affiliated exchanges (NYSE, NYSE Arca, NYSE American, and NYSE National) earned $196 million in transaction-based fees net of rebates, while the BATS Global Markets (now, Cboe BZX, Cboe BYX, Cboe EDGA, and Cboe EGDX), for the year ended December 31, 2017, earned $153 million in transaction-based fees net of rebates. Neither CHX (which became a NYSE-affiliated exchange in 2018) 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 operating profits.
most recently reported fee schedule and the share volume of each exchange for July 25, 2017 through August 24, 2018. 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.

Table 3—Estimates of Annualized Per-Exchange Net Transaction-based Fee Revenues From Transaction-based Fees and Monthly Exchange Share Volume

[For July 25, 2018–August 24, 2018]

<table>
<thead>
<tr>
<th>Exchanges</th>
<th>Share volume (millions)</th>
<th>Annualized midpoint difference</th>
<th>Per share profit (median)</th>
<th>Annualized maximum difference</th>
<th>Per share profit (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cboe BZX</td>
<td>9,014</td>
<td>($486.75)</td>
<td>($0.0045)</td>
<td>$248.78</td>
<td>$0.0023</td>
</tr>
<tr>
<td>Cboe BYX</td>
<td>7,136</td>
<td>25.69</td>
<td>0.0030</td>
<td>239.76</td>
<td>0.0028</td>
</tr>
<tr>
<td>Cboe EDGA</td>
<td>1,853</td>
<td>1.11</td>
<td>0.00005</td>
<td>62.26</td>
<td>0.0028</td>
</tr>
<tr>
<td>Cboe EDGX</td>
<td>8,155</td>
<td>(4.90)</td>
<td>(0.00005)</td>
<td>205.77</td>
<td>0.0021</td>
</tr>
<tr>
<td>BX</td>
<td>4,389</td>
<td>36.87</td>
<td>0.00070</td>
<td>158.02</td>
<td>0.0030</td>
</tr>
<tr>
<td>Phlx (PSX)</td>
<td>1,035</td>
<td>16.15</td>
<td>0.00130</td>
<td>37.27</td>
<td>0.0030</td>
</tr>
<tr>
<td>Nasdaq</td>
<td>23,067</td>
<td>(34.63)</td>
<td>(0.00019)</td>
<td>831.14</td>
<td>0.0030</td>
</tr>
<tr>
<td>NYSE Aroa</td>
<td>13,024</td>
<td>23.44</td>
<td>0.00015</td>
<td>515.75</td>
<td>0.0033</td>
</tr>
<tr>
<td>NYSE American</td>
<td>473</td>
<td>(3.69)</td>
<td>(0.00005)</td>
<td>17.03</td>
<td>0.0030</td>
</tr>
<tr>
<td>NYSE</td>
<td>17,823</td>
<td>(128.33)</td>
<td>(0.00060)</td>
<td>641.63</td>
<td>0.0030</td>
</tr>
<tr>
<td>NYSE National</td>
<td>920</td>
<td>3.31</td>
<td>0.00200</td>
<td>25.40</td>
<td>0.0023</td>
</tr>
<tr>
<td>CHX</td>
<td>830</td>
<td>6.95</td>
<td>0.00030</td>
<td>30.87</td>
<td>0.0031</td>
</tr>
<tr>
<td>IEX</td>
<td>3,757</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

C. Analysis of Benefits and Costs of Transaction Fee Pilot

1. Benefits of Transaction Fee Pilot

The Commission expects that the benefits of the Pilot will fall into two categories: (1) More informed policy decisions, including more information about the economic impact of transaction-based fees and rebates, and (2) other benefits that may accrue to market participants for the duration of the Pilot. In this section we discuss each of the categories of benefits as well as potential limitations to the applicability of information to be drawn from the Pilot.


The Commission expects that the primary benefit of the Pilot will be to inform the Commission and public of the economic impact of exchange transaction-based fees and rebates. As a result, the Commission will have data to better inform its regulatory consideration of exchange transaction-based fee-and-rebate pricing models and fee changes, and the potential effects of changes to its regulatory approach concerning the same. In general, more informed regulatory decisions are more likely to result in regulatory approaches that better balance costs and benefits relative to regulatory decisions based on less precise information. In other words, many of the economic benefits derive from subsequent decisions that the Commission can neither predict nor commit to at this time. Indeed, the Commission cannot predict at this time whether the results of the Pilot will suggest any particular policy direction and recognizes that the results could suggest that existing exchange transaction-based fee caps and related rebates may be more beneficial to market participants than the policy alternatives examined in the Pilot.


See Proposing Release, supra note 2, at Section V.
is unable to draw unambiguous conclusions. For example, many
commenters disagreed on how reducing exchange fees and rebates affects the
competitive landscape between
exchanges and off-exchange venues in the
market for trading services, and the analysis here recognizes that many
competitive forces can drive order flow in either direction. The Pilot will
provide insight into the impact of
trading rebates on this
competitive landscape and can perhaps even shed light into the mechanism
behind any observed changes. Further,
one commenter argued that this
economic analysis “does not accurately
account for the actual level of orders
impacted by conflicted broker
routings.” The Commission believes that it cannot establish the actual level of
orders impacted by potentially and
conflicted broker routing with current
data and has designed the Pilot in part
to gather more data on the extent to
which rebates impact order routing
decisions, as explained in the section
that follows. The Commission also notes
that the Pilot seeks to study the effects
of exchange pricing models on market
quality and execution quality, which
could affect all orders. The Pilot will
facilitate the study of order flow among
different venues, which could provide
insights into whether changes in
exchange transaction-based fees and
rebates affect, for example, the level of
fragmentation. Existing literature
suggests that transaction-based pricing
has contributed to an increase in the
number of venues competing for order
flow over time. By offering rebates or
Linked Pricing, start-up maker-taker and
taker-maker exchanges 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 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.

Test Group 2 will provide insight into
the natural equilibrium level of access
demands, within the current regulatory
structure, in the absence of rebates and
Linked Pricing. As discussed above,
prohibiting exchanges from offering
Linked Pricing in Test Group 2 is
intended to complement and reinforce the
prohibition on rebates. Although
Rule 610(c) caps the maximum access
fee for exchanges at $0.0030, in the
absence of rebates and Linked Pricing,
competition among exchanges could
drive the average access fee to an
amount substantially below $0.0030. As
noted in Section IV.A.2, exchanges have a reduced competitive incentive to
reduce fees because doing so would
require reducing the rebates that attract
order flow to the exchange. Test Group 2
will allow competition among
exchanges, if pressure to offer high rebates or Linked Pricing, to
determine the level of access fees,
which the Commission and others can
observe during the Pilot. Like the other
examinations the Pilot can facilitate, the
results of an analysis of the equilibrium
access fees are not currently predictable
with much certainty.

The Pilot will facilitate studies of the
impact of exchange transaction-based
fees and rebates on liquidity by studying
metrics such as the quoted spread. 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 analysis below is Section
IV.C.2.b.iv identifies several reasons
that reducing fees and rebates could
increase or decrease quoted spreads.

The Pilot could provide information on
whether exchange fees and rebates affect
the liquidity of securities, as measured
by the quoted spreads, across different
test groups.

The Commission disagrees with
commenters who said that the Pilot was
inappropriate because of a one-size-fits-
all approach. In selecting the number of
securities for each Test Group, the
Commission staff divided NMS
securities into three common stock
strata and three ETP strata by liquidity
to determine how many stocks each
stratum requires to achieve statistical
power. The staff also separately
examined ETPs to determine how many
ETPs would be required to achieve
statistical power. Having statistical
power within each Test Group, and
within each Test Group by liquidity
strata, helps to ensure that researchers
will be able to use Pilot data to inform
the Commission regarding the issue of
whether different securities should have
the same regulatory treatment.

ii. How the Pilot Facilitates Study

The Pilot will simultaneously create
different fee environments, each of
which restricts transaction-based fees
differently to allow the study of the
prohibition of securities that are simultaneously in
different regulatory regimes. The study
of these comparisons will inform the
Commission about economic distortions
that may arise as a result of transaction-
based fees. Because of the size and
length of the Pilot, the Commission
believes that the different fee
environments over representative
subsamples of NMS securities, even
though implemented temporarily, will
produce effects on market participant
behavior that are identical or similar to
those that would arise under a similar permanent change. As explained below, three distinct features of the Pilot's design will facilitate analyses of the relationship, if any, between fees and potential economic distortions. Specifically, the Pilot is designed to provide (1) representative results; (2) more direct access to data that is currently unavailable, allowing for lengthy and labor-intensive effort to compile and process; and (3) sufficient information to determine causality. The following sections discuss in detail how each of these aspects of the Pilot could facilitate studies of the issues described above.

(1) Representative Results

In the context of the Pilot, representative results mean that the impact of the 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). Representative results are 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 by some combination of the following: Data from a single broker-dealer, a small sample of securities, a single exchange, or a short sample period. By contrast, the Commission believes that the Pilot, as designed, will produce more representative results. Specifically, as discussed in detail below, the Pilot will cover a large stratified sample of NMS stocks (including ETPs), both maker-taker and maker-taker exchanges, and transaction fee caps as well as a prohibition on rebates and linked pricing, and will 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 Pilot shall continue for up to one additional year.

The Commission believes that the Pilot will produce representative results, presenting a significant improvement on existing studies, because the 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, with average daily volume of 30,000 shares or more, 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. By including a sample of NMS stocks, the results are not influenced by the composition of the test strata, which allows for meaningful differences across the securities. The stratification of the stocks selected for each Test Group is designed to ensure that each Test Group has a similar composition within a given stratum, facilitating a comparison of Test Groups and the Control Group, which further supports the representativeness of results.

If, for instance, the Test Groups and Control Group had a different composition within strata, researchers outside the Commission 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 believes that the sample sizes in the Test Groups are sufficient to provide the statistical power necessary to identify differences across the samples, even within strata.

The Commission notes that while the adopted Pilot will be able to provide representativeness within strata, changes since the Proposal affect the representativeness of the Test Groups as a whole. In particular, in response to commenters who called for fewer stocks to be included in the Pilot, Commission staff conducted a supplemental analysis of Test Group sizes needed to achieve statistical power. In contrast to its analysis in the Proposal, the Commission analyzed the sample sizes in each stratum rather than using the lowest power stratum to determine the ratio of test group stocks to control stocks. As a result, the ratio of test group stocks to control group stocks is lower for some strata. In other words, the Commission was able to reduce the number of securities in test groups by weighting the composition of the test groups relative to the control group more heavily toward securities in certain strata in which more data would be needed to achieve statistical power. While analyses of the Pilot that do not consider the strata may fail to provide representative results, the addition of the stratum identifier to the Exchange Lists will allow researchers in and outside the Commission to consider the results in their analyses.

The Commission believes that the inclusion of a broad sample of NMS stocks, including small and mid-capitalization stocks, ensures representative results from the Pilot. Although previous studies, as discussed above, suggest that any possible conflicts of interest are likely to be the greatest for small-capitalization securities, the Commission believes that it is important to include the Pilot to include these small and mid-capitalization stocks (including ETPs). In particular, including these securities in the Pilot will allow the results of the Pilot to inform policy choices across any subset of these securities.

Representativeness of results of the Pilot will also be promoted by the choice of the Pilot Security selection date. Rule 610T(b) and (c) contemplate that the Commission will select and announce the Pilot Securities prior to the Pilot start date. As noted in the Proposal, the Commission anticipates that it will 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 occur to the Pilot start date, the more comparable the Test Groups will be during the Pilot. Selection of securities close to the start of the Pilot also will be more likely to be representative.
include the intended universe of securities, by avoiding securities that exit between the adoption of the Rule and the start of the Pilot, while also capturing new securities that enter the market during this period. Further, to the extent that market participants would change their behavior in anticipation of the Pilot, setting the selection period close to the Pilot effective date could reduce the effect of such behavior on pre-Pilot data. The results of the Pilot will be further representative because the 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, and whether the make or take side can both impact market quality and execution quality. 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 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 IV.B.1.a.ii. 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 and rebates, reasons other than potential conflicts of interest could have impacted the changes in order routing decisions. The Commission believes that the Pilot will achieve representativeness by requiring transaction-fee changes for all U.S. equities exchanges, which will allow researchers in and outside the Commission to identify how these revisions affect order routing decisions across exchanges. As discussed above, excluding non-exchange trading centers does not forfeit the representativeness of the results to be obtained from the Pilot, as including them would expand the Pilot to dissimilarly situated trading centers whose fee models and regulatory treatment are incomparable to exchanges. Further, the Pilot will require that changes to fees or rebates are applied at the security level, which means that for any given security, the limitation on access fees or rebates is ubiquitous across all exchanges. In addition, the Pilot achieves representativeness by imposing a fee cap and a prohibition on rebates and Linked Pricing. The existing literature suggests that the potential distortive effects arising from access fees could induce behavior that would be different from the distortions arising from rebates or Linked Pricing. Therefore, the inclusion of caps on both 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 fees or rebates.

The Commission further believes that the duration of the Pilot will produce sufficiently representative results. If broker-dealers incorporate transaction fees and rebates into their order routing decisions, a two-year duration for the Pilot, with an automatic sunset at the end of the first year, unless the Commission publishes a notice determining that the 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 Pilot. Specifically, as discussed below, the Commission recognizes that broker-dealers will incur costs to incorporate new fee schedules that are consistent with the 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 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 Pilot will also impose costs on broker-dealers, and these costs increase with the duration of the Pilot. The Commission believes that the Pilot duration, even with a one-year sunset, is long enough to produce representative results because, as discussed below in Section IV.C.2.b.ii, broker-dealers that incorporate transaction-based fees and rebates into their routing decisions will find it economically worthwhile to adapt their behavior in response to the Pilot. Further, the provision to suspend the automatic sunset facilitates representative results because it provides the Commission with flexibility as the data from the 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 Pilot to determine whether to allow the sunset to occur.

Some commenters disagreed that one year will be sufficient to achieve a representative sample. One commenter said that "robust data . . . should take two years" and that "technological changes to routing and algorithmic logic for some firms are a hurdle that could require significant time to implement." Another commenter noted the "complexities of the pilot and the opportunities for significant market evolutions." The Commission notes that it will consider these and other concerns, as noted above, in deciding whether or not to suspend the automatic sunset.

The Commission believes that the Pilot will produce representative results despite the Pilot’s treatment of stocks cross-listed on Canadian exchanges during the Pilot and the exclusion of stocks with average daily volume of less than 30,000 shares. A supplemental staff analysis found that the exclusion of the interlisted Canadian stocks from the selection of securities for test group inclusion would not materially impact the representativeness of the remaining samples. Second, the exclusion of securities with average trading volume of less than $30,000 shares per day should not materially affect the representativeness of the results because the trading in these stocks generates less than $100 per day in fees or rebates. Additionally, low trading volume stocks tend to have wider spreads rendering a rebate of $.0030 a significantly smaller incentive relative to the size of the spread than it would be for higher volume tighter spread securities. Because of these two factors, the Commission believes fees and rebates are economically much less meaningful inducements to provide liquidity for these stocks. Because of the diminished economic significance of rebates in

See e.g., Babelfish Letter at 3 and Healthy Markets Letter at 19.

Specifically, the supplemental analysis compared the distributional characteristics of all US listed stocks to the distributional characteristics of the subset of US listed stocks that excludes Canadian interlisted stocks to determine whether distributional characteristics of the subset differs statistically significantly from the distributional characteristics of all US listed stocks. The analysis finds that the distribution of the subset that excludes Canadian interlisted securities is statistically similar to the distribution of all US listed stocks.

See, e.g., Joint Asset Managers Letter at 2. Other commenters agreed that the Pilot duration will be sufficient but for other reasons. See, e.g., Fidelity Letter at 9 and CFA Letter at 6.

See, e.g., Citic Letter, at 5 and Larry Harris Letter, at 11. Also see infra Section IV.C.1.b.ii for a discussion of the costs broker-dealers could incur during the Pilot.

See, e.g., Larry Harris Letter, at 9.
these extremely low volume stocks, the Commission believes that there is a lower risk of applying a suboptimal transaction-based fee regulatory regime in these stocks. In other words, because rebates are economically less meaningful for these securities the benefits of the Pilot in informing policy decisions regarding transaction-based fees in these securities are likely low. In addition, the supplemental staff analysis found that excluding these securities increased the potential statistical power of the Pilot.

Some commenters suggested that the exclusion of ATSs from the data gathering hinders the representativeness of the data obtained from the Pilot. The Commission understands that ATSs often negotiate bespoke agreements with individual subscribers for a bundle of services for which rebates may or may not play a significant role. Even if the Commission obtained detailed information on all of these agreements, it may not be possible to identify the fees or rebates they pay for order flow from the fees for the other bundled services the ATS offers the subscriber in a manner sufficient for inclusion in the Exchange Transaction Fee Data. Also, as discussed in section IV.D.2.a it is unknown whether the Pilot will lead to exchanges to be in an improved or diminished competitive position with ATSs. Further, without including ATSs in the Pilot, ample public data exists to assess the market share of ATSs relative to exchange market share to observe and measure off-exchange order flow changes.

(2) Expansion of Readily Available Data

The Commission also expects the Pilot to provide data that would otherwise require lengthy and labor-intensive collection. Having a representative source of data is critical for the production of research and analyses about the impact of transaction-based fees on potential distortions. If more data becomes available, that data will assist the Commission in analyzing potential conflicts of interest.

The Commission believes that the data produced by the Pilot will improve upon existing data, and as discussed in more detail below. The ready availability of the Exchange Transaction Fee Summaries will facilitate the study of distortions and the equilibrium level of fees and rebates by reducing the cumbersome nature of collecting fee data. Further, the Pilot will make information on order routing decisions available to the Commission on a more granular level than current readily available data and will improve the feasibility of Commission staff analysis of order routing data during the Pilot.

The Pilot will enable Commission staff to gain improved access to order routing data and will provide access to fee data in a simplified and standardized form, which will improve the quality of the analyses produced as a result of the Pilot. Although certain order routing data and exchange fee schedules are publicly available through a combination of Rule 606 disclosures and exchange websites, respectively, the Pilot will resolve a number of limitations associated with using currently available data to study the effect of transaction-based fees on potential conflicts of interest and their impact on market quality and execution quality.

The order routing data that Commission staff will obtain as a result of the Pilot will provide superior information to that readily available today. Data will be available for a representative sample of NMS stocks, across all broker-dealers, and exchanges, at the daily frequency, which will provide sufficient data for analyses, while providing more statistical power than the Rule 606(a) public reports can provide. Relative to the data that some studies have acquired from broker-dealers and exchanges, the order routing data will also allow Commission staff to observe a time series of order routing data across broker-dealers and exchanges. Further, more granular order routing data (e.g., daily order routing statistics that separate principal and agency trading as well as auction, post only, and other orders) that than that available publicly will facilitate more targeted analysis. Together, these characteristics of the data will facilitate Commission staff research on issues such as potential conflicts of interest, which will improve the quality of the information available to the Commission for policy decisions.

The following discussion illustrates how the data obtained from the Pilot could be used to study the Commission’s objectives. The key components in the order routing data that facilitate studies of the impact of transaction-based fees and rebates on order routing and execution quality are daily volume information at the exchange, stock, and broker-dealer level, the separation of liquidity taking and liquidity making orders, the Order Capacity, the Order Designation, the time to execution for liquidity-providing orders, and the ability to estimate fill rates. The routing volume allows Commission researchers to measure how much volume each broker-dealer sends to each exchange each day in individual securities, which can be combined with the Pilot Securities Exchange List and the Exchange Transaction Fee Summary to observe patterns in routing and correlate those patterns with fees and Test or Control Group membership. The exchange level is required to match the order routing data with the fee data; the broker level is required to allow for different routing strategies across broker-dealers; and the daily level in the data facilitates statistical power. The separation of liquidity taking and liquidity making orders allows researchers to match the order routing volume to the potential fee or rebates in the Exchange Transaction Fee Summary. Order Capacity allows Commission researchers to compare order routing and execution quality statistics for Agency Orders to Principal Orders, which are less subject to conflicts of interest concerns than Agency Orders and, thus, provides an added means of obtaining causal identification. Order Designation allows researchers to exclude auction orders and to separately analyze Post Only orders because these orders types are subject to different fee structures (auction orders do not get rebates) or exist for the purpose of capturing rebates (Post Only). Excluding or separately analyzing these orders types provides for cleaner tests that are better able to measure the impacts consistent with the objectives of the Pilot. Finally, the time to execution and ability to estimate fill rates (using orders received, executed, canceled or rerouted)
provides Commission researchers with
exchange-quality information not
readily available for liquidity providing
or liquidity taking orders.\footnote{The
Commission recognizes that many trade-
based execution quality statistics are readily
estimated from publicly available data. See Section
IV.E.5 infra for a discussion of an alternative to
require order-based execution quality statistics
during the Pilot.}

An additional requirement of the Pilot is
that the exchanges will be required to
provide a standardized dataset of fees,
the Exchange Transaction Fee Summary,
the to the public. In particular,
this information will allow researchers
in and outside the Commission to create
proxies for which exchanges are likely
to offer the highest rebates. For instance,
within Test Group 1, the maximum
allowable access fee is $0.0010;
however, each exchange may have
different base and top-tier fees. Thus,
only knowing that a security is in Test
Group 1 will be incomplete information
about the impact of transaction-based
fees and rebates. Moreover, the
Exchanges will construct Exchange
Transaction Fee Summaries according
to an XML schema to be published on
the Commission’s website, and
exchanges will update this information
monthly.\footnote{The standardized fee data, as would be
required by the proposed Pilot, is discussed supra
Section III.E.2.} These data will be
standardized and consistently
formatted, which will ease the use of
these data for researchers in and outside
the Commission, as each exchange will
have to report the Base, Top Tier,
average and median fees, as detailed
above in Section III.E. Each month,
exchanges will be required to report
realized average and median per share
fees and rebates to enable an ex post
analysis of how actual fees affected past
order routing decisions, which is not
available from any data source today.

Exchanges will construct Exchange
Transaction Fee Summaries according
to an XML schema to be published on
the Commission’s website, and
exchanges will update this information
monthly.\footnote{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 will be required to publicly post
its website downloadable files containing daily
aggregated and anonymized order routing statistics,
updated monthly. Each exchange will also be
required to provide daily on its website
downloadable files containing the List of Pilot
Securities and the Pilot Securities Change List.}

The Exchange Transaction Fee
Summary released during the Pilot will:

(1) Ease aggregation across exchanges,
which affords researchers in and outside
the Commission an opportunity to
obtain representative results; (2) replicate
across studies, which will 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. Thus, the
Commission believes that a
standardized reporting of summary data
on fees by the exchanges will facilitate
analysis of the effect of transaction-
based fees.

The rule will require that the
Exchange Transaction Fee Summary be
structured using an XML schema to be
published on the Commission’s
website.\footnote{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 will be published on
the Commission’s website and the outdated version
of the schema will be removed in order to maintain
data quality and consistency with the XML
standard. The Commission’s XML schema will also
incorporate certain validations to help ensure data
quality.} Data that are structured in a
standard format can result in lower
costs to analysts and higher quality data.

(2) \footnote{As discussed in the baseline, analysis of
causality can be accomplished through either
exogenous shocks or econometric methods, such as
instrumental variable analysis.}

An additional 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
in and outside the Commission could
immediately download the information
directly into databases and use various
software packages for viewing,
manipulation, aggregation, comparison,
and analysis. This will enhance their
ability to conduct large-scale analysis
and immediate comparison of the fee
structure across exchanges.\footnote{Other
econometric techniques, such as
instrumental variables methodology, are used when
an exogenous shock (or other controlled
experiment) cannot be established.}

The Commission believes that
the Pilot is able to facilitate the examination
of causality because the Pilot will
produce a single exogenous shock that
differentially impacts either fees or
rebates on both maker-taker and
taker-maker exchanges. Exogenous shocks,
such as those in the Pilot provide
researchers with data by which
researchers may analyze a causal
relationship between changes to
transaction-based fees and rebates and
changes to order routing decisions of
broker-dealers.\footnote{As discussed in the baseline, analysis of
causality can be accomplished through either
exogenous shocks or econometric methods, such as
instrumental variable analysis.} This Pilot facilitates
the analysis of causality through an
exogenous shock that simultaneously
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differentially affects multiple Test Groups at the same time. The simultaneity of the exogenous shock across Test Groups facilitates examinations of causality, particularly in the presence of any confounding effects. For instance, if some market-wide event were to result in deviations in order routing behavior during the Pilot, the event would likely affect stocks in each Test Group as well as the Control Group. The simultaneity allows researchers in and outside the Commission to control for the impact of the market-wide event, because the impact would likely affect the Test Groups and the Control Group similarly. For example, in the difference-in-differences test of transaction costs mentioned above, any market-wide effect would result in changes to fill rates in both the Control Group and Test Group 2. Therefore, the comparison of the changes in Test Group 2 to the changes in the Control Group subtracts the market-wide effect from the total effect, thus isolating the effect of the Pilot.

In addition, to facilitate causal analysis of data during the Pilot Period, the Commission believes that it is important to collect sufficient data during a pre-Pilot Period.\(^{716}\) The pre-Pilot data can then be compared with the data that will be produced during the Pilot Period, which will 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 ETN Pilot Securities. In turn, sufficient statistical power in tests that compare the pre-Pilot data to the Pilot data would allow all researchers to more easily use the information obtained from the Pilot to inform future regulatory consideration of exchange transaction fees and rebates and their impact on the markets. The Commission 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 ETNs.\(^{717}\)

The Commission further believes that the combination of the representative sample, data from the Pilot, and the exogenous shock will facilitate analysis by Commission staff (or institutions who receive 606(b)(3) reports from their broker-dealers) of the degree to which transaction-based fee- and rebate-motivated order routing harms order execution quality. In particular, with the exogenous shock, the Order Routing Data, the Exchange Transaction Fee Summaries, and publicly available data, researchers at the Commission can identify both the degree to which transaction fees and rebates impact order routing and, the impact of transaction fee- and rebate-motivated order routing impacts execution quality.

Several commenters seemed to state that the Pilot would produce flawed causal results because the Pilot does not include all forms of remuneration.\(^{718}\) While the Commission acknowledges that other forms of remuneration may impact routing decisions, the results will still be informative. Even if some order flow migrates between exchanges and off-exchange venues, Commission staff should still be able to identify the impact of exchange fees and rebates on exchange routing.

The Pilot Securities Exchange List and the Pilot Securities Change List further enhance the ability for researchers both inside and outside of the Commission to analyze the effects of transaction-based fees on order routing decisions. By requiring daily updates to the Pilot Securities Change List, the Pilot will 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 will 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.

### 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 Pilot. This section discusses, in greater detail below, issues associated with pilots in general and the potential concerns with resultant research and analyses.

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.\(^{719}\) The Commission believes, however, that the value of the information obtained from the Pilot is not dependent upon having variation in market conditions over time, and that the duration of the Pilot will provide sufficient information to inform policy decisions.

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.\(^{720}\) In the context of this pilot, broker-dealers could choose to retain their current order-routing decisions for the duration of the Pilot, which could be costly to such broker-dealers.\(^{721}\) 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 Pilot against the costs of adjusting the algorithms for their smart order routing systems. Alternatively, broker-dealers could substantially change their business model in order to

\(^{716}\) See Healthy Markets Letter I, at 19.

\(^{717}\) See supra. Section II.D.3.

\(^{718}\) See, e.g., Coke 15–16; NYSE at 9–10; Nasdaq I at 7; RBC Letter I, at 4; ProAssurance at 2.

\(^{719}\) For instance, a pilot could be designed where the information obtained from the 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 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.

\(^{720}\) For example, one study provided evidence suggesting that trading behavior may not have completely adjusted to the Regulation SHO pilot. See, e.g., Brent Brenner, Brad Jones, & Xiaoyan Zhang, Unshackling Short Sellers: The Repeal of the Uptick Rule, Colum. U. (2008), https://www.gsb.columbia.edu/mgsgb/faculty/research/publications/3231/uptickRepeal.pdf. As a result of 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 (Aug. 6, 2004) (hereinafter “Regulation SHO”).

\(^{721}\) If broker-dealers have smart order routing systems that use algorithms that maximize rebate capture, as suggested in the Battle of Equity Market Study, supra note 530, 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 (e.g., based on execution quality) and are not driven by potential conflicts of interest (e.g., maximizing rebates), then for at least some broker-dealers, their order routing decision process may be unchanged. It is also possible that for broker-dealers with algorithms that dynamically route based upon real-time market metrics, including liquidity metrics, expected fill rates, and current queue length, routing logic may not change, however, routing choices may dynamically adjust based upon changes in those variables that result from altered fee schedules that broker-dealers may implement in conjunction with the Pilot.
avoid the Pilot.\textsuperscript{722} In addition, the Commission recognizes that the anticipated analysis of order routing data from the Pilot could cause broker-dealers to improve execution quality. This could reflect the "Hawthorne effect," which refers to the idea that people will often improve their behavior if they believe that they are observed. These outcomes could lead to results that would not represent the effects of a permanent rule change. If that were to occur, a few commenters suggested that this could lead the potential benefits of the Pilot to not justify the costs or risks that the pilot imposes.\textsuperscript{723}

The Commission believes that the Pilot is designed to obtain empirical information about how fees and rebates affect order routing decisions because the size and length of the Pilot render it unlikely that broker-dealers that currently focus their routing on rebates would maintain existing order routing decisions or alter their business models to avoid the Pilot as suggested by some commenters. In particular, the Commission believes that the Pilot duration is likely to make it economically worthwhile for broker-dealers to adjust their order routing behavior. 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, discussed below in Section IV.C.2.b.ii do not.

In addition, the potential compromise of the data due to the Hawthorne effect is limited by at least two factors. First, this is not the Commission's first pilot study. Market participants are relatively accustomed to the Commission collecting data for analysis. Second, the analysis of pre-Pilot data will allow for a baseline observation of unaffected broker-dealer order routing activity. If broker-dealers do not act on conflicts of interest during the baseline period, the Hawthorne effect is irrelevant unless it causes that good baseline behavior.\textsuperscript{724} If, on the other hand, broker-dealers do act on conflicts of interest during the baseline and the Hawthorne effect results in good behavior during the Pilot, the Pilot should facilitate the measurement of the conflicts. As a result, the Commission believes that the Pilot will produce useful data despite the possible influence of the Hawthorne effect.

The Commission recognizes that not all objectives of the Pilot would be straightforward to study. For example, the changes in fees or rebates imposed by the Pilot may change transaction costs in a way that results in changes to order routing decisions by broker-dealers, even absent potential conflicts of interest. Researchers have released order routing changes during the Pilot, without jointly studying why it changes, would not be sufficient to understand any possible conflicts of interest. Researchers can carefully study the data 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 Pilot.

Another limitation on the benefits from the Pilot is that the Pilot will not require that the order routing data be released to the public. As a result, fewer independent analyses of the Pilot's order routing datasets are likely to be performed, compared to the analysis that might have been obtained if the data were publicly released. However, the Commission believes that sufficient analysis will be produced to yield credible and reliable results without public dissemination of the order routing data. In addition, institutions, including broker dealers, asset managers, and transaction cost analysis (TCA) providers, may produce their own analyses using proprietary data and information. To the extent that interested parties prepare their own analyses, they may submit them to tradingandmarkets@sec.gov with the words "Transaction Fee Pilot Analysis" in the subject line, and the Commission will post those reports on its public website.\textsuperscript{725}

Additionally, only NMS stocks with prices of at least $2 prior to the start of the Pilot are eligible for inclusion in the Pilot. One commenter suggested that NMS stocks with prices between $1 and $2 also be included in the Pilot, as the commenter believed that the impact of fees and rebates are likely to be greatest for these securities.\textsuperscript{726} The Commission agrees with the commenter who stated that the initial Test and Control Groups in the Pilot would be more representative if they contained securities with prices below $2. However, excluding securities with prices below $2 helps to keep the sample of stocks more stable across the Pilot. This occurs because if a stock's price falls below $1 it is subject to different regulations, such as a different tick size, and thus would be excluded from the Pilot. By excluding stocks below $2 the Pilot mitigates the risk that the representativeness of the sample may diminish over time as Pilot stocks are removed due to their stock prices falling below $1. The Commission believes that the data obtained from the Pilot will be sufficient to obtain data on the effects to changes in fees and rebates on small, low-priced securities (those with prices close to $2, or any Pilot security that drops below $2 per share, but exceeds $1 per share, after the start of the Pilot).

b. Other Benefits of the Transaction Fee Pilot

Other benefits may emerge that could affect markets and market participants for the duration of the Pilot, such as potentially reduced conflicts of interest for some Test Groups, lower all-in costs of trading, or improved market quality. The Commission believes that many of the benefits discussed below will be temporary in nature and affect markets and market participants only for the duration of the Pilot. Because the Commission lacks information on the extent to which the impact of exchange fee-and-rebate pricing models affect investors,\textsuperscript{727} the Commission is unable to quantify many of the temporary benefits of the Pilot discussed below.

Some commenters stated their belief that the Pilot would not help investors and issuers.\textsuperscript{728} As discussed in Sections IV.C.2.b and IV.D.1 the Commission acknowledges that the Pilot could harm execution quality and/or market quality, but the impacts of the Pilot are uncertain. The Pilot could also improve execution quality and/or market quality for the reasons explained in those same sections. For example, as discussed in detail below,\textsuperscript{729} the Commission is uncertain about whether, or among which securities, the Pilot will result in increases or decreases in quoted spreads and investor transaction costs. A decrease in quoted spreads and/or investor transaction costs during the Pilot in some or all stocks in test groups would benefit investors. Likewise, the Commission is uncertain about how the Pilot will affect price efficiency—the

\textsuperscript{722} 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.

\textsuperscript{723} See, e.g., FIA Letter, at 3; Citadel Letter, at 4.

\textsuperscript{724} The Commission does not believe that the Hawthorne effect will cause "good" behavior in the baseline because broker-dealers would need to implement system changes similar to those described in Section IV.B.2.c prior to the pre-Pilot.

\textsuperscript{725} See supra Section IV.A.1 (Market Failure at the Broker Dealer Level) and Section IV.A.2 (Market Failure at the Exchange Level).

\textsuperscript{726} See, e.g., Nasdaq, at 1.

\textsuperscript{727} See infra Section IV.C.2.b.iv
Pilot could plausibly improve or degrade price efficiency in certain test group stocks. Any improvements would benefit issuers and investors. The Commission believes that another temporary benefit of the rule will be that the Pilot could prevent some traders from indirectly quoting in sub-pennies. 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 exchange fees and rebates to effectively undercut quotations by sub-pennies is particularly severe in ticker-maker markets. The 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 this issue.

2. Costs of the Pilot

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

a. Exchange Compliance Costs of the Pilot

The Pilot will impose costs on exchanges to comply with the Pilot’s requirements to collect, calculate, and publicly post data certain required by the Pilot on their websites, transmit the order routing data sets to the Commission, as well as to implement fee changes, if required in order to comply with the Pilot’s restrictions. Table 4 provides a summary of the costs discussed in this section.

**Table 4—Summary of Compliance Costs for Exchanges**

<table>
<thead>
<tr>
<th>Exchange type</th>
<th>Pilot securities exchange list</th>
<th>Exchange transaction fee summary</th>
<th>Order routing data</th>
<th>Fee filings</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Listing</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>Listing</td>
</tr>
<tr>
<td>Per exchange</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>15,400</td>
<td>26,100</td>
<td>24,000</td>
<td>96,800</td>
<td>162,000</td>
</tr>
<tr>
<td>Periodic:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>—2 yr Pilot</td>
<td>83,500</td>
<td>55,000</td>
<td>103,800</td>
<td>148,400</td>
<td>391,000</td>
</tr>
<tr>
<td>—1 yr Pilot</td>
<td>50,100</td>
<td>36,800</td>
<td>69,200</td>
<td>74,200</td>
<td>230,000</td>
</tr>
<tr>
<td>Total (implementation + periodic):</td>
<td>98,900</td>
<td>81,000</td>
<td>127,800</td>
<td>245,200</td>
<td>553,000</td>
</tr>
<tr>
<td>—2 yr Pilot</td>
<td>65,500</td>
<td>62,700</td>
<td>93,200</td>
<td>171,000</td>
<td>392,000</td>
</tr>
<tr>
<td>—1 yr Pilot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total across exchanges</td>
<td>92,000</td>
<td>339,000</td>
<td>311,000</td>
<td>1,258,000</td>
<td>2,001,000</td>
</tr>
<tr>
<td>Periodic:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>—2 yr Pilot</td>
<td>501,000</td>
<td>714,000</td>
<td>1,350,000</td>
<td>1,929,000</td>
<td>4,494,000</td>
</tr>
<tr>
<td>—1 yr Pilot</td>
<td>301,000</td>
<td>476,000</td>
<td>900,000</td>
<td>964,000</td>
<td>2,641,000</td>
</tr>
<tr>
<td>Total (implementation + periodic):</td>
<td>593,000</td>
<td>1,054,000</td>
<td>1,661,000</td>
<td>3,187,000</td>
<td>6,485,000</td>
</tr>
<tr>
<td>—2 yr Pilot</td>
<td>593,000</td>
<td>815,000</td>
<td>1,211,000</td>
<td>2,223,000</td>
<td>4,642,000</td>
</tr>
<tr>
<td>—1 yr Pilot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total across exchanges</td>
<td>92,000</td>
<td>339,000</td>
<td>311,000</td>
<td>1,258,000</td>
<td>2,001,000</td>
</tr>
</tbody>
</table>

i. Updating the Pilot Securities Exchange List and Pilot Securities Change List

During the Pilot, the primary listing exchanges will 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. Further, each primary listing exchange will publicly post on its website the updated Pilot Securities Change List prior to the start of each trading day, which will list, separately, changes to applicable Pilot Securities. Additional details of what will be included in each list are provided in Section II.E.1.

Upon the initial publication of the List of Pilot Securities by notice by the Commission, the primary listing exchanges will need to determine which of those securities are listed on their market, and then compile a list of those securities and publicly post on their websites that list as a downloadable file in pipe-delimited ASCII format. The Commission initially estimated that the costs associated with the initial compilation of the Pilot Securities Exchange List would cost $2,060 per exchange based on an estimated burden of 8 hours. However, one commenter stated that it "anticipates it could take as many as 44 hours" to compile the initial Pilot Securities Exchange List. The commenter stated that its estimates of the costs associated with the Pilot are based on its "prior experience implementing the Tick Size Pilot." In light of this comment, the Commission is increasing its estimate.

Accordingly, the Commission estimates that each primary listing exchange would incur, on average, a one-time
burden of approximately 44 burden hours per primary listing exchange to compile and publicly post their initial Pilot Securities Exchange List. Consequently, the Commission now estimates a cost of approximately $11,700 per listing exchange to compile the initial list of securities. 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. 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 List, these systems would have to be adapted to conform to the requirements of the Pilot. The Commission estimates that it would cost each primary listing exchange approximately $270 to develop appropriate systems for the Pilot, or about $22,300 in aggregate across the six U.S. primary listing exchanges. Once these systems are established, the Commission estimates that it would cost each listing exchange approximately $83,500 for the entire duration of the Pilot, or approximately $501,000 across the six primarily listing exchanges, 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 Pilot shall automatically sunset at the end of the first year, the Commission estimates that the costs to each exchange would be $50,100 for a one-year Pilot duration and the six-month post-Pilot Period, or approximately $301,000 across the six primarily listing exchanges. In sum, the Commission estimates a total cost for each listing exchange of approximately $98,900, or $593,000 in aggregate across exchanges, to comply with the requirement to update and post on its website at the beginning of each trading day the list of its listed securities in each of the Test Groups. This includes an estimated $15,400 in one-time implementation costs and $83,500 in ongoing costs. This estimate is based on one provided by a commenter who, based on their experience with the Tick Size Pilot, estimated that it would take up to 44 hours to compile. Accordingly, the Commission continues to believe its burden estimates are reasonable.

iii. 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, which are downloadable files containing the initial Exchange Transaction Fee Summary, using an XML schema to be published on the Commission’s website. Concurrent with the submission of the Form 19b-4 fee filings to the Commission at the outset of the Transaction Fee Pilot, the exchanges would also be required to publicly post on their websites downloadable files containing the initial Exchange Transaction Fee Summary. This includes a requirement that each exchange compute the monthly average and median realized per share fees and rebates, as detailed in Section I.E.2. These data will provide the Commission and the public with 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 believes that the costs of the exchanges would need to provide the Pilot Securities Exchange List and the Pilot Securities Change Lists would be up to 630 business days (504 business days for the two-year Pilot horizon [252 business days per year 2 years], and up to 126 business days for the six-month post-Pilot Period). The cost estimate for providing these lists for the entire period is based on the following: (Compliance Manager (2 hours x $298) + Programmer Analyst (0.25 hour x 630 trading days) + $232) = $38,475 = $38,500, or $38,475 x 6 exchanges = $230,500 = $230,000, in aggregate. The burden hours are obtained from supra Section III.D.1. One commenter provided an estimate of 300.5 burden hours for providing these lists, but the Commission continues to believe its own higher burden estimates are reasonable. See Section III.D.6, supra. If the 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 378 business days (252 business days for the one-year Pilot horizon, and 126 business days for the six-month post-Pilot Period). The cost estimate for providing these Lists for the entire period is based on the following: (Compliance Manager (0.25 hour x 378 trading days) + $232) + Programmer Analyst (0.25 hour x 378 trading days) + $232) = $50,085 = $50,100, or $50,085 x 6 exchanges = $300,510 = $301,000, in aggregate. The burden hours are obtained from supra Section III.D.1.

The rule would also require that exchanges compute the monthly average and median realized per share fees and rebates, as detailed in Section I.E.2. This estimate is based on the following: (Programmer Analyst (1 hours x $232) + $530 per exchange, or $330 x 13 U.S. equities exchanges = $8,990 = 7,000 in aggregate. The burden hours are obtained from supra Section III.D.2.

The estimated cost is based on the following: (Compliance Manager (2 hours x $298) = $530, or $530 x 13 equities exchanges = $6,890 = 7,000 in aggregate. The burden hours are obtained from supra Section III.D.2.

This estimate is based on the following: (Compliance Manager (4 hours x $401) + (Programmer Analyst (4 hours x $298) + (Programmer Analyst (4 hours x $298) + (Programmer Analyst (20 hours x $232) + (Programmer Analyst (20 hours x $232) + (Compliance Manager (0.25 hour x 630 trading days) + $232) = $38,475 = $38,500, or $38,475 x 6 exchanges = $230,500 = $230,000, in aggregate. The burden hours are obtained from supra Section III.D.1.

If the Pilot were to automatically sunset at the end of the first year, the total number of days that
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 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 approximately $12,000 annually, or $155,000, in aggregate, per year, to ensure that the system technology is up to date and remains in compliance with the rule. The burden hours are obtained from pilot period if the Commission determines that an extension of up to an additional year was needed, this would decrease the total number of updates to the Exchange Transaction Fee Summary to 24. 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 $169,000 among the 13 exchanges over the pilot duration, including pre- and post-periods. If the 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 would be a small fraction of the costs associated with the initial allocation of fees required at the outset of the Pilot. As discussed in Section II, the rule will 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.

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 I.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 the Commission determined that the Pilot should continue for up to a second year and not automatically sunset at the end of the first year, each exchange would have total costs of updates to the Exchange Transaction Fee Summary of approximately $19,080 x 13 exchanges, or $248,000 among the 13 exchanges over the pilot duration, including pre- and post-periods. If the 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. 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 $169,000 among the 13 exchanges over the pilot duration, including pre- and post-periods.

As detailed above, the Commission estimates that the costs associated only by 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 Pilot.

As discussed in Section II, the rule will 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 extension of up to an additional year was needed (24), and the post-pilot period (6), for a total number of 36 updates.

This estimate is based on the following:

[(Compliance Manager (1 hours) x $298) + (Programmer Analyst (1 hours) x $232)] = $530 per exchange, or $6,500 in aggregate across the 13 exchanges.

For all updates to structuring, the Commission 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 and FpML to exchange information on highly structured financial instruments and related market data.

The Commission anticipates that implementation of the 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 Pilot within the exchange source systems; mapping the relevant fields in the exchanges’ data source systems to the Commission’s XML schema; implementing, testing and executing the validation rules; and developing the website posting processes as required by the rule.

The initial costs to exchanges of complying with the Commission’s 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. $500 per exchange, or $6,500 in aggregate across the 13 exchanges.

This estimate is based on the following, which reflects the Commission’s experience with and burden estimates for SRO systems changes:

[(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.

This estimate is based on the following, which reflects the Commission’s experience with and burden estimates for SRO systems changes:

[(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.

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 (Nasdex, 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 for the NYSE, www.nyuex.com, Nasdaq, www.nasdaqomx.com, and Cboe, www.cboe.com, 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 formats information available on their publicly available websites.

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 Section III.D.2.

This estimate is based on the following, which reflects the Commission’s experience with and burden estimates for SRO systems changes:

[(Compliance Manager (1 hours) x $298) + (Programmer Analyst (1 hours) x $232)] = $530 per exchange, or $530 x 13 exchanges = $6,500 in aggregate.
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.

In sum, the Commission estimates the total cost of the pilot associated with producing the exchange transaction fee summary in XML format to be approximately $61,000 per exchange if the Pilot runs for two years, or $62,700 per exchange if the Pilot runs for the entire two years, and $81,150 if the Pilot were to use existing systems to collect the required order routing data.

The Commission believes that as long as the CAT Phase 1 data are available at the implementation of the Pilot, the exchanges would be able to use that data to construct the order routing data required by the 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.

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 monthly order routing data to be transmitted to the Commission.

The Commission estimates that each exchange would have a one-time cost of approximately $23,900, or approximately $311,000 in aggregate across the 13 exchanges, associated with the development and implementation of systems needed to aggregate the order routing information, as well as store the data, in the pipe-delimited ASCII form specified by the rule and as detailed in Rule 610T(d).759 The Commission anticipates that it will cost each exchange an additional $12,000 per year, or approximately $156,000 per exchange per year, to ensure that the system and storage technology is up to date and remains in compliance with the rule.760

The rule will require that exchanges produce monthly updates of the order routing data, and transmit them to the Commission in pipe-delimited ASCII format by the end of the month, as detailed in Section II.E.3 and Rule 610T(d). The Commission estimates that the transmittal and updates of the order routing datasets would cost $1,888 each month. This will require each exchange to make a total of 36 updates to the order routing data from the pre-Pilot Period through the post-Pilot Period (if the core Pilot lasts for a full two years). Each exchange would have recurring costs of updates to the order routing data of approximately $68,000 per exchange, or $884,000 among the 13 exchanges over the entire duration of the Pilot, and the pre-Pilot and post-Pilot periods.761 If the Commission were to allow the 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 24.762 Under the automatic sunset, each exchange would have recurring costs of updates to the order routing data of approximately $45,300 per exchange, or $589,000 among the 13 exchanges over a one-year Pilot, and the pre-Pilot and post-Pilot periods.763

The Commission estimates that exchanges would have initial systems burden hours of 80 hours, an additional annual burden of 40 hours to update and maintain those systems, plus 84 burden hours per year to produce and publicly post order routing data monthly.764 In sum the Commission estimates the costs of producing the order routing data to include a one-time cost of approximately $23,900 per exchange to set up the data gathering process, $12,000 per year to maintain the data gathering systems, and $1,888 per

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759 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) = $23,920 x 13 exchanges = $45,300. The burden hours are obtained from supra Section III.D.3.] 760
761 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) = $11,960 x 13 exchanges = $156,000 in aggregate. The burden hours are obtained from supra Section III.D.3.]
762 This estimate is based on the following, which reflects the Commission's experience with and burden estimates for SRO systems changes:
[(Compliance Manager (4 hours) x $298) + (Programmer Analyst (3 hours) x $232) = $1,888 per exchange, or $1,888 x 24 fee changes per exchange = $45,312 + $45,300. The burden hours are obtained from supra Section III.D.3.]
763 This estimate is based on the following, which reflects the Commission's experience with and burden estimates for SRO systems changes:
[(Compliance Manager (4 hours) x $298) + (Programmer Analyst (3 hours) x $232) = $1,888 per exchange, or $1,888 x 24 fee changes per exchange = $45,312 + $45,300. The burden hours are obtained from supra Section III.D.3.]
764 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) = $23,920 x 13 exchanges = $45,300. The burden hours are obtained from supra Section III.D.3.] 765
765 However, it is unclear exactly how the commenter aggregated the data in the Proposing Release to arrive at 160 hours because they did not provide details of their calculation.
766 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) = $23,920 x 13 exchanges = $45,300. The burden hours are obtained from supra Section III.D.3.]
month to publish the data. Specifically, the Commission estimates initial one-time implementation costs of approximately $23,900 and ongoing costs of approximately $103,800 per exchange if the Pilot lasts two years or $69,200 if the Pilot lasts one year. These costs total approximately $127,800 per exchange if the Pilot lasts two years—or approximately $1,661,000 in aggregate. These costs decline to approximately $93,200 per exchange—or $1,211,000 in aggregate—if the Pilot sunsets after one year.

v. Fee-Related Costs to Exchanges

When exchanges alter their fees they are required to submit a Form 19b-4 filing with the Commission. Consequently, the Commission expects that the pilot may increase the complexity of these filings. This section provides estimates for the costs associated with the submission of 19b-4 Forms by the exchanges during the Pilot.

At the outset of the Pilot, each equities exchange if their fees do not at that time comply with the Pilot’s pricing restrictions, would need to file with the Commission a comprehensive Form 19b-4 fee filing reflecting all of the applicable fees and rebates applicable to each of the Pilot Groups, as well as the Control Group—to reflect the temporary changes to transaction-based fees and rebates as a result of the Pilot. The Commission anticipates that exchanges will incur costs associated with and devote time to optimally assign fees and rebates across Test Groups, within the parameters allowed by the 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 $629,100 in aggregate.\(^7\) The Commission further anticipates that exchanges would bear similar costs upon the completion of the Pilot to prepare Form 19b-4 fee filings for filing with the Commission to reflect changes in fees at the conclusion of the Pilot, should they wish to change their fees or revert to their former pricing models after the Pilot concludes.

In addition to the initial production of the Form 19b-4 fee filing at the outset of the Pilot, exchanges may also choose to make periodic updates to their fee and rebate schedules, and file Form 19b-4 fee filings to effectuate those changes and thereby 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 Pilot, exchanges may revise their fee schedules more or less often during the Pilot, the 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 Pilot and has no basis to expect a decrease. The Commission also recognizes that as an outcome of the Pilot, the complexity of Form 19b-4 fee filings could increase if exchanges seek to impose different fees within Test Groups 1, Test Group 2, and the Control Group, thereby increasing the overall costs for exchanges to revise their fee and rebate schedules.\(^7\) As discussed above, the Pilot may require exchanges to design new fee structures to comply with the Pilot’s Test Groups, which would then translate into additional information in each Form 19b-4 fee filing submitted during the Pilot. These costs are likely to increase because the exchanges could take 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. Assuming the frequency remains constant, then the Pilot could increase the incremental costs incurred by exchanges to file the expected Form 19b-4 fee filings during the Pilot.\(^6\) The additional costs would only be relevant for Form 19b-4 fee filings that occur during the Pilot Period, and would not apply to Form 19b-4 fee 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 exchanges would incur an additional cost of $10,600 per Form 19b-4 fee filing to account for the increased complexity associated with the requirements of the Pilot, or approximately $1,929,000 for the anticipated 91 Form 19b-4 fee filings for fee and rebate revisions across the 13 U.S. equities exchanges during the two-year pilot duration.\(^7\) If the Pilot were to automatically sunset at the end of the first year, the Commission estimates that exchanges would bear costs of approximately $964,000 for the anticipated 91 Form 19b-4 fee filings for fee and rebate revisions across the 13 U.S. equities exchanges during the first year of the Pilot duration.

In sum, the Commission expects the pilot to impose on each exchange a one-time cost of $48,400 at the beginning and end of the pilot for the additional 19b-4 filings required by the pilot, as well as an ongoing cost of approximately $10,600 per additional 19b-4 filing to account for increased complexity in 19b-4 filings caused by the Pilot. If we assume that exchanges continue to file 19b-4 filings at an average rate of 7 per year and if the pilot lasts for 2 years, these incremental costs sum to approximately $148,400 per exchange—which declines to $74,200 if the pilot ends after the first year. Combining the cost of the two additional 19b-4 filings with the cost of potential increased complexity provides an estimated cost of the pilot associated with 19b-4 filings of approximately $245,200 per exchange—or $3,187,000 in aggregate—if the pilot lasts two years, or $171,000 per exchange—or $2,223,000 in aggregate—if the pilot expires after the first year.

\(^7\) The estimate is based on the following: \((\text{Attorney (8 hours) x $400}) + (\text{Compliance Attorney (40 hours) x $352}) + (\text{Assistant General Counsel (25 hours) x $449}) + (\text{Director of Compliance (15 hours) x $470}) = $48,400, or $48,395 \approx 13 \text{equities exchanges} = \$629,135 \approx \$629,100 \text{in aggregate. SeeOMB Control No. 3235-0045 (August 19, 2016), 81 FR 57946 (August 24, 2016) (Request to OMB forExtension of Rule 19b-4 and Form 19b-4 Filings).}

\(^6\) The Commission believes that the inclusion of linked pricing prohibitions for Test Group 2 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 many exchanges currently use linked pricing mechanisms and instead most rely on rebates.

\(^7\) 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 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 estimates that there will be 91 19b-4 filings (7 filings x 13 exchanges). If the Commission determines that the Pilot shall continue for a second year, the 13 exchanges could file a total of 182 19b-4 filings (91 x two-year Pilot duration).
vi. Other Costs to Exchanges

The Pilot may result in more complicated fee structures that could also affect exchange’s processing costs of tracking and calculating monthly invoices for its members during the 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 and no commenters provided such information.

b. Other Costs Associated With the Pilot

This section considers additional costs that may occur as a result of the Pilot. Specifically, this section discusses how the Pilot may impact exchanges’ fee revenue, broker-dealer compliance costs, brokerage commissions, liquidity, and issuers.

i. Loss of Exchanges’ Fee Revenue

The Commission analyzed whether exchanges could experience a change to their fee revenues associated with transaction-based fees and rebates for either of two reasons: A decline in the margin between fees and rebates, or a decline in overall trading volume on an exchange as a result of the Pilot. In the Proposing Release the Commission stated its belief that only stocks in the test group with a cap of $0.0005 (former Test Group 2) would experience narrower margins and estimated that these narrower margins could result in exchanges incurring revenue losses of up to $7,650,000 per month. With the removal of the former Test Group 2 the Commission now believes that the Pilot may not have a significant effect on Exchange revenue, at least not because of narrower margins between fees and rebates.

For stocks in Test Group 1 (the Test Group with a fee cap of $0.0010) the Commission does not believe that the Pilot will result in narrower margins earned by the exchanges because the fee cap in this group is double the current typical average net capture (i.e., margin) that exchanges earn which is approximately $0.0005.774 Consequently, the exchanges can maintain current margins by reducing the rebate offered at the same level as fees charged are reduced. For stocks in Test Group 2, the Commission also does not believe that the Pilot is likely to shrink margins. For these stocks the fee cap remains at $0.0030, while exchanges are prohibited from paying rebates and offering Linked Pricing. Consequently, the prohibition of rebates for securities in Test Group 2 would conceivably allow the exchanges to reduce fees to as low as $0.00025—if charged to both parties in a transaction—without reducing the exchange’s average net capture per trade. While less likely given competitive dynamics, if the exchanges wanted to increase their net capture, it is possible under the pilot terms for total net capture in group one to be as high as $0.002 if both sides were charged the maximum of $0.001, and in group two to be $0.003, both of which are far in excess of the average net capture that exchanges receive today. For these reasons, the Commission now expects the effects of the Pilot on exchange revenue through impacting per-trade margins to be minimal. In addition, the Commission believes that the impact on exchange revenues through changes in trading volume are difficult to determine in advance, but recognizes that the magnitude of such changes could be significant and some potential lost revenue could be in a transfer to investors or among exchanges. The Commission considered whether individual exchanges could experience a decline in trading volume for four reasons, as multiple commenters suggested: If exchanges lose volume to off-exchange venues, if volume declines because of increased transaction costs, if the Pilot reduces excessive intermediation, or if volume shifts among exchanges. The Commission recognizes that the Pilot presents a risk that the Pilot could result in less fee revenue for exchanges due to lower trading volumes. However, the Commission believes that decreased trading volume, while one possible outcome of the Pilot, is not the only reasonable outcome, and that the ex ante effect of the Pilot on trading volume is difficult to determine. First, several commenters stated that reducing or eliminating the ability for exchanges to pay rebates may cause exchanges to become less competitive relative to off-exchange venues like ATSs, which would not be so constrained. The change in Section IV.D.2.a. identifies significant uncertainty in the potential for exchanges to be less competitive relative to off-exchange venues such as ATSs, and identifies conditions in which they could actually be more competitive. Consequently, the Commission cannot determine in advance of the Pilot whether exchanges will lose volume to off-exchange venues. Second, total trading volume, and consequently exchange revenue, could decline if the Pilot increases transaction costs. A number of issuers expressed the concern via comment letters that the Pilot would lead to lower levels of trading volume because of their experience with the Tick Size Pilot. However, not all issuers felt that the Pilot would result in lower trading volumes. One issuer “welcome[d] the opportunity for [its] stock to be included in the Pilot” and did not “expect that a reduction or outright removal of rebates will have any significant or harmful effects on . . . [its] stock’s trading volume.” On the other hand, if the Pilot decreases the cost of trading on the exchanges, then the Pilot could increase trading volumes on the exchanges. This view was expressed by one commenter who stated their belief “the Pilot will reduce the costs of trading on exchanges, which may increase trading volumes on the exchanges.” Lower costs of trading, caused by the reduction in fees, might increase trading volume on exchanges for at least two reasons. First, lower trading costs may induce trades that would otherwise not have occurred by allowing investors the ability to trade on smaller increments of information. Lower trading costs may also induce the participation of new traders, such as short-term traders for whom transaction costs are of greatest concern, to transact in a given stock.
who would not otherwise participate. Consequently, if the Pilot leads to decreased trading costs, then trading volumes in those stocks may increase—increasing exchange revenue. In Section IV.C.2.b.iv below, the Commission discusses its belief that the effect of the Pilot on liquidity and transaction costs is not clear and could either increase or decrease. Given this uncertainty in the current state of liquidity, the Commission cannot determine in advance whether the Pilot will result in a reduction in liquidity that would reduce trading volume.

Third, the Pilot may decrease trading volume, and thus exchange revenues, if it results in a reduction in intermediary by market makers for two reasons, but this would be a transfer to investors. The first reason is that market makers from time to time will use marketable orders to balance inventory. If these market makers decline to participate due to reduced rebate incentives, then their marketable orders will not arrive—diminishing trading volume. The second reason decreased intermediation may lead to lower volumes is that non-market makers might begin to execute their trades via non-marketable orders. Non-market makers may submit marketable orders because of an inability to achieve high fill rates with non-marketable limit orders due to significant competition from market makers. The reduction in intermediation may result in situations where two traders with offsetting trades, who would have generated two separate trades with market makers as the counterparty instead execute their trade with each other resulting in one trade. This could occur, for example, if the Pilot reduces queue lengths for investors as discussed in Section IV.C.2.b.iv(2) below. While this effect would result in a loss in revenue to exchanges that would collect margin on a smaller number of trades, it would be a net gain for investors because executions on a smaller proportion of marketable orders would mean that the investors pay less in transaction fees and would more often capture, or earn, the spread where previously they would have paid the spread to transact.

Fourth, even if overall trading volume does not decline or shift to off-exchange venues during the Pilot, individual exchanges may experience a decline in trading volume if the Pilot leads to a change in market share among the lit exchanges. This mechanism is discussed in Section IV.D.2.a. This section also highlights the difficulties in determining the expected redistribution of market share among the existing exchanges due to potentially countervailing economic effects. To this point, one commenter noted that the loss in revenue estimated above relied on “exchanges’ existing market share percentages” which “assumes that exchanges would remain equally competitive for order flow.” 780

The Commission agrees that the Pilot may impact the level and distribution of trading volume on lit exchanges but notes that any redistribution would be a transfer among exchanges rather than an economic cost.

The Commission acknowledges that the reduction or elimination of rebates may particularly affect smaller exchanges due to the liquidity externality, especially if their primary competitive differentiation is based upon a modified fee model. As discussed in the Preproposed Release, liquidity tends to consolidate.781 Thus, the restrictions on rebates resulting from the Pilot would harm smaller exchanges that may be competing 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. It could also have longer-term effects if smaller exchanges consolidate or exit as a result of the Pilot. However, the Commission does not believe that consolidation or exit is likely during the pilot because only about a quarter of NMS stocks will be included in test groups.

The Pilot could also impact exchanges’ fee revenue after the conclusion of the Pilot if as a result of the Pilot broker-dealers permanently alter their order routing decisions after the Pilot is completed. One commenter argued that this may be the case and suggested that the Commission’s claim that the Pilot’s effect on broker-dealers’ routing decisions would be temporary “[wa]s contradicted by the Commission’s own finding that broker-dealers would not change their behavior unless the Transaction Fee Pilot lasts for at least one year.” 782 To this point, given the competitive nature of financial markets, the Commission does not expect that it would take most broker-dealers up to one year to alter their behavior. Indeed, this commenter supports this belief by stating that exchange and non-exchange trading centers vigorously compete for trading volume, and that market participants are sensitive to revisions in transaction-based pricing models.783 Given this competition, the Commission believes market participants will likely adjust their behavior quickly both upon the implementation and conclusion of the Pilot, and that the Pilot duration will incentivize broker-dealers not to “wait out” the Pilot who could be otherwise inclined to do so if the duration were not sufficiently long.784

If the Pilot results in a decline in fee revenue for exchanges, then this could lead to other costs to the by investors as a result. Exchanges could promote additional order types and may even initiate new types of markets as a result of the Pilot, which would only serve to fragment markets and add to their complexity, the costs of which could be borne by investors.785 In particular, the Commission recognizes the remote possibility that an exchange holding company could attempt to optimize its overall performance during the Pilot by further diversifying with other exchange models. The Commission believes, however, that a new equity exchange registered in direct response to the Pilot would be unlikely to become operational before the conclusion of the Pilot. In addition, the Commission believes that it is unlikely that exchanges will promote additional order types as a result of the Pilot.

In sum, the Commission believes that the costs to the exchanges due to narrower margins earned per trade are likely to be minimal—if any—due to the removal of the proposed Test Group with the fee cap of $0.0005. However, the Commission does expect that there could be a change in trading volume or a redistribution of market share among exchanges as market participants re-optimize their order routing systems as a result of the Pilot. However, due to the reasons discussed in this section, the Commission cannot determine in advance of the Pilot whether these market share/trading volume changes will increase or decrease exchange revenue. Consequently, the Commission acknowledges that the Pilot may lead to lower trading volume/market share for exchanges, which would impose a cost in terms of lost transaction fee revenue, but is unable to quantify the expected magnitude of this potential cost and no commenter provided an estimate of the amount of the lost transaction fee revenue.

While the Commission cannot determine in advance of the Pilot its impact both in terms of direction and magnitude, the Commission has attempted to estimate the costs should volume decline. Using data from Table 3 in section IV.B.2.e the Commission

780 NYSE Letter I, at 17.
781 See Proposing Release, supra note 2, at 13042.
782 See NYSE Letter I, at 15–16.
784 See Section IV.C.2.a.iii.
785 See Section III.A. See also, e.g., Fidelity Letter, at 8.
estimates an annualized upper bound on the profit earned from transaction fees for each exchange. Aggregated across all exchanges this number equals approximately $3 billion per year. However, only about 1/4th of NMS securities will be in a test group subject to the Pilot, so the Commission estimates the Pilot could affect the approximately $750 million per year across all exchanges, depending on how much volume changes. Consequently, if the Pilot were to cause a 10% reduction in trading volume on exchanges then this change could reduce fee revenue on the exchanges by approximately $150 million over two years or $75 million if the Commission were to allow the Pilot to automatically sunset at the end of the first year. However, the Commission does not believe that the 10% reduction in trading volume is a reasonable assumption because the Swan Study shows that Nasdaq lost 10% of its volume using one volume measure, it lost only 200,000 shares in another. In addition, the Swan Study finds no change in overall volume or in off-exchange volume, just a migration from Nasdaq to other exchanges. Therefore, the Commission does not believe that either the 10% volume reduction or, consequently, the estimate of $150 million revenue reduction is reasonable.

ii. Broker-Dealer Systems Costs

Although the costs of compliance with the Pilot will primarily affect the exchanges, broker-dealers and other market participants are also likely to incur costs as a result of the Pilot. Commenters provided mixed information on the magnitude of these costs. Some commented that costs to broker-dealers of the Pilot would be substantial, while other commenters stated that the costs for broker-dealers associated with the Pilot would not be significant or expensive because exchange fee schedules change regularly and broker-dealers are used to adapting their order routing algorithms to new and changed fee schedules. This section provides the Commission’s estimates for broker-dealer compliance costs associated with the Pilot.

In response to the Pilot, market participants might have a one-time cost at the onset and the conclusion of the Pilot to adjust their systems to reflect the shocks and potential additional complexity of transaction-based fees. In addition, there may be additional modifications to routing strategies that are made in subsequent months to adjust to changing liquidity dynamics as behavior changes associated with the pilot settle. Broker-dealer systems need to be coded into the smart order router (SOR) algorithms to route orders based on certain criteria, such as fill rates, time to execution, lowest fees, or highest rebates.

One commenter agreed, stating that such systems changes "should primarily consist of modifications to the routing tables and other associated operational activities." The Commission understands that some of the associated changes and modifications may already be coded into the smart order router (SOR) algorithms such that changes to associated liquidity shifts may be dynamic and automated, i.e., in need of little additional modification. To estimate these costs, the Commission assumes (1) that all broker-dealer members of exchanges will adjust their systems for the pilot and (2) that all broker-dealer members of exchanges have automated order routing systems. While the Pilot does not directly require broker-dealers to adjust their systems, the Commission expects broker-dealers who do not update their systems may incur significant costs relative to those who do in terms of potential impacts on execution quality and in their ability to manage fees and rebates. Broker-dealers might choose to adjust their systems for the Pilot for many reasons, including to recognize that the Pilot could affect execution quality for investors and/or to better manage fees and rebates. The cost estimates assume that broker-dealers will adjust to their existing systems to capture changes in fees and rebates associated with each Test Group of securities, rather than bearing start-up costs associated with implementing new order routing systems.

In its estimates, the Commission recognizes that the costs associated with adjusting the execution algorithms by broker-dealers for the Pilot are likely to be more costly than the periodic updates that broker-dealers may make to incorporate changes to fee schedules implemented by exchanges or to fine tune their strategies. The additional expected costs may be due to changes for the Pilot are likely to require more complex programming that segments stocks into different fee regimes (assuming exchanges implement fees customized to each Test Group), rather than just altering codes or inputs. As of July 2017, exchanges have 18 fee categories and 21 rebate categories, on average. If exchanges maintain the same level of complexity in their fee schedules during the Pilot, up to a two-fold increase in the number of fee and rebate categories could occur, which would increase complexity for broker-dealers who incorporate fees into their order routing decisions.

Additionally, the Commission agrees with the commenter who stated that, to the extent that broker-dealers’ order routing algorithms are programmed to the exchange, and not the individual security, the Pilot will increase complexity by requiring an adjustment to this methodology. 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 Pilot would be approximately $9,000 per broker-dealer, or $3,573,000 in aggregate across the 397 broker-dealers that are currently members of equities exchanges.

780 See sections IV.C.1.a.iii and IV.E.5.a for additional discussion.
781 See Table 2 in Section IV.B.2.f supra.
782 In addition, the Commission recognizes the potential costs to exchanges of this complexity above in Section IV.C.2.a.
783 See Larry Harris Letter, at 10-11.
784 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) + (Programmer Analyst (10 hours) x $298) + (Senior Business Analyst (5 hours) x $265) = $9,000 per broker-dealer that is a member of at least one exchange. As of December 31, 2016,
Commission further estimates that broker-dealers would bear a similar cost to adjust their order routing systems at the conclusion of the Pilot.

Additionally, the Commission expects that broker-dealers would update their order routing systems with changes to fees or rebates submitted by exchanges through Form 19b-4 fee filings to the Commission during the Pilot. As discussed in the baseline, exchanges, on average, file changes to fees or rebates approximately seven times per year; therefore, broker-dealers are likely to have experience in updating the order routing systems to reflect these routine changes to fees and rebates.\textsuperscript{797} As in the estimates of the costs of the initial and final adjustments, broker-dealers are likely to face higher costs per update as a result of the Pilot because of the added complexity of having to update multiple modules within their order routing systems. The Commission’s estimates of these updates assume that exchanges update their fees schedules as often during the Pilot as at present. Therefore, the costs to broker-dealers associated with the Pilot are the additional costs associated with the complexity of the updates and not the total cost of the updates.\textsuperscript{798} In other words, broker-dealers would have updated their systems (or routing tables) anyway in the absence of the Pilot to reflect the same number of exchange fee and rebate changes. The Commission estimates described below reflect the additional cost of the Pilot ("additional costs"), which is how much more an update might cost during the Pilot compared to a scenario without the Pilot.

The Commission believes that the per-update additional costs associated with these changes are likely to be a small fraction of the costs associated with the initial costs of adjusting the routing systems to reflect the required fee and rebate revisions at the outset of the 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 approximately $105,000 in aggregate across the 397 broker-dealers that are members of U.S. equities exchanges.\textsuperscript{799} As shown above, the Commission 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 two-year pilot duration. Therefore, the aggregate costs of updating order routing systems would be $48,000 per broker-dealer, or $19,056,000 in total across all broker-dealers.\textsuperscript{800} If the Pilot were to automatically sunset at the end of the first year, the aggregate costs of updating order routing systems would be $24,000 per broker-dealer, or $9,528,000 in total across all broker-dealers.

In sum the Commission believes that the all in costs to broker-dealers of updating order routing systems as a result of the Pilot will average approximately $66,000 per broker-dealer to update their systems over the entire Pilot Period. If the Pilot automatically sunsets at the end of the first year, the costs associated with these updates will be approximately $42,000 per broker-dealer.\textsuperscript{801} The Commission notes that these estimates may be overstated. 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. Additionally, the exchanges could resort to more simplified fee schedules relative to the current baseline, which would reduce broker-dealers’ costs of updating their systems for the Pilot.

iii. Temporary Increase in Brokerage Commissions

Beyond the implementation and compliance costs for exchanges and broker-dealers associated with the Pilot, the changes to the exchange transaction fee and rebate structures could lead to temporary increases in brokerage commissions charged to their customers. Several studies show, and several commenters concurred, that brokerage commissions today are at historically low levels.\textsuperscript{802} Brokerage clients may have a preference for low commissions with 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 agreements or implicit agreements.\textsuperscript{803} As a result, the Pilot could lead to higher overall commissions as rebates obtained by broker-dealers fall,\textsuperscript{804} thereby temporarily reducing the overall welfare of retail brokerage clients as a result of increased commissions.\textsuperscript{805}

For instance, the elimination of rebates and Linked Pricing in Test Group 2 could result in a transfer from broker-dealers to exchanges. Assuming, as discussed above, the margin between fees and rebates is approximately $0.0002 per share,\textsuperscript{806} with transaction fees of $0.0030 per share and rebates of $0.0028 per share, Test Group 2 could result in a transfer of $0.0028 from broker-dealers to the exchanges with
respect to their passively posted non-marketable orders, particularly because exchanges would be prohibited from offering Linked Pricing mechanisms that could act as substitutes for cash rebates. The estimates of the potential increased revenue to exchanges are as follows.

Assuming that the share volume in Test Group 2 would be approximately 12.5% of the broker-dealer's share volume across all securities, using data from Table 2 in the baseline, Test Group 2 would have share volume of approximately 11.5 billion each month. 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 2, the Commission anticipates no change in revenue for exchanges, and no transfer from broker-dealers. If, instead, exchanges charged the maximum fees of $0.0030 while they are prohibited from paying rebates or Linked Pricing in Test Group 2, the Commission estimates a monthly aggregate increase in revenues across all exchanges of $32,200,000. If the volume on each exchange does not change, then the estimated annual average increase in revenues across all exchanges would be $386.4 million [$32,200,000 x 12 = $386,400,000]. The transfer of rebates from the broker-dealers to exchanges could potentially increase exchange revenue by approximately 64.1%. Moreover, these costs could likely fail 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 2.

The Commission further acknowledges that if brokerage commissions were to increase as a result of the Pilot, broker-dealers could continue to charge higher commissions even after the conclusion of the Pilot. However, due to competition among broker-dealers, including the proliferation of low-cost online broker-dealers, the Commission believes that broker-dealers would be unlikely to significantly increase brokerage commissions as a result of the Pilot.

Lastly, the Commission acknowledges that brokerage commissions may decrease during the Pilot if the Pilot results in lower execution costs for some test groups, then those lower costs may be passed on to investors in the form of lower commissions. For example, if a broker-dealer pays the transaction fee more often than they earn the rebate, the reduction of fee caps would reduce the cost of transacting for this broker-dealer, which the broker-dealer may pass onto investors in the form of lower commissions.

iv. Temporary Reduction in Liquidity

The effect of the Pilot on liquidity is uncertain as there are reasons why the Pilot may increase as well as decrease liquidity. Several commenters expressed concern that the Pilot would reduce liquidity. These commenter statements largely focus on the impact of the reduction or elimination of rebates. In considering the comments, and as analyzed in the following sections, the Commission considered the impact of the direct effect of rebates on quoted spreads, the impact of a loss of liquidity provision on quoted spreads and depth, the impact of changes in adverse selection on transaction costs, and the impact of potential conflicts of interest on execution quality. In addition, the Commission analyzed estimates of the costs of a potential reduction in liquidity provided by commenters.

The Pilot could result in a positive, negative, or neutral change in liquidity for the stocks in test groups. Adding to this uncertainty, some commenters felt that to the extent that there are liquidity effects, such effects would be minimal. Also, the impacts of the Pilot on liquidity may not be uniform across all securities and several commenters believed that widening of spreads would be limited to a small number of securities. Some commenters stated that the widening of spreads is unlikely to affect the most and least liquid securities, or will not adversely affect liquidity at all. Further, as some commenters explained, less liquid stocks tend to have wider spreads, and therefore, the impact of rebates as an incentive to provide liquidity may become less relevant for these securities.

(1) Direct Impact of Fees and Rebates on Quoted Spreads

The Commission believes the impact of the Pilot on liquidity and transaction costs through a direct adjustment of the quoted prices is uncertain. One study argues that transaction-based rebates may artificially narrow the quoted spread on make-take exchanges by the amount of the rebate. This effect would particularly impact retail investors whose orders are largely internalized at the best quoted prices. However, whether rebates can effectively narrow quoted spreads in a given stock depends on whether that stock's natural quoted spread (without artificial narrowing) is constrained by the tick size. For example, if a stock has a natural quoted spread of less than one penny, which is the minimum tick size, then rebates cannot possibly artificially narrow the quoted spread. Many of the most active stocks have average quoted spreads very close to the tick size, and the Commission believes that the natural spread in some of these stocks could be at or less than a penny. Consequently, the Commission believes that rebates might not artificially narrow quoted spreads in at least some of the most active stocks and, therefore, that the Pilot might not result in wider quoted spreads in all stocks.

(2) Potential Reduction in Liquidity Provision

The Commission recognizes that the Pilot could reduce the incentives to...
provide liquidity, but believes that the impact of this reduced incentive on quoted spreads and transaction costs could be positive or negative and could vary across securities. In particular, the Commission believes that despite a potential reduction in liquidity provision, some investors could actually experience lower or higher transaction costs in some securities for several reasons. Generally, this section provides reasons to expect an increase in transaction costs as well as reasons to expect a decrease in transaction costs. Likely, several of these effects will offset to create a new equilibrium, but the Commission cannot predict whether investors will face higher or lower transaction costs in this new equilibrium.

First, some commenters stated that the removal of rebates could cause some liquidity providers to stop providing liquidity, which would result in a temporary increase in transaction costs during the Pilot as the remaining liquidity providers would face less competition for their services and therefore could charge wider spreads to liquidity demanders.820 One Commenter suggested that this effect could be seen by comparing spreads on non-rebate exchanges like Choe EDGA with the rebate paying exchange Cboe EDGX. The Commenter noted that average spreads on Cboe EDGX tend to be lower than those on Cboe EDCA.821 However, the Commission does not believe that this data point provides robust evidence that spreads will widen across all securities because EDGA and EDGX tend to trade securities with different characteristics, consistent with another commenter who stated that “EDGA only traffics in the most liquid names” consequently comparing average spreads on EDGA and EDGX is not appropriate. Additionally, this analysis does not establish a causal link between rebates and quote quality.822

The Commission notes that a reduction in liquidity provision might not result in wider quoted spreads and greater transaction costs, particularly in more active securities. In particular, as suggested by some commenters, if rebates result in excessive intermediation,823 or if “natural” buyers and sellers set quoted prices,824 a reduction in rebates need not widen quoted spreads and increase transaction costs and could actually reduce transaction costs to the benefit of investors. Excessive intermediation makes it more difficult for non-market makers to get passive orders to the front of the queue and could induce them to cross the spread to trade aggressively a greater fraction of the time. If a reduction in rebates can result in less excessive intermediation, then a reduction in liquidity provision by market makers might not adversely impact transaction costs but could instead decrease queue lengths faced by non-market-maker liquidity providers such as institutional investors. This could allow investors trading test group stocks to potentially experience better execution quality because they could be able to obtain better queue priority on their passive orders. Better queue priority would both diminish adverse selection costs for passive orders and also decrease the fraction of time investors are required to pay the spread and potential take fee to execute a trade.825 The Commission does not have the data necessary to empirically analyze whether rebates indeed result in excessive intermediation, but expects the Pilot to facilitate such analysis.

The Commission recognizes the risk, noted by some commenters, that the Pilot could increase the cost of transacting if the reduction of rebates leads to a reduction in quoted depth.826 If the reduction in rebates in test group securities results in liquidity providers such as market makers posting less displayed liquidity, quoted depth could decline even if quoted spreads does not decline. This lower depth could result in increased costs of transacting larger quantities. These effects could be more pronounced in small stocks if, as some commenters suggest, rebates are important to induce market makers to provide liquidity in small stocks either directly or through cross subsidization of liquidity.827

The Commission also recognizes the potential for a reduction in liquidity and an increase in transaction costs for ETPs and particularly less active ETPs. Multiple commenters expressed concern that the Pilot might particularly reduce liquidity in ETPs.828 These commenters noted that, unlike in stocks, the Pilot might affect liquidity for ETPs in one of two ways: It may affect liquidity in shares of the ETF, or it may affect liquidity in the underlying assets of the ETF. The Pilot may reduce liquidity in the shares of the ETF if the reduction of or elimination of rebates induces market makers to stop or reduce providing liquidity for shares of an ETF. Moreover, another commenter expressed concern that the Pilot is inconsistent with exchanges programs for ETP market makers, whereby incentives are made available to market makers to act as liquidity providers for thinly liquid ETPs and therefore the negative impact of the Pilot could be the most pronounced among illiquid ETPs.829 Additionally, the Pilot may affect the liquidity of ETPs if it impacts the liquidity of the underlying securities. If the Pilot affects liquidity in shares of an ETF or impacts the liquidity of the ETP’s underlying securities, it will also affect the costs to authorized participants of eliminating ETP mispricing by participating in the create-redeem process.830 Additionally, the Commission recognizes that the Pilot might result in other unforeseen changes to market dynamics,831 including improved or diminished execution quality by certain trading centers which could shift the level of market participation. Also, the Pilot may affect the ability of exchanges and ATSs to draw liquidity provision through innovative methods other than rebates. The effects of these changes may have a positive, neutral, or negative effect on liquidity. Consequently, the Commission believes that there is significant uncertainty surrounding the effects of the Pilot on liquidity.

(3) Conflicts of Interest

As noted above, the Commission is not certain of the extent to which some broker-dealers route investor orders to avoid fees or to capture rebates in such

820 See also Pragma Letter, at 2; Magne Letter, at 2; STA Letter, at 3; STANY Letter, at 2; Morgan Stanley Letter, at 3-4; Energizer Letter, at 1.
821 See NYSE Letter II, at 2, 9. See also, Nasdaq Letter III, at 4-6 (presenting similar data suggesting that quote quality on make-take exchanges is better than on inverted exchanges).
822 See section IV.C.1.a.iii (3) for a discussion on causality. See also Mulson Letter II, at 1.
823 See NYSE Letter II, at 4 (noting that “some institutions believe maker-taker pricing unnecessarily subsidizes quoting in sufficiently liquid securities and encourages "intermediation" that crowds out long-term investor participation in the market.”). See also T. Rowe Price Letter, at 2.
824 See, e.g., Mulson Letter.
826 See Pragma Letter, at 2; Nasdaq Letter I, at 6.
827 See Nasdaq Letter I, at 5-9; Nasdaq Letter III, at 9. However another commenter suggested that the impact of the Pilot on small stocks would be mitigated by the fact that small stocks tend to have wider spreads, and thus rebates form a smaller fraction of total market making incentives. See Decimus Letter, at 4-5
828 See, e.g., ICI Letter I, at 4; BlackRock Letter, at 1-2; FIA Letter, at 4; SIFMA Letter, at 4; Issuer Network Letter I, at 3; Schwab Letter, at 5; Fidelity Letter, at 9; Invesco Letter, at 2; State Street Letter, at 3; Clearpool Letter, at 8; STA Letter, at 4; STANY Letter, at 4; Healthy Markets Letter I, at 11; Nasdaq Letter I, at 8; NYSE Letter I, at 7; Cboe Letter I, at 17; Credit Suisse Commentary, at 6; Morgan Stanley Letter, at 3-4.
829 See infra Section IV.D.1.
830 See IEX Letter II, at 7.
a way that reduces execution quality. To the extent they do, the Pilot could improve execution quality. This would occur if, as many commenters and studies have argued, the offering of rebates produces a conflict of interest that induces orders to be routed to exchanges with sub-optimal execution quality. Consequently, the removal or reduction of rebates may cause orders to be routed to exchanges with better execution quality and the execution quality in the stocks in the Test Groups could improve. As noted above, commenters disagreed on whether broker-dealers act on such conflicts of interest and the Commission lacks sufficient information to determine the magnitude of any such conflicts. The Commission notes that the objective of the Pilot is, in part, to study such conflicts of interest.

(4) Cost Estimates

Multiple commenters provided quantitative cost estimates associated with expected changes in liquidity. The commenters’ estimates all rely on the assumption that a reduction in rebates will increase quoted spreads and transaction costs but took different approaches, resulting in a wide range of estimates from $24 million to $4 billion per year. Overall, while the Commission appreciates the cost estimates, the Commission reiterates that the Pilot could either increase or decrease investor transaction costs for the reasons explained above. However, for the reasons discussed below, the Commission believes that each of the commenters overestimated the potential costs to investors. Below, the Commission first describes each estimate, adjusts the estimate for the change in the structure of the Pilot and then discusses how the assumptions might affect the estimation.

The first commenter estimated costs of $24 million per year. Across all proposed test groups, this commenter calculated an anticipated reduction in the average rebate of $0.002267 per share, and that approximately 50% of all liquidity providers would be affected by the rebate reduction by “updating their quotes to less aggressive prices,” leading to an increased cost to cross the spread of $0.001134 per share. Assuming only stocks with an average quoted spread in excess of $0.02 will be adversely affected by the rebate reduction, this commenter estimated that the costs to its customers of a wider quoted spread would be $24 million annually.

To account for the changes to the Pilot since the proposal, Commission staff estimate that this commenter’s approach would estimate a cost of $12.7 million per year. To arrive at this estimate, the Commission adjusted the average rebate reduction to 0.0024 to account for the change to the test groups and adjusted the average implied volume to account for the inclusion of less than half the number of stocks in test groups.

Despite these adjustments, the Commission notes that the estimate is likely imprecise. In particular, this estimate relies on an assumption that the spreads will widen by 50% of the reduction in rebates but does not provide support for this assumption. The commenter does not explain why they expect this relation between rebates and liquidity or provide an explanation for why they feel that 50% is the appropriate adjustment to use. Further, this adjustment does not allow for some liquidity demanders to supply liquidity more often if queue lengths decline with rebates. Such a switch would reduce the impact on transaction costs. The commenter also does not explain whether the share volume used to estimate the costs was all share volume in securities with average quoted spreads of less than two cents or just that portion likely to be in a test group. If the commenter included all volume, the estimates would be closer to $6.34 million.

A second commenter estimated that if effective spreads widened by 10% for the 100 top securities, “the Pilot could conservatively cost investors over $400 million more in annual execution costs.” The commenter does not provide an analysis, either quantitative or qualitative, to support their belief that a 10% increase is appropriate to use. To examine the robustness of the estimate or to adjust the estimate for the changes in the Pilot since the proposal. As such the best way for the Commission to adjust the estimate for the changes in the Pilot is to divide it by two, $200 million, because the changes reduced the number of securities in the Pilot by slightly more than half. However, because of uncertainties about methodology and assumptions, the Commission cannot adjust with any certainty the $400 million estimate and does not believe that a $200 million estimate is reliable. The Commission recognizes that the changes to the Pilot could also change the commenter’s estimate of how much spreads widen.

A third commenter provided an analysis that suggested that, due to wider spreads, the increased costs to investors would be at least $1 billion per year and potentially $4 billion. Like the first commenter, this $1 billion estimate assumes an average weighted average reduction in transaction costs based on the reduction in the rebate, except that this commenter doubled the rebate to adjust transaction costs. To compute their estimate, the commenter estimates the weighted reduction in rebates across all stocks, taking into account the fact that most stocks will see no change in rebates. The commenter then uses the expected weighted average reduction in rebates to compute their estimate for the Pilot’s impact on average spreads across all stocks. The commenter then multiplies the expected impact on spreads by total trading volume to arrive at a total of approximately $1 billion in estimated costs per year. Using the commenter’s method, the adopted rule would have an average rebate reduction of approximately $0.0004, which would widen spreads by $0.0002 to approximately half the prior increase, for a new cost estimate of $600 million per year.

Other commenters responded to this commenter’s $1 billion estimate in various ways. One commenter criticized the use of quoted spreads to estimate costs. Likewise, several commenters...
suggested that the commenter’s estimates of potential harm are overstated by as much as 90%. Consequently, the Commission acknowledges that to the extent that the Pilot impacts spreads in a certain small number of test group stocks, this could engender costs to investors. However, as described above, the Commission believes that the estimate of $1 billion per year is likely a significant overstatement of the actual costs that would be incurred in such a scenario. The commenter’s $4 billion estimate is based on the comparison between the spreads on a maker-taker exchange compared to the spreads on a taker-maker exchange described above in Section IV.C.2.b.iv(2), which the Commission views as even more imprecise than the $1 billion estimate for the reasons laid out above. Beyond the concerns expressed in Section IV.C.2.b, the Commission notes that the difference between the spreads of a maker-taker exchange and a taker-maker exchange would result from the difference between the fee paid to post an order and the rebate to post. As such, the implied impact of no rebates would be no more than ½ the spread difference. Thus, using the full spread difference overstates costs by a factor of 2. Further, to get the $4 billion estimate, the commenter applied the spread differential to all NMS securities. Because Test Group 2 will be only about 12.5% of securities, applying the spread differential to all NMS securities overstates the cost by a factor of 8. In sum, using the commenter’s approach, but correcting for these issues, would yield a cost 16 times smaller than the commenter’s, or $125 million.

v. Impact on Issuers

Several commenters expressed concerns that adverse effects to liquidity could induce long-term costs, such as higher costs of capital for issuers subject to certain Test Groups where the result of lower rebates. The Commission acknowledges that to the extent that the Pilot impacts spreads in a certain small number of test group stocks, this could engender costs to investors. However, as described above, the Commission believes that the estimate of $1 billion per year is likely a significant overstatement of the actual costs that would be incurred in such a scenario.

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vi. Costs to Broker-Dealers of Reverse Engineering Identities in the Order Routing Data

Some commenters expressed concern that proposed public dissemination of order routing information would enable competitors to gain proprietary information regarding trading strategies. The commenter suggested incentives to provide liquidity are reduced, likely affecting small and mid-capitalization issuers most severely. One commenter believed that issuers would have higher costs of capital as a result of wider spreads, making any attempts to raise capital more expensive, particularly for issuers in certain Test Groups of the Pilot. Additionally, a number of commenters also expressed concerns that wider spreads due to a reduction in rebates could also adversely affect issuers that engage in share repurchase programs.

The Commission addresses these comments in the capital formation analysis in Section IV.D.3 and concludes that the Pilot is not expected to have a large impact on issuer cost of capital. While the Commission acknowledges the risk that the Pilot may impact liquidity for some securities, as explained above, the Commission believes that the impact of such an effect on the cost of capital for such securities would likely be minimal. With the exception of the impact on cost of capital, one commenter stated that the Pilot will require burdensome expenditures by public companies at the start and conclusion of the Pilot. The Commission recognizes that some national securities exchanges and broker-dealers are public companies that could incur the costs described in Sections IV.C.2.a and IV.C.2.b.ii at the start and conclusion of the Pilot. However, the commenter did not provide details on what expenditures other public companies will incur as a result of the Pilot. The Commission does not know what such expenditures would be or what they would entail; nevertheless, we do not believe that there will be any such expenditures.

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that, for example, market participants could learn the identities of individual broker-dealers by sending a specific broker-dealer an order for a relatively thinly-traded security and then study the order routing reports to identify which broker-dealers transacted that security on a given day. The concern is that if market participants can identify the primary venues that certain broker-dealers tend to rout to, then they may be able to price information along with live market data to identify specific trading algorithms of individual broker-dealers. This could increase transaction costs for broker-dealers if the market participants are able to use this data to identify when a certain algorithm is being used to execute a trade in live time and then to opportunistically trade around the algorithm to profit from any price impact created by the trades.

As described above, the Commission has modified its proposal in response to these comments. Consequently, the Commission is not adopting the requirement that exchanges publicly post the order routing datasets and instead the Commission will receive the order routing data. This change significantly reduces the risks identified by the commenters about reverse engineering, and the Commission is sensitive to the need to protect the data from unauthorized disclosure.

**D. Impact on Efficiency, Competition, and Capital Formation**

The Commission has considered the effects of the Pilot on efficiency, competition, and capital formation. The Commission believes that many of the direct effects of this rule on efficiency, competition, and capital formation would likely be temporary in nature and affect markets only for the duration of the Pilot. The Commission believes that the information obtained as a result of the Pilot could improve regulatory efficiency. Additionally, the Commission believes that the Pilot could have a number of temporary impacts on efficiency, including: The efficiency of capital allocation, price efficiency and price discovery, and the efficiency of fees and rebates.

As discussed in detail above, the Commission believes that there is significant uncertainty regarding the effect, if any, that the Pilot will have on liquidity and trading volume on exchanges. Therefore, the Commission is unable to determine ex ante the overall effects the Pilot will have on the efficiency of capital allocation, price efficiency, or the efficiency of fees and rebates. However, the Commission believes that the Pilot will provide useful data that will better inform future policy recommendations of the effects of fees and rebates on price efficiency.

The Pilot will provide the Commission with an opportunity to empirically examine the effects of an exogenous shock to transaction fees and rebates on order routing behavior, execution quality and market quality. Insofar as the data produced by the Pilot permits the Commission and the public to evaluate and comment upon the potential impacts of alternative policy options, the rule may promote regulatory efficiency. In the absence of the Pilot, the Commission would have to rely on currently available data to inform future policy decisions related to transaction-based fees and rebates and data limitations may impair the efficiency of policy decisions based on this information.

The temporary efficiency impacts the Commission expects during the Pilot depend on how the Pilot fees and rebate restrictions for the two Test Groups balance the interests of different groups of market participants. For example, if during the Pilot, the lower fee cap and no-rebate restriction induced by the 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 Pilot may temporarily improve the efficiency of capital allocation by lowering execution costs. Alternatively, the 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 transaction 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 Pilot, lower transaction fees could improve the 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 transaction fees, improving quality and possibly creating a liquidity externality. Whereby lower transaction fee venues will become the preferred trading center for marketable and non-marketable orders. 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 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, most 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 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 rebates received by broker-dealers for particular orders. 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 Pilot, and temporarily improving pricing efficiency and price discovery.

Therefore, as an additional benefit of the Pilot, the Pilot will allow an examination of the temporary effects of revisions to transaction fees and rebates on quoted spreads, to better inform future policy recommendations of the effects of exchange transaction-based fees and rebates on price efficiency. On the other hand, if the reduction in rebates and Linked Pricing harms liquidity, then the Pilot may temporarily impair price efficiency and the price discovery process. A reduction in rebates could cause informed traders to route more of their non-marketable orders to off-exchange trading venues, which could reduce price discovery, because these orders would no longer be included in displayed quotes or limit order book depth. If liquidity temporarily worsens, then it may lead to a temporary widening of the NBBO, which could lead to a decline in the overall informational efficiency of prices. If liquidity worsens, it could also cause informed traders to route more of their marketable orders off-exchange, which could harm price discovery by reducing the ability of market participants to discern the direction of their order flow. However, if spreads widen or queues shorten, it could attract informed non-marketable orders onto exchanges, which could improve price discovery, because exchange quotes would be more informative. Because the Commission cannot predict the effects of the Pilot on liquidity and competition between exchanges and off-exchange trading venues for order flow, the Commission is unable to determine the overall effects of the Pilot on price efficiency and the price discovery process.

Changes in liquidity could also impact the price efficiency of ETPs. A change in liquidity for either the ETP itself or the underlying securities could impact the create-redeem process for ETPs. This process is an important element in ETP price efficiency and helps to keep the price of the ETP in line with the value of its underlying securities. If there is a mispricing, authorized participants can trade on the mispricing by either purchasing the underlying shares to create a share of the ETP, or by redeeming a share of the ETP and selling the assets underlying the ETP. These actions affect the existing supply of ETP shares and help to eliminate mispricing. Consequently, if the Pilot impacts liquidity in either the underlying assets, or the ETP itself, it will impact the cost to authorized participants of eliminating mispricing by participating in the create-redeem process. Since the Commission does not know how the Pilot will impact liquidity, it cannot quantify the effects of the Pilot on ETP price efficiency. If the Pilot results in improved liquidity for the stocks in the various Test Groups, or for the ETP itself, then its impact on the create-redeem process may be positive and ETP price efficiency may increase as its value may more closely track the value of its underlying assets through a lower cost create-redeem process. The opposite is true if the Pilot negatively affects liquidity in either the ETPs or the underlying securities.

Finally, the Commission acknowledges that the fee caps and prohibition on rebates or Linked Pricing imposed on the Test Groups during the 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 less efficient from the exchanges' perspective. The rule 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 Pilot could enable the analysis of market impacts stemming from changes to fees, potentially permitting the Commission to assess alternative requirements for transaction-based fees and rebates that may be more efficient.

Several commenters asserted that fee and rebate restrictions proposed by the Commission would be government-imposed price-controls that would increase inefficiencies and harm consumers. One of these commenters elaborated that “Government-imposed price controls are well understood to have a negative impact on competition and innovation” and that “they are only
indicated where they overcome severe market imperfection such as monopoly ownership of a critical resource." 875 As discussed in detail above, 876 the Commission believes that the current fee and rebate system may have resulted in a number of market failures, including rebates incentivizing brokers to route orders to trading venues that pay the highest rebates, instead of the venues that offer better execution. However, the Commission currently lacks the data to estimate the extent of any existing market failures. 877 While the Commission acknowledges that the Pilot’s restrictions on rebates and fees could potentially harm efficiency, if these market failures currently do exist, then the fee and rebate restrictions in Test Group stocks could temporally improve efficiency for the duration of the Pilot. Additionally, the information the Commission learns from the Pilot could be used by the Commission in future rulemakings to inform future policy decisions. 878

2. Competition

This section discusses the potential effects of the Pilot on competition. The Commission believes that the Pilot would give a temporary effect on the competitive dynamics between exchanges, exchanges and off-exchange trading venues, broker-dealers, and issuers, particularly ETFs. Additionally, as discussed in detail below, 879 the Pilot could potentially have competitive effects for smaller exchanges that last beyond the Pilot. This could occur if the Pilot attenuates the potentially distortive impact of transaction-based fees and rebates and causes broker-dealers to route orders to trading centers they perceive as more liquid. This could have a lasting effect on the order flow and may cause smaller exchanges if it produces a liquidity externality that persists beyond the Pilot. 880 However, the Commission believes that this is unlikely to occur, because the Pilot would be for a limited duration and the effects are unlikely to be significant enough to cause this result. 881

Because the Commission is unable to determine ex ante the Pilot’s effects on liquidity, 882 the Commission is unable to quantify many of the effects of the Pilot on competition. In the sections below the Commission offers a qualitative discussion of the effects of the Pilot on competitive.

a. Competition Between Exchanges and Off-Exchange Trading Venues

This section discusses the potential effects of the Pilot on competition between exchanges and off-exchange trading venues, including ATSs, which, as discussed in the baseline, 883 execute approximately 14% of trading volume. Although the Pilot could temporarily affect the competition for order flow between exchanges and off-exchange trading venues, the Commission believes that the overall effects of the Pilot on this competition are unclear, because, as discussed in detail below, there are reasons why the Pilot may temporarily increase as well as decrease the order flow routed to off-exchange trading venues.

A number of commenters argued that restricting exchange rebates and fees for stocks in the test Groups without placing similar restrictions on off-exchange venues could place exchanges at a competitive disadvantage. 884 Although the Commission acknowledges that the Pilot may potentially place exchanges at a competitive disadvantage relative to off-exchange trading venues, the Commission believes that the overall effects of the Pilot on this competition would depend on how on-exchange liquidity is affected by the Pilot as well as the renegotiation costs that off-exchange trading venues incur in order to take advantage of the restrictions on exchange fees and rebates. For example, as discussed in detail above, 885 ATSs sometimes negotiate bespoke agreements with individual subscribers for a bundle of services. If the costs of renegotiating these agreements are high, then off-exchange trading venues may not be able to adjust their pricing models to take advantage of the exchange pricing restrictions, in which case competition between exchanges and off-exchange trading venues could be unaffected. 886

Additionally, as discussed below, if off-exchange renegotiation costs are high, some of the restrictions on transaction fees could give certain exchanges a competitive advantage relative to off-exchange venues in attracting certain types of order flow. However, if off-exchange renegotiation costs are small or the Pilot fee and rebate restrictions for certain exchange trading venues, then the Pilot could affect competition between exchanges and off-exchange trading venues.

Although the Commission acknowledges that the distribution of trading volume could change between exchanges and off-exchange trading venues, the Commission believes these changes are difficult to determine in advance and cannot predict ex ante whether these changes would increase or decrease exchange market share. 887 As discussed above, 888 the Commission lacks data on the current pricing schedules offered by off-exchange venues as well as information on how this affects the routing decisions of broker-dealers. The Commission also lacks information on how difficult it is for off-exchange trading venues to adjust their pricing schedules. Additionally, as discussed above, 889 the Pilot’s effects on liquidity could be either positive or negative and vary across securities. Therefore, the Commission is unable to quantify or determine the overall effects that the Pilot will have on competition between exchanges and off-exchange trading venues. However, if competitive rebalancing among trading centers occurs as a result of the Pilot, it could provide information to the Commission about order routing decisions and execution quality to inform future policy actions.

Commenter statements regarding the effects of the Pilot on competition between exchanges and off-exchange trading venues indicated that the Pilot could have different effects on the competition for marketable and non-marketable order flow. In considering the comments, and as analyzed in the following sections, the Commission considered the differential impact on a subset of securities (i.e., stocks in the Test Groups).

One commenter agreed and stated the Pilot could cause a shift in the balance of activity between exchanges and off-exchange trading centers, but that the direction of such a shift cannot be presupposed. See Declimus Letter, at 1-2. This commenter also noted that transaction-based fees are one of the drivers behind the current shift by market participants to off-exchange trading centers.

See supra Section IV.B.2.a.

Commenters expressed concern that the Pilot would inhibit exchanges’ ability to compete with off-exchange trading centers, in part due to a reduced ability to innovate on changes to fees and rebates. See, e.g., Choe Letter I at 7, 16–17; Nasdaq Letter I, at 6; NYSE Letter I, at 1–2, 4–3; Magma Letter, at 2; FIA Letter, at 3–4; ASA Letter, at 3; P&G Letter, at 1; ACCO Letter, at 1; Johnson Letter, at 1.

See supra note 47 and accompanying text.

It might be used for an ATS to renegotiate these agreements with all of their clients in order to take advantage of the exchange price restrictions.

885 See infra Section IV.D.2.b (Competition Between Exchanges).

886 See infra Section IV.D.2.b (Competition Between Exchanges).

887 See supra Section IV.C.2.b.iv.

888 See supra Section IV.B.2.a.

889 See supra note 47 and accompanying text.

883 See infra Section IV.D.2.b (Competition Between Exchanges).

880 See Proposing Release, supra note 2, at 13042, for a discussion of a liquidity externality.

879 See infra Section IV.D.2.b (Competition Between Exchanges).

884 See supra Section IV.B.2.a.

878 See supra Section IV.A.

877 See supra Section IV.B.1. and Section IV.C.1.a.ii.

876 See supra Section IV.B.1.

875 See supra Section IV.B.2.a.
changes in exchange fees and rebates could have on the competition between exchanges and off-exchange trading venues for marketable and non-marketable order flow. As the discussion above indicates, and as commenters point out, it is not clear how the Pilot will affect the competition between both marketable and non-marketable order flow. Additionally, since the impacts of the Pilot on liquidity may not be uniform across all securities, the effects of the Pilot on competition for marketable and non-marketable order flow may not be uniform across all securities. Therefore, as discussed above, the Commission is unable to quantitatively estimate how the Pilot could affect competition between exchanges and off-exchange trading venues to attract different types of order flow. In the sections below the Commission offers a qualitative discussion regarding how various effects of the Pilot could affect this competition.

i. Marketable Order Flow

The Pilot could increase or decrease the share of marketable order flow routed to off-exchange trading venues. This is reflected in the divergent views of commenters, who argue over the effects that reduced access fees and rebates could have on the share of marketable order flow routed to off-exchange trading venues. In considering these comments, the Commission considered a number of ways the Pilot could potentially impact competition for marketable order flow, including:

The impact of changes in liquidity, the direct impact of changes in access fees and rebates, the impact of changes in off-exchange fill rates, and the impact of the Order Protection Rule.

Changes in liquidity caused by the Pilot could affect how much marketable order flow is directed to off-exchange trading venues. However, because the overall effects of the Pilot on liquidity could be positive or negative and vary across securities, the overall effects of changes in liquidity on the direction of marketable order flow are also unclear. Therefore, the Commission is unable to predict the overall effect that changes in liquidity caused by the Pilot will have on the competition for marketable order flow between exchanges and off-exchange trading venues.

A number of commenters argued that if the Pilot temporarily decreases liquidity in the test groups due to the elimination or reduction of rebates, more order flow will likely be directed to off-exchange trading venues. As the Commission previously discussed, the competition between on and off exchange venues for order flow is characterized as providing a tradeoff between immediacy and execution quality. Off exchange venues tend to get better trade execution on average than lit exchanges, largely because they trade between the prevailing NBBO, but at the cost of not being able to guarantee that a transaction will occur. Thus, the impact of the Pilot on the competition between exchanges and off-exchange venues for marketable order flow will depend on how the Pilot impacts execution quality and the cost of immediacy on exchanges compared to the potential for price improvement and the chance of filling an order at an off-exchange venue.

If a reduction in rebates causes quoted spreads to widen, it could increase the attractiveness of off-exchange price improvement and would likely cause more institutional or proprietary marketable order flow to be directed to off-exchange ATGs. Additionally, if spreads widen, broker-dealers would likely be incentivized to internalize more marketable institutional order flow. If spreads do not widen, a decrease in quoted depth could also result in more marketable orders being routed off-exchange. If quoted depth decreases, and if market participants believe that off-exchange venues offer improved execution, it could cause more large marketable orders to get routed to ATGs or be internalized, in order to avoid the increased costs of walking up the book. Alternatively, if liquidity improves, it could reduce the cost of immediacy and the benefits of off-exchange price improvement, which could result in more marketable order flow being routed to exchanges.

Changes in exchange access fees and rebates for stocks in the test groups could also directly affect whether some types of marketable order flow are routed to exchanges or off-exchange trading venues. However, as discussed in detail above, the Commission currently faces limitations in determining the effects that exchange transaction fees and rebates have on order routing decisions. The Commission is unable to quantify how changes in exchange transaction fees and rebates for stocks in the test groups will affect the routing decisions for marketable order flow between exchanges and off-exchange trading venues. Therefore, the Commission is unable to determine in advance what changes in exchange transaction fees and rebates caused by the Pilot will have on the competition for marketable order flow. One of the goals of the Pilot is to provide the Commission with data that it can better evaluate these effects.

If renegotiation costs are too high for off-exchange trading venues to adjust their pricing schedules, lower transaction fees on maker-taker exchanges could cause some marketable order flow that would be routed ATGS and other off-exchange trading centers to instead be routed to these exchanges. For example, if the equilibrium transaction fee in Test Group 2 is below $0.0030 in the absence of rebates, exchanges may be able to draw order flow away from off-exchange trading centers.

Several commenters agreed that lower access fees could induce some market participants to bring order flow back to exchanges. One of these commenters stated that "the potential that substantially lower take fees in test group securities will counter any potential loss of rebate-driven volume." One commenter disagreed and noted that lowering fees would not attract marketable order flow to exchanges. This commenter noted...
that high access fees drove market participants to route orders to off-exchange trading centers, then lower cost venues, such as NYSE American or EDGA would have larger market share.\footnote{See infra Section IV.D.2.a.ii (Nonmarketable Order Flow).} Another commenter disagreed and argued that “the cost of accessing lit markets in the form of access fees on securities exchanges has been one of the key drivers behind the continuing proliferation of non-exchange trading venues.”\footnote{See NYSE Letter II, at 12.} Given the disagreement among commenters, the Commission believes it is possible that lower transaction fees could potentially result in more marketable order flow being routed to exchanges. However, as discussed above, the Commission faces limitations in quantifying the effects that lower exchange transaction fees will have on marketable order flow and is unable to determine how likely this is to occur. One of the goals of the Pilot is to provide the Commission with data so that it can better evaluate these effects.

To the extent that conflicts of interest affect order routing,\footnote{See supra Section IV.A.1 (Market Failure at the Broker-Dealer Level).} lower rebates on take-maker venues could potentially increase the off-exchange share of trading volume by causing broker-dealers to increase the internalization of smaller marketable orders, even if off-exchange liquidity or execution quality does not change.

Changes in the fill rates of orders at off-exchange trading venues could also affect how much marketable order flow is directed to off-exchange trading venues. However, there are reasons the Pilot could increase or decrease the fill rates of orders at off-exchange trading venues. Therefore, the effect these changes will have on the competition for marketable order flow is uncertain. As discussed below,\footnote{See supra Section IV.B.2.b.} there are reasons the Pilot could cause an increase or decrease in the non-marketable order flow routed to off-exchange trading venues. If there is an increase in the non-marketable order flow routed to off-exchange trading venues, then the fill rates of marketable orders routed to off-exchange trading venues would increase, which could cause more marketable order flow to be directed to off-exchange trading venues. Alternatively, a decrease in the non-marketable order flow routed to off-exchange trading venues would cause a decrease in the fill rate for marketable orders, which would cause less marketable order flow to be directed to off-exchange trading venues.

One factor that could reduce the chance of marketable orders being routed away from exchanges is that exchanges have a protected quote. One commenter believed that any off-exchange shifts are likely to be limited because these trading centers do not have a protected quote, and any shifts that would occur would still need to be consistent with best execution and not just redistribution to account for market participants’ cost considerations.\footnote{See supra Section IV.C.2.b.iv.} However, given that 34% of all transaction volume occurs off-exchange at trading venues without a protected quote, it is unclear how much effect a protected quote will have on this competition.\footnote{See id.}

The Commission does not expect the Pilot will have a significant effect on the competition for retail marketable orders. Normally, these orders are internalized by off-exchange wholesale broker-dealers who pay retail broker-dealers for the order flow.\footnote{See Healthy Markets Letter, at 10. Another commenter also emphasized that exchanges have the advantage of a protected quote and that they have an advantage in receiving orders that require immediate execution. See IEX Letter II, at 8.} Since the Pilot does not restrict these rebates, the Commission does not expect the Pilot to affect the routing of marketable retail order flow.

**ii. Nonmarketable Order Flow**

The Pilot could increase or decrease the share of non-marketable order flow routed to off-exchange trading venues. This is reflected in the divergent views of commenters, who argue over the effects that reduced rebates could have on the share of non-marketable order flow routed to off-exchange trading venues. In considering these comments, and as discussed below, the Commission considered factors that could affect the decision to supply liquidity on exchanges or at off-exchange trading venues. Furthermore, in considering comments, the Commission also considered a number of ways the Pilot could potentially impact competition for non-marketable order flow, including: The impact of changes in rebates, the impact of changes in liquidity, and the impact of changes in off-exchange fill rates.

The decision to submit a non-marketable order on-exchange or route it to an off-exchange trading venue is a trade-off between the profits earned from providing liquidity on-exchange compared to the expected execution price and probability of having the order filled off-exchange. Higher exchange rebates, wider spreads, higher on-exchange fill rates (shorter on-exchange queue lengths), and lower off-exchange fill rates would all increase the chance of a trader deciding to provide liquidity on-exchange compared to routing an order to an off-exchange venue.\footnote{See supra Section IV.C.2.b.} The impact of the Pilot on the competition between exchanges and off-exchange venues for non-marketable order flow will depend on how the Pilot affects these dimensions.

The Commission believes that the overall effect on the competition between exchanges and off-exchange venues for non-marketable order flow from a reduction in rebates for stocks in the test groups is unclear, because a reduction in rebates could result in either an increase or decrease in marketability.\footnote{See supra Section IV.C.2.b.} In theory, a reduction in exchange rebates without any changes in liquidity or fill rates would likely cause more non-marketable order flow to be routed to off-exchange trading venues. However, the Commission believes that this event is unlikely, because a reduction in exchange rebates and transaction fees could also affect liquidity. Since a reduction in exchange rebates and transaction fees could cause liquidity to increase or decrease,\footnote{See supra Section IV.B.2.} it could also cause the share of non-marketable order flow routed to off-exchange trading venues to increase or decrease.
non-exchange trading centers, because exchanges will be restricted from providing rebates as incentives for liquidity provision, whereas non-exchange trading centers could freely offer rebates and other incentives to draw orders away from exchanges. In contrast, several commenters disagreed and noted that ATSSs generally do not pay rebates and tend to charge lower fees than the large exchanges, and that such a pricing model would make it challenging for ATSSs to start providing rebates sufficiently large enough to draw volume from exchanges. If rebates incentivize liquidity provision by providing extra revenue to liquidity providers, a reduction in rebates for stocks in the Test Groups could incentivize them to divert some of their non-marketable liquidity providing orders from maker-taker exchanges to off-exchange trading venues. However, this decision could also be affected by how the rebate reductions impacted other dimensions of liquidity, so the overall effect is difficult to determine.

As discussed above, changes in liquidity could also affect the decision regarding where to route non-marketable limit orders. Since the effects of the Pilot on liquidity could be either positive or negative, the Commission is uncertain how these changes will affect the competition for non-marketable order flow between exchanges and off-exchange trading venues. If on-exchange liquidity worsens and bid-ask spreads widen or quoted depth decreases, then institutional traders could direct more of their non-marketable orders to supply liquidity on maker-taker exchanges, either because realized spreads increased or because the market structure and fill rates of their off-exchange non-marketable orders increased. Alternatively, if liquidity improves and either bid-ask spreads tighten or quoted depth increases, then institutional traders could direct more of their non-marketable orders to off-exchange venues, because the profits earned from providing liquidity decreased.

Changes in the rate that orders are filled off-exchange could also affect changes in the routing of non-marketable orders between exchanges and off-exchange trading venues. However, as discussed above, the effect of the Pilot on the fill rate of off-exchange non-marketable orders is unclear. Therefore it is difficult to determine the Pilot’s effect on the routing of non-marketable orders. Changes in the rates at which non-marketable orders are filled off-exchange depend on how the routing of non-marketable order flow to off-exchange trading venues changes. If a reduction in fees causes more marketable orders to be routed to exchanges it could reduce the fill rate of off-exchange orders, which could cause institutions or proprietary traders to substitute some of their off-exchange orders with non-marketable orders to supply liquidity on maker-taker exchanges. Alternatively, if the Pilot causes more marketable orders to be routed to off-exchange trading venues it could increase off-exchange fill rates, which could cause more orders that would have supplied liquidity on exchange to be routed to off-exchange venues. However, as discussed above, the Commission is unclear whether the share of marketable order flow routed to off-exchange trading venues will increase or decrease.

The Commission does not expect the Pilot to have a significant effect on the competition between exchanges and off-exchange trading centers. For example, the restrictions on fees and rebates that run through the fee cap for securities in Test Group 1 will still be routed to exchanges. The restrictions on rebates in Test Group 2 may cause some of these rebates to be routed to maker-taker exchanges. The Commission believes that the Pilot, while changing either transaction fees or rebates on certain subsets of securities, could leave the margins that exchanges obtain from transaction-based pricing models unchanged. On the one hand, this could preserve the current state of competition among exchanges in the market for those securities. For instance, it may be possible for exchanges to modify fee structures in a way that leaves margins unchanged and does not impact competition between exchanges.

On the other hand, the restrictions on fees and rebates could also alter the competitive dynamics between different exchanges. For example, the restrictions on fees and rebates could make

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\(912\) See supra Section IV.C.2.b.i.\(913\) One commenter disagreed with this view and suggested that even though the fee cap for Proposed Test Group 1 was half of the current level, “there was still significant enough differentiation available in the fee structure that trading may not appear materially different than the control group.” See Credit Suisse Commentary, at 3. However, another commenter argued that the fee cap in Proposed Test Group 1 would reduce the exchange’s ability to compete on fees by 50%. See Choe Letter I, at 16.

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exchanges more similar in Test Group stocks. The Pilot could also alter competition between exchanges by causing exchanges to choose to compete less intensively for order flow in one Test Group, and instead focus on stocks and ETPs in the other Test Group. 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 Test Group 1 using fees from Control Group stocks. This may increase competition for order flow in one Test Group while reducing it in the other. In the presence of tighter restrictions on transaction-based fees during the Pilot Period, exchanges could also compete in other ways to attract trading volume (e.g., discounts on connectivity fees or increased volume discounts), although the Commission acknowledges that for Test Group 1 the ability to offer meaningful volume discounts would be limited in light of the $0.0010 fee cap in that group.

The Pilot also could affect competition between large and small exchanges. The restrictions on rebates resulting from the Pilot could harm smaller exchanges that may be competing by providing large rebates rather than by producing better prices or execution quality. As discussed in the Proposal, liquidity tends to consolidate. Therefore, if smaller exchanges are unable to pay larger rebates in test stocks, they may lose order flow to larger, more liquid exchanges. 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 Pilot, depending on the extent of the liquidity externality, smaller exchanges could experience long-lasting competitive effects, such as a reduction in trading volume that continues after the expiration of the Pilot. The 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.

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. In theory, this could lead to consolidation or exit by small exchanges as a result of the Pilot. However, the Commission 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 Commission recognizes that the potential temporary competitive impacts stemming from the 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 the prohibition on rebates and Linked Pricing applicable to Test Group 2 would apply to a higher proportion of its trading volume. However, the Commission believes that, given its aim of producing representative groups of stocks and ETPs for the purposes of the Pilot, trading centers are not likely to be substantially more exposed to NMS stocks in any one group.

923 See supra Section IV.D.2.a. 924 See, e.g., Healthy Markets Letter I, at 27 (noting that exchanges use fees collected to pay rebates). 925 For NMS stocks included in Test Group 2 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. 926 See supra Section IV.B.2.a. 927 See the discussion of a liquidity externality in the Proposing Release, supra note 2, at 13042. 928 See id. 929 See supra Section IV.D.2.b.i. 930 See credit Suisse Commentary, at 4. 931 See supra note 823 and accompanying text. 932 See supra Section IV.C.2.b.i. 933 See supra Section IV.C.2.b.ii. 934 See id. 935 See supra Section IV.C.1.b. 936 See supra Section IV.C.2.b.iii. 937 Nine commentator suggested that the effects of the Pilot may be permanent. See NYSE Letter I, at 4, 8. 938 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 & Spatt, supra note 530. However, some commenters suggested that the loss of fee differentiation would lead to an increase in revenues as exchanges try to make up for lost revenue through other means. See, e.g., Fidelity Letter, at 8; Choe Letter I, at 16–17.

939 One commentator said that restricting transaction fees would disproportionately hurt small exchanges because "large exchanges have diversified revenues away from transaction fees." See Magma Letter, at 2. 940 One commentator believed that the loss in fee differentiation could lead to consolidation and fewer venues overall. See Credit Suisse Commentary, at 5. 941 See supra Section IV.C.2.b.i (Loss of Exchanges' Fee Revenue).
c. Competition Between Broker- Dealers

The Pilot also could affect competition between broker-dealers. One commenter believed that, due to differences in broker-dealer business models, any reduction in rebate incentives or other forms of payment for order flow would increase transaction costs, and that large broker-dealers would be better able to adapt to increased trading costs and rebate reductions than small or middle-market broker-dealers. The commenter believed that the Pilot would disproportionately advantage large broker-dealers who specialize in low touch execution or own ATSs because more customers and order flow would migrate to the largest brokers, and that the “Commission should and is required to undertake a rigorous cost-benefit analysis to justify any policy that favors one group of Brokers over another.”

The Commission believes that the Pilot will disproportionately affect small and large broker-dealers, but differences in the potential compliance costs they face make it unclear whether the Pilot will disproportionately advantage large broker-dealers over small or middle-market broker-dealers. Although larger broker-dealers may possess economies of scale which may enable them adapt better to changes in fees and rebates, they are also more likely to be members of exchanges and subject to the compliance costs of adjusting their systems due to changes in exchange fee and rebate schedules discussed above. As of December 2017, of the approximately 3,860 broker-dealers registered with the Commission, only 297 are listed as having memberships with at least one exchange and would encompass the set of executing broker-dealers that would be most affected by the Pilot. Therefore, it is likely that many small or middle-market broker-dealers will not have to bear the compliance costs discussed above.

Additionally, since larger broker-dealers are more likely to be subject to these compliance costs, they may need to increase their commission rates more than smaller broker-dealers to compensate for these increased costs. This could potentially offset any advantage that larger broker-dealers may possess in being able to absorb any revenue loss caused by a reduction in payment for order flow, such as by being able to offer smaller increases in commissions compared to smaller broker-dealers. However, the Commission cannot quantify this difference, because it lacks sufficient data on the differences in commission rates between large and small broker-dealers.

d. Competition Between Issuers

A number of commenters noted that the Commission, in the Proposing Release, did not discuss the competitive effects to issuers (common stocks) from inclusion in various Test Groups of the Pilot. While the Pilot could potentially affect product market competition between issuers that compete in the same product market by affecting their ability to raise capital, the Commission does not believe that this is likely to occur. Since the Commission does not believe that the Pilot will have a significant effect on the ability of issuers to raise capital, the Commission does not believe the Pilot will have a significant effect on product market competition between issuers.

Some commenters argued that the Pilot could inadvertently pick “winners and losers” through the selection of securities to Test Groups. One commenter believed that issuers in certain Test Groups could become “less attractive investments than control group issuers” while another thought this could “skew the competitive dynamic between issuers and impact the ability of the affected issuers to raise capital.” They argue that among securities with similar characteristics, securities that can offer higher rebates will attract more liquidity and trading volume at the expense of securities with lower rebates. Several commenters argued that issuers included in the test groups with reduced access fees or rebates would experience wider spreads, which would put them at a competitive disadvantage compared to peer firms in the control group by making it more expensive for them to engage in secondary offerings or conduct share repurchase programs. One commenter argued that this would disproportionately affect “small to medium issuers” where “[l]iquidity rebates can be critical . . . to motivate market makers to support the stock with aggressive and actionable quotations.” Although some securities may experience changes in liquidity as a result of the Pilot, as discussed in detail below, the Commission does not believe that issuers, including small and mid-capitalization issuers, will experience significant increases in the cost of capital as a result of the Pilot.

However, if the Pilot does differentially affect the cost of firms in the same product market to raise capital, it could affect product market competition between issuers more difficult for the firms that experienced an increase in capital costs to compete. While the Commission acknowledges that theoretical and empirical studies suggest that an increase in costs of capital can affect product market competition, the Commission does not believe the Pilot will have such an effect on product market competition between issuers. While the Commission acknowledges that some issuers may observe a widening of spreads and possible reductions in liquidity provision, as discussed below, the Commission does not believe that the Pilot will have a significant effect on capital formation for issuers.

Therefore, the Commission does not believe the Pilot will have a significant effect on product market competition between issuers. Furthermore, the Pilot will allow the Commission to obtain data to be able to analyze the impact of

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Footnotes:

942 See supra note 805.
943 See infra Section IV.D.3 (Capital Formation).
944 See, e.g., Anixter Letter, at 1; STANY Letter, at 2; NYSE Letter, at 2; Johnson Letter, at 1; Cott Letter, at 1; P&G Letter, at 1; Nasdaq Letter I, at 8-9. One of these commenters urged the Commission to further analyze and study the potential impact of the Transaction Fee Pilot on issuers and their securities (as well as investors in those securities), including the impact on competition between issuers in the pilot test groups and those in the control group. See Anixter Letter, at 1. Another commenter argued that the Commission was “treating all issuers the same without consideration for the very significant differences in how the securities of different sized and priced companies trade.” See Nasdaq Letter I, at 8.
945 See infra Section IV.D.3 (Capital Formation).
946 See id.
947 See Nasdaq Letter I, at 10; Invesco Letter, at 2 (discussing the competitive effects for ETPs).
948 See NorthWestern Letter, at 2.
949 See Ethan Allen Letter, at 1. See also McDermott Letter, at 1; ProAssurance Letter, at 1; Era Letter, at 2; and Avangard Letter, at 1-2.
changes to fees and rebates and how those changes affect a myriad of issues, including their impact on competition between issuers.

e. Competition Between ETPs

The Pilot may also impact the competitive dynamics between ETPs. Although some ETPs could potentially be eliminated by the Pilot's effect on this competition, there is uncertainty regarding the Pilot's effect on the liquidity of ETPs and therefore on competition between ETPs.

Unlike common stocks, whereby trading and investing in those securities is likely driven by firm-specific characteristics, ETPs with similar investment strategies may be more subject to competitive dynamics. For example, some ETPs may follow the same underlying index, and only differ in expense ratios, trading characteristics, and in some cases, tracking error. Although some of these characteristics may be meaningful distinctions for long-term investors, such as expense ratios, other characteristics, such as trading characteristics, including transaction costs, are likely to be meaningful to market participants that trade rather than invest in some ETPs. For example, ETPs that are subject to higher rebates may benefit and attract more liquidity and trading volume at the expense of similar ETPs in different Test Groups that are restricted to offering lower rebates. A decrease/increase in secondary market demand for an ETP could cause a decrease/increase in the total assets under management of the ETP’s sponsor by causing authorized participants to redeem/create creation units of ETP shares in order to take advantage of arbitrage opportunities in the secondary market.

However, one commenter (itself an ETP sponsor) noted that the competitive effects for ETPs would likely be temporary and minimal, and would have little effect on investor behavior; therefore, the benefits of including ETPs in the Pilot outweigh the potential costs of competitive impacts for ETPs.

One commenter stated that these competitive effects are likely to be more challenging for small or less liquid ETPs that rely on “market maker support and require those same firms to provide seed capital (e.g., capital investments).” These commentaries raise issues that reductions or prohibitions on rebates in certain Test Groups could exacerbate the anticompetitive effects for the small, less liquid ETPs in these programs by causing degradation in liquidity provision for these ETPs.

The Commission acknowledges that the Pilot could potentially alter the competitive dynamics between and demand for similar ETPs that are placed in different Test and Control groups.

One commenter noted that ETPs in test groups with significant rebate reductions or restrictions could be disadvantaged competitively to similar ETPs not subject to changes in rebates, and because of the nature of ETPs, may lose market share to their competitors. See Nasdaq Letter I, at 8. Many commenters agreed with this argument. See ICI Letter I, at 4; FIA Letter, at 1; Nuveen Letter, at 2; BlackRock Letter, at 1–2; Fidelity Letter, at 9; SIFMA Letter, at 4–5; Issuer Network Letter, at 3; Oppenheimer Letter, at 3; Fidelity Letter, at 9; Invesco Letter, at 2; State Street Letter, at 3; Oppenheimer Letter, at 3; Clearpool Letter, at 7–8; Angel Letter I, at 2; STANY Letter, at 4; BlackRock Letter, at 1–2. One commenter believed that the Pilot could “unintentionally advantage ETFs in the lower fee group.” Credit Suisse Commentatory, at 6.

See supra Section IV.C.2.b.iv.2.

For example, three ETPs that track the S&P 500 index have expense ratios of 0.4 bps (SPY), 5 bps (IVV), and 4 bps (VOD). On a $10,000 holding over a year, this results in fees of $9, $5, and $4, respectively, whereas on a 100-share trade, a widening of spreads by one tick would result in a cost of $1.

See supra Section IV.C.2.b.iv.

A decline in an ETP’s liquidity could also cause demand to migrate to another type of investment vehicle, such as a mutual fund, that follows the same investment strategy.

The Pilot could inadvertently create “winners and losers” among ETPs through both competitive shifts and the potential exit of liquidity providers, and for some ETPs if these costs are severe, could lead to exit by certain ETPs from the market. However, as discussed in detail above, since the Commission does not know ex ante how the Pilot will affect the liquidity of ETPs, it is unable to quantify the effects that the Pilot will have on competition between ETPs. One of the goals of the Pilot is to provide the Commission with data so that it can better evaluate these effects.

In addition to affecting ETP competition through changes in ETP liquidity, the Pilot could also affect ETP competition by virtue of the Pilot’s effect on the liquidity of the underlying securities, which could create the create-redeem process for ETPs. This could affect the price efficiency of the ETP by impacting the cost to authorized participants of eliminating mispricing by participating in the create-redeem process. For example, if the majority of an ETP's underlying securities are placed in the same test group and experience a decline in liquidity, it could cause the deviation between the ETPs price and its NAV to increase, i.e., the price of the ETP could deviate more from the price of its underlying securities. This could cause demand for the ETP to decline and trading volume to migrate to a similar ETP with a lower deviation between its price and NAV, whose underlying securities might not have experienced a decrease in liquidity. However, because of the random nature of the assignment of securities to Pilot groups and the fact that similar ETPs may experience similar liquidity changes in their underlying securities, the Commission does not believe that this will have a significant impact on competition between ETPs.

3. Capital Formation

The Commission does not expect the Pilot to have a substantial permanent impact on capital formation because the Pilot is limited in duration and because it is not expected to have a large impact on issuer cost of capital. However, many of the implementation costs associated with the Pilot would require exchanges to expend resources that they may have otherwise invested elsewhere or distributed to shareholders in order to

See supra Section IV.C.2.b.iv.

See Section IV.2.b.(iv).
maintain the List of Pilot Securities and any changes to those lists, as well as the maintenance of the Exchange Transaction Fee Summary and the order routing data. As discussed above, the Commission is unable to determine whether the overall temporary impact of the Pilot on liquidity and total transaction costs, because the Pilot's effects on liquidity could be positive or negative and vary across securities. As a result, it is unclear to what degree the Pilot will temporally promote or harm capital formation. On one hand, the Pilot could temporally 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 undertaking financial risks. As a result, the 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 Pilot.

On the other hand, the temporary reduction in rebates to certain Test Groups as a result of the implementation of the Pilot could widen quoted spreads, thereby potentially leading to worse execution prices and subsequently reducing liquidity for the duration of the Pilot. This would have similar indirect impacts on capital formation but in the opposite direction, by increasing the cost of hedging financial risks. Potentially, if the Pilot leads to a significant deterioration in liquidity for some listed issuers, longer term, it could affect capital formation for these securities by increasing the costs for them to raise capital. Further, the Pilot could lead to a delay by some issuers to raise additional capital during the Pilot's duration. A number of commenters agreed with these assessments and expressed concern that the random assignment to certain Test Groups could adversely affect issuers' ability to raise capital or manage their capital structure, by increasing the cost of secondary offerings or the costs associated with share repurchase programs.

Several commenters argued that these effects would be worse for small and medium-sized companies. In theory, if the temporary impacts on liquidity acutely impact some firms, it could lead to the potential exit of these issuers from the capital markets, either through acquisition or delisting. These risks could be greater for smaller issuers, because they may not possess enough capital to ride out negative liquidity shocks. However, the Commission does not believe that this is likely to occur because smaller issuers tend to have high transaction costs relative to fee and rebates.

Alternatively, a number of commenters disagreed and did not think the Pilot would have a significant impact on issuers' ability to raise capital. The Commission agrees with these commenters. As discussed in detail below, due to the limited magnitude of the effects of the Pilot study, and the uncertain impacts on liquidity, the Commission does not expect the Pilot will have significant effects on the ability of firms to raise capital.

The 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 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. Such revisions to portfolio composition as a result of the 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. 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.

One commenter analyzed secondary offerings from its listed issuers during 2017 and found that lower liquidity was associated with a higher cost of capital. The Commission points out that the analysis performed by this study merely examines associations between spreads and capital costs and does not establish that wider quoted spreads cause higher costs of capital. To supplement this comment, Commission staff analyzed the same secondary offerings and found that after controlling for fundamental issuer characteristics, such as size, book-to-market, and analyst coverage, the size of the quoted spread was not positively related to issuers' costs of capital.
The Commission notes that a temporary effect on transaction costs may not have the same impact on cost of capital as a permanent effect on liquidity and does not believe that any temporary increase in transaction costs resulting from the Pilot could be significant enough to affect issuers' costs of capital. Indeed, the experience with the recent Tick Size Pilot provides an example of a temporary change in liquidity that did not affect cost of capital. While several studies found that the Tick Size Pilot increased transaction costs, the findings of a DERA white paper suggest that the market did not expect the Pilot to affect stock prices of companies in the Test Groups.

Specifically, the paper finds that the announcement of the assignment of stocks to the Test Groups and the Control Groups did not generate significant abnormal returns for stocks in the Test Groups, either in absolute terms or relative to stocks in the Control Group. Under the standard assumption that the market's expectations about the effects of the Pilot were correct, this result indicates that the increase in quoted spreads and transaction costs during with the Pilot had no impact on stock prices. Thus, these findings cast doubt on the idea that temporary changes in transaction costs affected the cost of capital of small capitalization companies. In addition, because the Tick Size Pilot enacted a 500% increase in the tick size, that pilot could arguably have a bigger direct impact on transaction costs than the Transaction Fee Pilot, which would reduce rebates by 30% of a tick.

One commenter disagreed and believed that the findings of the DERA white paper were flawed. This commenter argued that the DERA study "relies on a selective, narrow, and irrelevant data set" and that "focusing on a few days around the time when stocks were assigned to test groups within the Tick Pilot, and not a materially longer period of time during which the Tick Pilot's quoting and trading restrictions were in effect," is a clear indication that DERA narrowly tailored its study to reach a specific and flawed conclusion. This commenter stated that it "does not believe that the White Paper supports any conclusion regarding the impact of the Tick Pilot on issuers or the potential impact of the Transaction Fee Pilot on issuers." However, another commenter noted that "DERA's event study is informative to a central criticism," raised by some commenters that "upon implementation of the [Pilot], spreads would widen in stocks chosen for the 'low rebate' or 'no rebate' buckets and that wider spreads will harm issuers of the impacted stocks." This commenter found the "lack of price impact . . . telling," because "the price of . . . stock is the primary measure" of "potential harm to issuers . . . ." This commenter explained that, "if liquidity diminishes, or expected returns of the stock decline, this would be reflected in the value of the stock—and no such statistically significant decline in value was found." The commenter believed that the short duration of DERA event study was appropriate because "markets rapidly incorporate new information" into stock prices.

The Commission agrees with this commenter and believes that the DERA white paper used an appropriate methodology to study how the increase in quoted spreads and transaction costs from the Tick Size Pilot affected the stock prices and cost of capital of firms in the Test groups. The Commission believes that the DERA white paper did not rely on a "selective, narrow, and irrelevant data set" and instead picked the appropriate time period, the few days surrounding publication of the list of which stocks would be included in the test and control groups, to examine how the market reacted to the information about which stocks would have their spreads widen as a result of the Tick Size Pilot. This approach is standard in the academic literature because information is quickly incorporated into stock prices at the time it is made public. The Commission believes that the DERA white paper is relevant to this Pilot because it examines how a firm's cost of capital is affected by a temporary widening of the firm's spreads, which is a potential effect of this Pilot.

As discussed above and noted by the commenter, if a firm's cost of capital increased as a result of the wider spreads caused by the Tick Size Pilot, we would expect that stock's price to decline during the announcement of test and control groups. The Commission recognizes that another paper comes to the opposite conclusion regarding the impact of the Tick Size Pilot on costs of capital, but does not find the paper convincing. This paper compares the stock price reactions of stocks in the test and control groups around the time the Tick Size Pilot was implemented. They find that stocks in the test groups that experienced a decrease in liquidity when the tick size widened also experienced a decrease in prices, relative to stocks in the control group, around the time the Tick Size Pilot was implemented. However, it is unclear exactly what the return differences documented in the study are measuring. If investors expected that test group stocks would experience a temporary reduction in liquidity during the Tick Size Pilot and that this would make it more costly for those stocks to raise capital, then standard economic assumptions would expect to see a negative stock price reaction for test group stocks around the announcement of the Tick Size Pilot test and control group stocks, not during the time period following the Tick Size Pilot implementation.

Given the results of the DERA study and the uncertainty surrounding the Albuquerque et al. (2018) results, combined with the fact that the average trading cost increase, i.e. decrease in liquidity, during the Tick Size Pilot is greater than the expected potential effects on liquidity during the Transaction Fee Pilot, the Commission...
believes that the costs of capital are unlikely to significantly increase for Test Group stocks due to a temporary decrease in liquidity during the Transaction Fee Pilot. Because the Tick Size Pilot was conducted on firms with small market capitalizations, this should also help alleviate concerns for small to mid-capitalization issuers about temporary decreases in liquidity increasing the costs related to raising capital. One commenter agreed that, although some issuers may have temporary widening of spreads over the Pilot duration, any changes to liquidity caused by the Pilot are unlikely to affect the costs to firms when raising capital. Therefore, the Commission does not believe that issuers, including small and mid-capitalization issuers, will experience significant increases in the cost of capital as a result of the Pilot.

E. Alternatives

The Commission considered several alternatives to the Pilot, including: (1) Proceed to propose rule amendments without first conducting a Pilot; (2) expand the Pilot to include off-exchange venues, including ATSs; (3) include a trade-at-provision; (4) conduct alternative pilots; and (5) adjust the design of the Pilot (e.g., including a number of alternatives proposed by commenters).

1. Propose Rulemaking Without Conducting a Pilot

Several commenters suggested that the Commission should proceed with rulemaking rather than first conducting the Pilot. For example, as discussed elsewhere in this release, as an alternative to conducting the Pilot, one commenter suggested that the Commission impose a "gradual reduction of the current fee cap across all stocks periodically." Such an approach would address the concerns raised by a number of commenters, discussed above, about the potential impact on largely identical ETPs and listed issuers that are placed in different test groups, without the added cost and complexity of rotating stratified samples through the Pilot. In addition, such an approach could provide data on successive reductions in the current fee cap, which could be useful to the Commission if it considers future policy making to reduce the Rule 610(c) fee cap.

However, depending on the number of fee caps to be tested, this alternative would increase instability in the markets in terms of the fee regime that markets are subject to. This would occur because the cap would be reduced successively and linearly and each tranche would need to be in place for a sufficient amount of time in order to obtain statistical power. Further, without a control group, researchers would be unable to conduct a differences-in-differences analysis as the data would be subject to the impact of events across time, which would frustrate the ability of researchers to compare groups to one another over time. The Commenter was open to having a control group not subject to the decline in fees, which would allow for identifying causality. However, even with the inclusion of a control group, this alternative would still increase the time in which markets are subject to instability in fees and rebates and the time needed to understand the impact of fees and rebates because at each different fee level the Commission would need to test that fee level for a sufficient time to gain statistical power. Further, including a control group in this alternative could potentially result in different treatment for largely identical ETPs, as in the adopted Pilot, but with an increase in the potential time needed for study. Alternatively, this commenter suggested that the Commission implement "dynamic, stock specific ticks with transaction fees capped at, for example, 10% of the tick size (e.g., $0.0010 per share if a penny tick; $0.0050 per share if a nickel tick.)" Another commenter suggested that, rather than pursuing the Pilot, the Commission should amend Rule 610(c) to reduce the access fee cap to $0.0010 and also conduct "an abbreviated study of the effects of eliminating rebates" similar to the "no-rebate" Test Group. One commenter recommended that the Commission "ban maker-taker and inverted transaction fee pricing as well as all volume-based discounts that are not clearly and directly related to cost savings" while another suggested that the Commission enhance the duty of best execution in lieu of a pilot. Several commenters opined on the potential benefits and reduced costs of these alternatives as compared to proceeding with the Pilot. For example, according to one commenter, a gradual "walk down" approach would be preferable to the Pilot because it would allow the Commission to "observe order routing behavior changes, while applying the same economics to all stocks uniformly" and would "eliminate concerns about issuers being subject to disparate treatment." According to this commenter, it also would "eliminate[] concerns that the Pilot results will not reflect the actual outcome if such changes are applied more broadly to stocks outside of the Pilot." Similarly, another commenter noted that it would be "more effective and less damaging to the equities market to strengthen and better articulate the broker-dealers' Duty of Best Execution" than proceeding with the Pilot, which the commenter believed would impose "tremendous costs" to investors and potentially "upend[] the existing economics and framework around equity executions." Further, one commenter noted that because "there is broad recognition" that the access fee cap should be reduced, there is no need to incur the costs associated with the Pilot and the Commission should simply reduce the fee cap to $0.0010 to ensure that displayed prices reflect the actual economic costs of an execution, while also allowing exchanges to continue to offer rebates to incentivize liquidity provision if they chose to do so, while also maintaining their net capture rates. This commenter believed that lowering the fee cap to $0.0010 would provide "immediate benefits to the equities markets with respect to price transparency and addressing conflicts of interest" and would be "better calibrated with today's market pricing." Another commenter argued that "the effects of maker-taker and inverted transaction fee pricing on the markets are well understood" and therefore concluded that it was very unlikely that "we will learn anything of value about the economics of exchange transaction fee pricing from the Pilot." Consequently, this commenter believed that the Commission should mandate that the exchanges return to a traditional transaction fee pricing

\[\text{\textsuperscript{1012} Morgan Stanley Letter, at 2.}\]
\[\text{\textsuperscript{1013} Id. at 2.}\]
\[\text{\textsuperscript{1014} Choe Letter I, at 12, 21-22. See also Nasdaq Letter I, at 2 ("referring to the Pilot as a ‘risky experiment.")}\]
\[\text{\textsuperscript{1015} Goldman Sachs Letter, at 1, 3.}\]
\[\text{\textsuperscript{1016} Id. at 1-3.}\]
\[\text{\textsuperscript{1017} Id. at 4.}\]
\[\text{\textsuperscript{1018} Larry Harris Letter, at 6-11. See also Goldman Sachs Letter, at 4 (stating there is "broad support in favor of lowering the Fee Cap today,") and the Pilot "will not yield a different conclusion."}\]
model, which the commenter believed would not result in much cost to market participants.1019

However, other commenters strongly supported the Pilot as a first step because it “should provide data to enable the Commission to determine the impact of transaction-based fees and rebates on order routing behavior, on execution quality and on market quality” and believed the data collected would “support appropriate reforms to U.S. equity market structure.” 1020

Among those who supported conducting the Pilot before considering rulemaking, one commenter noted the lack of information regarding the rebates paid by each exchange to each broker and stated that such lack of disclosures “reinforce the difficulty in assessing the impact of the structure of associated fees on distorting best execution, conflict[s] of interest and competitiveness of exchange pricing.” 1021 Still another commenter opined that the Pilot “is a necessity” to provide a “quantitative approach to which stocks require non-exchange trading centers” because the Commission would be unable to “follow order flow across all trading venues in the market, leaving it with an incomplete picture of the issues it seeks to study.” 1022

The diversity of opinion and lack of consensus among the commenters regarding the impact of fees and rebates on market quality and order routing behavior support the view that further study in this area is warranted before permanently adopting any changes through rulemaking. As discussed above, there was sharp disagreement between commenters about the potential impacts of reductions in fees and rebates, yet there is little data available to evaluate these claims on a broad scale. The Commission believes that there is no need to delay proceeding with the Pilot in order to pursue other potential equity market structure initiatives. Equity market structure issues have been considered for a number of years and, as a result of several initiatives in this area, the Commission has developed the Pilot, which is focused on and is intended to gather empirical evidence on the impact of exchange transaction fees and rebates. Similarly, the Commission does not believe that it needs to complete the Pilot before proceeding to consider all other equity market structure initiatives. The Commission expects that it will continue to evaluate the need for other changes to equity market structure during the pending of the Pilot.

2. Expand Transaction Fee Pilot To Include Non-Exchange Trading Centers

The Transaction Fee Pilot would not require ATSs or other non-exchange trading venues to comply with the limits on transaction fees or rebates imposed by the Pilot. Some commenters believed that non-exchange trading centers should be included in the Pilot and that the representativeness of the data obtained from the Pilot would be impaired by the exclusion of ATSs and other off-exchange trading centers. 1023 For example, one commenter stated that the Pilot “would not gather any insight into the trading patterns at those centers” because the Commission would be unable to “follow order flow across all trading venues in the market, leaving it with an incomplete picture of the issue it seeks to study.” 1024

Another commenter believed that excluding non-exchange trading centers could skew the results of the Pilot, as broker-dealers could shift order flow away from exchanges in response to the Pilot, thereby limiting the Commission’s understanding of the overall impact of changes to transaction-based fees and rebates. 1025

An alternative design that includes non-exchange trading centers like ATSs would be broader than the Pilot—not only because such a design would include more trading venues, but also because such a design would have to account for the fact that non-exchange trading centers like ATSs use other inducements, besides transaction-based fees and rebates, to incent order flow. 1026 The inclusion of non-exchange trading centers could, therefore, supply information about a more complete set of order routing decisions, increase the representativeness of the results obtained, and provide a deeper understanding regarding the ways in which exogenous shocks to transaction-based fees and rebates (and other inducements) affect order routing decisions. For example, a pilot that included non-exchange trading centers, and regulated the inducements used by such centers, might impact payment for the internalization of retail order flow, which would allow researchers to evaluate how these inducements affect retail order routing. A pilot that addressed payment for order flow on non-exchange trading centers could, in turn, result in more retail order flow being routed to lit exchanges, which also could increase displayed liquidity and potentially improve price efficiency.

However, the inclusion of non-exchange trading venues may be difficult to implement. First, non-exchange trading venues charge idiosyncratic and individually-negotiated fees to market participants, and often bundle fees for ATS usage with other broker-dealer fees, such that it would be exceptionally difficult to create and then impose a uniform fee regime on such venues. 1027 For example, it is unclear how an ATS that charges an “all in” flat fee for service and does not charge individually for executions would be able to comply with a transaction-based fee cap. To comply with the Pilot’s transaction-based pricing restrictions, non-exchange venues may be required to entirely restructure their customer relationships to move to a transaction-based pricing model for the duration of the Pilot, which would impose notable costs on those venues. Further, any alternative design would address other inducements provided by non-exchange trading centers aside from transaction-based fees and rebates, in order to produce a fully accurate analysis of the impact of fees and inducements on order routing behavior, market quality, and execution quality. Such a design would be much more complex that the current Proposal. Finally, an alternative design that included non-exchange trading centers also would impose costs on such venues that would be higher relative to the costs imposed on exchanges under the current design, because the Pilot would require non-exchange trading venues to track and report more detailed information than is currently required by the

1019 See Section II.A.4 for a summary of these comments. Some commenters believed that non-exchange trading centers should only be subject to the rebate prohibitions of the no-rebate Test Group. See, e.g., Capital Group Letter, at 3; AJO Letter, at 1; Nasdaq Letter III, at 2.

1020 NYSE Letter I, at 9. See also, e.g., Cboe Letter I, at 12, 19; Nasdaq Letter I, at 2, 5; VisibleMkt Letter, at 1–2.

1021 Wellington Letter, at 2. See also, e.g., Oppenheimer Letter, at 2. One commenter also believed that the Pilot could affect the way that securities are traded off-exchange and confound the Commission’s ability to understand the baseline for remuneration occurring off-exchange or the impact that the Pilot has on that baseline. Nasdaq Letter I, at 7. The Commission does not believe that its ability to analyze the impact of changes to transaction-based fees and rebates will be unduly limited, due to information that is now available from Regulation ATS–N and Rule 606.

1022 See, e.g., Morgan Stanley Letter, at 3 n.5; BIDS Letter, at 1–2; AJO Letter, at 2.
Commission. As discussed above, exchanges are required to file each fee change with the Commission on Form subject to those requirements. Thus, in an alternative version of the Pilot including non-exchange trading venues dramatic shift in the disclosure regime Letter, at able to estimate the fraction of ATS trading as a percentage of total trading in NMS securities over the same time period. The expected impact on liquidity of the inclusion of a trade-at test group is unclear. The recently concluded Tick Size Pilot included a trade-at test group. The Tick Size Pilot included a trade-at group because exchanges were concerned that, in the current market environment, a significantly larger tick size could induce order flow to go off exchange. For the Transaction Fee Pilot, commenters were split on whether marketable order flow would be more or less likely to flow to off-exchange trading centers, with some believing that as access fees for some test groups decline, order flow could be drawn back to exchanges. However, in considering the Tick Size Pilot, it is important to note that it only considered the impacts of trade-at when the tick size was increased and only for smaller, less liquid stocks. The effects might not be the same with 1 cent tick size and more liquid stocks. The effects might not be the same with 1 cent tick size and more liquid stocks that are included in the Pilot. One commenter noted that in the trade-at test group for the Tick Size Pilot, the number of shares displayed at the NBBO increased and quote volatility was reduced in the trade-at test group relative to the other test groups. Nevertheless, analysis of the Tick Size Pilot data does not reveal significant execution quality or market quality effects of a trade-at rule. Specifically, the data suggests there was no change in effective spreads or price efficiency due to the trade-at requirement. Results from the Tick Size Pilot also suggest that trade-at impacts trade location. Specifically, off-exchange share of trading volume decreased and off-exchange market share increased, particularly at inverted exchanges. However, volume for midpoint crossing off-exchange venues increased, but this could be the result of the midpoint exception to the Tick Size Pilot’s trade-at requirements. This shift in trading volume may occur because a trade-at provision increases incentives to display prices because 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. These findings suggest that the inclusion of a trade-at test group may benefit exchanges, which may experience increased trading volumes, but be costly for off-exchange venues, which may lose trading volume.

4. Alternative Pilot

One commenter suggested an alternative to the Pilot that would involve directly lowering the Rule 610(c) access fee cap to $0.0010 and establishing a moratorium on fee increases for existing market data, connectivity, and co-location services. The commenter believed its alternative would allow a direct test of the “anachronistic” 610(c) fee cap level and make exchange fees more competitive with off-exchange venues. In addition, similar to the other alternative discussed directly above, it would impose a lower cap on

1028 Although Form ATS-N requires ATSs to provide public disclosures about the different types of fees they charge, along with the ranges of those fees and service bundling, these discloses do not provide as much information as the fee disclosures that will be required by the Pilot.
1029 By 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.
all NMS stocks simultaneously and thereby address the potential competitive impact on largely identical ETPs and listed issuers. The commenter suggested this alternative would reduce the complexity of implementation and would avoid “introducing new classes of restrictions” including prohibition on payment of transaction-based rebates. Further, in linking transaction fees to market data and connectivity fees, the commenter suggested that its alternative would address commenters’ desire “to reduce their cost to trade” without banning rebates for liquidity provision, which it argued could negatively impact displayed quotes.

However, the combined fee cap and moratorium would not feature a control group. While the commenter suggested the Commission could “use comparisons to the preceding period to evaluate its efficacy,” the absence of a control group could frustrate researchers’ ability to detect changes as the results could be influenced by short-term external events. This alternative also does not directly test the absence of rebates.

Further, the direct link between transaction fees and market data and connectivity fees is unclear in the context of the Pilot’s objectives. In particular, the potential distortions that can accompany fee-and-rebate pricing models are unique to exchange transaction fee-and-rebate pricing models and do not directly result from market data and connectivity services. It is therefore unclear how the moratorium on market data fees would impact the objective of the Pilot to study how rebates and fees affect order routing decisions and market quality.

Finally, the commenter’s suggested moratorium would only apply to “existing” market data and connectivity and would therefore preserve current fee levels for those services and would seem to not restrict an exchange’s ability to offer new and improved market data, connectivity, and co-location services potentially at higher fee levels. While a moratorium on market data and connectivity fees during a transaction fee experiment could be beneficial to the extent it holds steady a separate variable that can have a marginal impact on order routing, those costs are fixed and therefore the impact, if any, would be slight. Further, to the extent that exchanges were free to introduce new products at different price points, the moratorium could be easily circumvented. Accordingly, with the exception of the moratorium on market data fees, the suggested alternative is substantively similar to the alternative discussed above to not conduct any pilot and instead proceed to immediately lower the 810(c) fee cap.

5. Adjustments to the Transaction Fee Pilot Structure

The alternatives described above provide significant revisions to the approach or the representativeness of the Transaction Fee Pilot. This section complements and expands on the discussion in Section II.C., above, to discuss a number of alternatives and adjustments to the basic structure of the Pilot. 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 Group 1.

a. Length of the Core Pilot

The core Pilot would last for two years with an automatic sunset at the end of the first year unless the Commission publishes a notice determining that the Pilot shall continue for up to one additional year. Alternatively, the Pilot could feature an earlier or later Pilot sunset or a longer or shorter Pilot duration. As discussed above in Section II.D., a number of commenters discussed the proposed Pilot duration, with some believing the proposed duration would incentivize participation and disincentivize “waiting out” the Pilot, with others believing that a shorter duration would be sufficient to produce results and still others recognizing that the Pilot run for a full two year period with no automatic sunset. Further, one commenter questioned the Commission’s statement that the market reacts quickly to pricing changes implemented by exchanges, but that some market participants might not change their behavior unless the Pilot was in place for at least a year.

As alternatives to the Pilot’s duration, the Commission considered an earlier Pilot sunset that would shorten the anticipated Pilot duration, reducing the time period during which potential negative (or positive) temporary effects resulting from the Pilot could occur. However, if the anticipated duration of the Pilot were too short, some broker-dealers could 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. In other words, in response to the comment noted above, while many market participants may quickly adopt their order routing in response to fee and rebate changes, others may take longer to respond. A shorter anticipated duration also could reduce the usefulness of the information and the benefits provided by the 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.

Conversely, as the anticipated Pilot duration increases so too would the changes for exchanges, which could extend the duration of the changes to their revenue models and the costs of compliance with the Pilot requirements. However, all else being equal, increasing the duration beyond the automatic sunset at one year, or up to the maximum two years, is unlikely to provide any significant increases in the benefits identified above, unless some event occurs during the first year that impacts the Pilot study in a way that potentially could make the results unrepresentative, in which case an extension of the Pilot for additional time (up to two years) could increase the benefits. As discussed in Section IV.C.1.a.i, the Commission believes that the Pilot duration 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 Pilot or retain pre-Pilot order routing decisions for its duration. Further, a longer Pilot duration would increase the exposure of market participants to the uncertain outcomes of the pilot and the costs of compliance, trading volume, market quality.

See infra Section IV.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 Pilot had a short duration.

To address commenter concerns about the size of the Pilot, the Commission performed a supplemental analysis that refined the power analysis included in the Proposing Release. Based on this refined power analysis, the Commission estimates that it would require a minimum Pilot duration of 12 months to achieve sufficient statistical power to detect whether an effect is actually present; therefore, any Pilot duration shorter than 12 months would have diminished ability to detect the effect of transaction-based fees and rebates on order routing decisions, execution quality, and market quality. See Section IV.C.1.a.iii(1) and supra note 135 for further information on this supplemental analysis.
The Commission could alternatively adopt 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. On the other hand, the Commission 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 unlikely 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 Pilot.

b. Length of Pre- and Post-Pilot Periods

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 Pilot restrictions as well as across stocks in different test groups. Alternatively, the Commission could adopt shorter pre-Pilot and post-Pilot Periods, which a few commenters recommended.1044 Shorter pre-Pilot 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 reduced ability of the Pilot to produce representative results.1045

In particular, a short pre-Pilot Period introduces additional risk that analysis of certain Pilot periods 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.

c. Zero Access Fee Test Group

As discussed above, a few commenters recommended that the Pilot include a zero access fee test group to further test the relationship between exchange fee models and order routing, which would effectively serve to temporarily remove a source of revenue for exchanges entirely from a subset of securities.1046 This approach could produce additional information, such as how order routing behavior and execution quality change 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.

The inclusion of a zero access fee test group would 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 with uncertain outcomes for both exchanges and market participants. Doing so presents the risk that if coupled to the current Pilot, the inclusion of a zero access fee test group could contaminate the analysis of both the current test groups and the zero access fee test group. This could occur if exchanges determine that it is cheaper to subsidize trading in the zero access fee group with revenue earned from the control group and the other test groups. In this case the inclusion of the zero access fee test group would alter the behavior of the exchanges with regard to all their other securities, which would weaken the exogeneity of the shock imposed by the Pilot for all test groups.

d. Alternative Test Groups

As discussed above, the Pilot will have two test groups: (1) One that caps access fees at $0.0010 and (2) 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 instead have proposed only caps on access fees (i.e., fees for removing liquidity), similar to those in the EMSAC recommendation, or could have increased the number of test groups to test more gradations in alternative fee caps. As a few commenters suggested, and as discussed above, the Commission also could have included a test group with a higher fee cap level than Rule 610(c) or no cap on fees at all.1047 Further, as discussed above, a few commenters suggested other alternatives, like basis point pricing or pricing based on the tick size.

Many alternatives would have replaced the no-rebate test group with another access fee cap group. These options could provide information to help refine the analysis of the impact of access fees on various market outcomes. However, if the Pilot did not include a no-rebate test group and only studied exogenous shocks to access fees, it would produce more limited information about the role that rebates play in affecting market outcomes. As discussed in more detail above, the Commission believes that it is important to have a test group that specifically focuses on the removal of rebates and the corresponding impact on conflicts of interest, execution quality, and market quality.

An alternative to increase the number of test groups to study the impact of the various levels of access fee on various market outcomes could produce additional refinement to the data currently in the Pilot. However, to produce more gradation in the caps to access fees, would increase the complexity of the Pilot, and potentially increase the implementation costs to account for the additional test groups. Increasing the number of test groups would also increase the number of stocks subject to the pilot thereby increasing the fraction of the market exposed to the uncertain outcomes of the Pilot.

e. Non-Displayed Liquidity and Depth of Book

Only Test Group 2, which eliminates rebates or Linked Pricing, would restrict...
fees or rebates or Linked Pricing in non-displayed liquidity and depth-of-book, though a small number of commentators suggested expanding those conditions to Test Group 1.\footnote{See Clearpool Letter, at 3–4; Healthy Markets Letter I, at 16.} As discussed in Section II.C, under the Pilot, 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 depth of the book as well as for displayed and non-displayed liquidity. If an exchange were to offer rebates for those types of orders, it would reduce the benefits of the no-rebate test group as it would inhibit the Commission’s ability to collect data on a treatment group in which rebates do not exist and thus cannot impact or potentially distort the markets and market participants.

An alternative could have applied the transaction fee restrictions in Test Group 1 to both non-displayed liquidity and the depth-of-book. However, the Commission believes this is unnecessary. In particular, the Commission does not believe that exchanges would have the incentive to charge higher fees or pay higher rebates for executions against or of non-displayed and depth of book compared to fees and rebates charged against or of top-of-book depth in Test Group 1 securities. Unlike the problem associated with exchanges offering rebates (in the no-rebate test group) for these types of orders that could emerge if rebates or Linked Pricing were not prohibited across the entire depth of the limit order book, the Commission does not believe that under the Pilot incentives would emerge for exchanges to charge higher fees to access non-displayed and depth-of-book quotes. Charging more for 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 and would be uncertain of their fees when they enter their orders. 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.

f. Linked Pricing

Test Group 2 will prohibit rebates and Linked Pricing. As discussed above, a few commentators suggested that the Commission also prohibit exchanges from offering other inducements, including discounts on non-transaction fees that are linked to trading volumes in the no-rebate Test Group.\footnote{See RBC Letter I, at 3; MFS Letter, at 2–3.} While such an approach would have the added benefit of testing a greater absence of exchange-offered inducements, it would further increase costs and add to the complexity and scope of the Pilot. As currently designed, the no-rebate Test Group is intended to test the extent to which exchange rebates introduce potential distortions to execution quality and market quality and introduce conflicts of interest in order routing. Adding more variables to the Pilot will increase its complexity, size, and cost, while potentially reducing benefits by inhibiting the Commission’s stated focus on gathering data specifically on the impact of exchange transaction rebates. With more variables, it becomes difficult to isolate the impact of any particular change without dramatically expanding the size, scope, and complexity of the Pilot.

Alternatively, the Commission could instead prohibit only rebates, without also prohibiting Linked Pricing, in Test Group 2. While such an approach would reduce costs and simplify the Pilot design, it could reduce the benefits of Test Group 2. Specifically, one of the aims of Test Group 2 is to examine the impact between take fees (rebates) and make rebates (fees) in current exchange fee-and-rebate pricing models. For example, as discussed above, fees may be set above their equilibrium price (within the current regulatory structure) in order to subsidize rebates. An alternative that prohibits rebates but not the ability of an exchange to cross-subsidize make rebates from take fees (or vice versa) would provide opportunities for exchanges to work around the rebate prohibition thus perpetuating the potential subsidization distortion. Consequently, such an alternative would reduce the benefits of Test Group 2 by reducing the effectiveness of the information received about NMS stocks in the no-rebate Test Group.

Finally, the Commission could ban Linked Pricing for all market participants in Test Group 2, including market makers. This alternative would allow the Commission to study how markets react in the absence of both rebates and Linked Pricing incentives, whereas the adopted Rule does not allow this analysis. The Commission recognizes that banning Linked Pricing in Test Group 2 may yield different results than under the adopted Rule, which permits an exchange to adopt rules to provide non-rebate Linked Pricing to its registered market makers in consideration for the market maker meeting rules-based market quality metrics. However, the Commission is interested in specifically exploring the effect of eliminating rebates, but continuing to allow Linked Pricing for a narrow, targeted segment of the market, i.e., market makers with specific obligations designed to improve an exchange’s market quality without the various effects previously discussed that may be associated with rebates, in order to understand any effects of rebates on liquidity. In so much as this is an alternative that could be considered at the completion of the Pilot, the Commission seeks to test specifically for this scenario.

g. Execution Quality Data

The Pilot does not require the exchanges to produce publicly available information on order execution quality statistics. As an alternative, the Commission could require that the exchanges produce daily order execution quality statistics similar to that required in Appendix B.1 of the Tick Size Pilot Plan. Compared to the Pilot, this alternative could provide information on order-based measures of execution quality such as effective spreads, price improvement, and realized spreads for liquidity taking orders, in addition to the trade-based measures available from public data sources. As noted in the baseline, order-based measures of execution quality from the incorporation of order size and the costs of latency, exchanges currently have systems in place to produce daily order-based execution quality data, which would limit implementation costs. However, the Commission recognizes that exchanges incur ongoing costs to produce these data.

Unlike for the Tick Size Pilot, the Commission does not believe that daily order-based execution quality statistics are as important for the Transaction Fee Pilot as it was for the Tick Size Pilot and that the benefits for the Transaction Fee Pilot could be marginal. In particular, the Commission believes that trade-based execution quality statistics will be sufficient to measure execution quality for liquidity taking orders and notes that the order routing data to be received by the Commission will contain data that
can facilitate the measurement of execution quality for liquidity providing orders.

h. Excluding or Rotating Securities

As discussed above in Section II.B., some commenters were concerned that the Pilot could introduce unintended adverse competitive effects for ETPs or corporate issuers that were placed in certain test groups if those test groups resulted in negative impacts on the trading characteristics of those securities. Accordingly, some commenters, discussed above, recommended either excluding ETPs from the Pilot, clustering ETPs following similar strategies into a single test group, or rotate ETPs through the various test groups and the control group.1051 Other commenters, discussed above, suggested allowing issuers to opt out of the Pilot.1052 The benefits of such an approach would be the avoidance of potential harm or disparate impact on a particular ETP or issuer vis-à-vis its peers and primary competitors. As discussed more fully above, that potential for harm is uncertain at best and commenters held deeply conflicting views with some asserting that the Pilot could cause widespread harm while others argued that its impact will be mostly positive when considering the potential distortions that will be mitigated or alleviated in the absence of exchange rebates or lower fees.

Although there is a potential for temporary competitive effects as a result of the Pilot, outright exclusion of ETPs or clustering like ETPs in the same test group would harm the representativeness of the data produced by the Pilot or the ability of the Pilot to facilitate analyses. Exclusion of ETPs, for example, could undermine the ability of the Commission to use the Pilot results to inform future policy making with respect to exchange fees, particularly if ETPs have the potential to respond differently to changes to fees and rebates than do other types of NMS stocks.

Similarly, as discussed above, allowing issuers to opt out of the Pilot could undermine the representativeness of the Pilot’s treatment groups and potentially bias the Pilot’s results, depending on the number of issuers that opt out and whether some unobservable characteristic is correlated with both an issuer’s decision to opt out and market outcomes. In turn, the benefits of the Pilot would be reduced if researchers are less able to draw specific conclusions about the impact of the Pilot as a result of issuers opting out of the Pilot.

Another alternative solution would be to rotate all stocks and or ETPs through each of the test groups for a given amount of time such that all stocks and ETPs spend the same amount of time in each test group. This methodology would reduce potential costs by mitigating potential competitive effects of the Pilot on issuers by ensuring that all stocks and ETPs receive similar exposure to each test group. Rotation would also have the advantage of allowing many more changes from one test group to another, which would create additional independent observations about the effect of the Pilot on various outcomes, potentially increasing statistical power.

The real advantage of additional statistical power would depend on how broker-dealers react to the changes. If broker-dealers need to adjust after every change, the statistical power could be lower with rotation than without. To the extent that broker-dealers design their order routing algorithms to the test group, then the time needed for broker-dealers to adapt to a set of Pilot securities that changes every few months would be minimal. The broker-dealer would simply replace one list of securities in a given test group with another. In this case there would likely be a period at the beginning of the Pilot where broker-dealers experiment somewhat to optimize their algorithms in which the data on broker dealer behavior would be noisier, but after that initial adjustment, broker-dealers would not need to repeat their experimentation after every rotation. However, to the extent that broker-dealers’ order routing algorithms are bespoke (i.e., security, rotation) could decrease the statistical power of the tests because each rotation would include a period of time during which broker-dealers adjust where the data is noisier and harder to extract a signal from.

This alternative, however, is also likely to be more complex and have higher costs than the Pilot. The exchange compliance costs of rotation would be marginally greater than the compliance costs of the Pilot because it would involve additional compliance checks and complexity, but would likely be largely automated. The added complexity for exchanges could be more significant because complexity increases the risk of errors. To the extent that broker-dealers set up their systems to automate the rotation, they, too would have only marginally higher costs with rotation. However, to the extent that broker-dealers’ order routing algorithms are bespoke to a given security, then rotation would be both more costly for broker-dealers who would have to re-optimize their algorithms every time a stock is included or excluded from a given test group.

V. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (“RFA”)1053 requires Federal agencies, in promulgating rules, to consider the impact of those rules on small entities. The Commission certified, pursuant to section 605(b) of the RFA,1054 that, if adopted, Rule 610T would not have a significant impact on a substantial number of small entities.1055

The Commission solicited comments regarding this certification and received one comment.1056 The commenter stated that “the Commission is obligated under the RFA to adequately address the Proposal’s costs to small-capitalization issuers covered under the statute.”1057 The commenter cited Aeronautical Repair Station Ass’n v. FAA as support for its assertion that the RFA requires the Commission to take into account costs to small-capitalization issuers as they are “third-party entities incurring downstream costs.”1058 The Commission believes the commenter misconstrues the legal finding in the case to which it cited, as the case confirms the general premise that the RFA analysis shall focus on the impact of a rule on a substantial number of small entities that are “directly affected and therefore regulated by,” “in other words subject to, such rule’s requirements.”1059 For purposes of the Commission rulemaking in connection with the RFA, Rule 610T, by its terms, applies only to national securities exchanges registered with the Commission under Section 6 of the Exchange Act.1060

1051 See supra Section II.B.
1052 See id.
1053 5 U.S.C. 601 et seq.
1054 5 U.S.C. 605(b).
1055 The Pilot is discussed in detail in Sections I and II above. We discuss the potential economic consequences, including the estimated compliance costs and burdens, of the Pilot in Section IV (Economic Analysis) and Section III (Paperwork Reduction Act) above.
1057 16 C.F. R. 14, n.50.
1058 See id. (citing 494 F.3d 161, 177 (D.C. Cir. 2007)).
1059 See Aeronautical Repair Station Ass’n v. FAA, 494 F.3d 161, 177 (D.C. Cir. 2007) (further stating that the RFA “requires that the agency conduct the relevant analysis or certify ‘no impact’ for those small businesses that are ‘subject to’ the regulation, that is, those to which the regulation ‘will apply.’”)
1060 See supra Sections III (Paperwork Reduction Act) and IV (Economic Analysis) (discussing, among other things, the current market environment and compliance obligations for national securities exchanges).
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 17 CFR 242.601 (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.\(^{1001}\) None of the national securities exchanges registered under Section 6 of the Exchange Act that would be subject to the Pilot are “small entities” for purposes of the RFA. In particular, none of the equities exchanges are exempt from Rule 601 of Regulation NMS. Accordingly, the proposed rule will not apply to any “small entities.” Therefore, for the foregoing reasons, the Commission again certifies that Rule 610T will not have a significant economic impact on a substantial number of small entities for purposes of the RFA.

VI. Statutory Authority and Text of the Rule Amendments

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, 78q, and 78w(a), the Commission amends 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 amends title 17, chapter II of the Code of Federal Regulations as follows:

PART 200—ORGANIZATION; CONDUCT AND ETHICS; AND INFORMATION AND REQUESTS

§ 200.30-3 Delegation of authority to Director of Division of Trading and Markets.

(a) * * *
(84) To issue notices pursuant to 17 CFR 242.610T(b)(1)(i) and (c) (Rule 610T(b)(1)(i) and (c).

PART 242—REGULATIONS M, SHO, ATS, AC, NMS AND SBSR AND CUSTOMER MARGIN REQUIREMENTS FOR SECURITY FUTURES

§ 242.610T Equity transaction fee pilot.

(a) Pilot pricing restrictions.

Notwithstanding §242.610(c), on a pilot basis for the period specified in paragraph (c) of this section, in connection with a transaction in an NMS stock, a national securities exchange shall 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 best offer of such market that exceed or accumulate to more than $0.0010 per share;

2. For Test Group 2, 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 maintaining market quality metrics; and

3. For the Control Group, impose, or permit to be imposed, any fee or fees in contravention of the limits specified in §242.610(c).

(b) Pilot securities—(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. Further, the Commission may designate by notice the assignment of NMS stocks that are interlisted on a Canadian securities exchange to Test Group 2 or the Control Group.

(ii) For purposes of this section, “Pilot Securities” means the NMS stocks designated by the Commission on the initial list of Pilot Securities pursuant to paragraph (b)(1)(i) of this section and any successors to such NMS stocks. At the time of selection by the Commission, an NMS stock must have a minimum share price of $2 to be included in the Pilot and must have an unlimited duration or a duration beyond the end of the post-Pilot Period. In addition, an NMS stock must have an average daily volume of 30,000 shares or more to be included in the Pilot.

(ii) For purposes of this section, “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) Pilot Group:
(1) Control Group;
(2) Test Group 1;
(3) Test Group 2;
(F) Stratum Code;
(G) 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 end of 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 paragraph (b)(2) of this section.

(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 S1 (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 paragraphs (b)(2) and (3) of this section 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) Pilot duration. (1) The Pilot shall include:

(i) A six-month “pre-Pilot Period;”
(ii) A two-year “Pilot Period” with an automatic sunset at the end of the first year, unless the later than thirty days prior to that time, the Commission publishes a notice that the Pilot shall continue for up to one additional year; and
(iii) A six-month “post-Pilot Period.”

(2) 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 facilitates trading in NMS stocks shall prepare and transmit to the Commission a file, 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 in paragraphs (d)(1) and (2) of this section. 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. Each national securities exchange shall treat the order routing datasets as regulatory information and shall not access or use that information for any commercial or non-regulatory purpose.

(1) Dataset of daily volume statistics, with field names as the first record and a consistent naming convention that indicates the exchange and date of the file, that include the following specifications of liquidity-taking orders by security and separating orders by order designation (exchanges may exclude auction orders) and order capacity:

(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) The broker-dealer’s CRD number and MPID.
(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 orders routed to another execution venue.
(xii) Cumulative number of shares of orders cancelled prior to execution.
(xiii) Cumulative number of shares of orders executed at receiving market center.
(xiv) Cumulative number of shares of orders routed to another execution venue.
(xv) Cumulative number of shares of orders cancelled prior to execution.
(xvi) Cumulative number of shares of orders executed at receiving market center.
(xvii) Cumulative number of shares of orders executed at receiving market center.
(xviii) Cumulative number of shares of orders executed at receiving market center.
(xix) Cumulative number of shares of orders executed at receiving market center.
(xx) Cumulative number of shares of orders executed at receiving market center.

(G) 5 minutes to <30 minutes of order receipt; and
(H) 30 minutes of order receipt.

(2) Dataset of daily volume statistics, with field names as the first record and a consistent naming convention that indicates the exchange and date of the file, that include the following specifications of liquidity-taking orders by security and separating orders by order designation (exchanges may exclude auction orders) and order capacity:

(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) The broker-dealer’s CRD number and MPID.
(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.
(xii) Cumulative number of shares of orders cancelled prior to execution.
(xiii) Cumulative number of shares of orders executed at receiving market center.
(xiv) Cumulative number of shares of orders executed at receiving market center.
(xv) Cumulative number of shares of orders executed at receiving market center.
(xvi) Cumulative number of shares of orders executed at receiving market center.

(G) 5 minutes to <30 minutes of order receipt; and
(H) 30 minutes of order receipt.
(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.
By the Commission.
Brent J. Fields,
Secretary.

Note: The following Appendix will not

Appendix A
Key to Comment Letters Cited in
Proposed Transaction Fee Pilot for NMS
Stocks (File No. S7-05-18):
1. E-mail from David Adorney, C & C
Trading LLC, to Commission, dated March 15, 2018 ("Adorney E-
mail").
2. Letter from Peter L. Swan, Professor of
Finance, School of Banking and
Finance, UNSW Sydney Business
School, to Brent J. Fields, Secretary,
Commission, dated March 26, 2018
("Swan Letter").
3. Letter from O. Mason Hawkins, CFA,
Chairman & CEO, et al.,
Southeastern Asset Management,
Inc., et al., to Brent J. Fields,
Secretary, Commission, dated April
6, 2018 ("Joint Asset Managers
Letter").
4. Letter from Adam D. Clark-Joseph,
University of Illinois at Urbana-
Champaign, to Brent J. Fields,
Secretary, Commission, dated April
9, 2018 ("Brent Joseph Letter").
5. Letter from Brent Woods, Chief
Executive Officer, and Joseph
Scafidi, Director of Trading,
Brandes Investment Partners, to
Brent J. Fields, Secretary,
Commission, dated April 10, 2018
("Brandes Letter").
6. Letter from Sal Arnuk and Joe
Saluzzi, Partners, Co-Founders
and Co-Heads of Equity Trading,
Themitis Trading LLC, to Brent J.
Fields, Secretary, Commission,
dated April 27, 2018 ("Themis
Trading Letter 1").
7. Presentation from the Institutional
Equity Division, Morgan Stanley, to
the Division of Trading and
Markets, Commission, dated May 1,
2018 ("Morgan Stanley
Presentation").
8. E-mail from Tim Quast, President,
Modern Networks IR LLC, to Brett
Redfearn, Director, Division of
Trading and Markets, Commission,
dated May 2, 2018 ("ModernIR E-
mail").
9. Letter from Sean D. Paylor, Trader,
AJO, L.P., to Brent J. Fields,
Secretary, Commission, dated May
7, 2018 ("AJO Letter").
10. Letter from Tim Quast, President &
Founder, Modern Networks IR LLC,
to Brent J. Fields, Secretary,
Commission, dated May 9, 2018
("ModernIR Letter").
11. Letter from Jeffrey P. Mahoney,
General Counsel, Council of
Institutional Investors, to Brent J.
Fields, Secretary, Commission,
dated May 10, 2018 ("CII Letter").
12. Letter from Kelvin To, Founder &
President, Data Boiler Technologies,
LLC, to Brent J. Fields, Secretary,
Commission, dated May 14, 2018
("Data Boiler Letter").
13. Letter from Chris Barnard to
Commission, dated May 14, 2018
("Barnard Letter").
14. Letter from David Mechner, Chief
Executive Officer, Pragma
Securities, to Brent J. Fields,
Secretary, Commission, dated May
14, 2018 ("Pragma Letter").
15. Letter from Stuart J. Kaswell,
Executive Vice President &
Managing Director, General
Counsel, Managed Funds
Association, to Brent J. Fields,
Secretary, Commission, dated May
15, 2018 ("MFA Letter").
16. Letter from Timothy J. Mahoney,
Chief Executive Officer, BIDS
Trading L.P., to Brent J. Fields,
Secretary, Commission, dated May
15, 2018 ("BIDS Letter").
17. Letter from Brent Robertson,
Managing Director, Trading, and
Rob Gouley, Principal, Trading,
Ontario Municipal Employees
Retirement System Administration
Corporation, to Brent J. Fields,
Secretary, Commission, dated May
15, 2018 ("OMERS Letter").
18. Letter from Marc Lipson, Robert F.
Vandell Research Professor,
Professor of Business
Administration, University of
Virginia School, Darden School of
Business, to Commission, dated
May 15, 2018 ("Lipson Letter").
19. Letter from Anthony W. Godonis,
Principal, Director of Trading,
Copeland Capital Management,
LLC, to Brent J. Fields, Secretary,
Commission, dated May 18, 2018
("Copeland Letter").
20. Letter from George Hessler, CEO,
Magma Trading, to Brent J. Fields,
Secretary, Commission, dated May
18, 2018 ("Magma Letter").
21. Letter from Eric Swanson, CEO, XTX
Markets LLC, to Brent J. Fields,
22. Letter from Douglas A. Cifu, Chief Executive Officer, Virtu Financial Inc., to Brent J. Fields, Secretary, Commission, dated May 23, 2018 ("Virtu Letter").
23. Letter from Susan M. Olson, General Counsel, Investment Company Institute, to Brent J. Fields, Secretary, Commission, dated May 23, 2018 ("ICI Letter").
24. Letter from Mary E. Keefe, Managing Director, Regulatory Affairs, Nuveen, LLC, to Brent J. Fields, Secretary, Commission, dated May 23, 2018 ("Nuveen Letter").
26. Letter from Hubert De Jesus, Global Head of Market Structure and Electronic Trading, and Joanne Medero, U.S. Head of Global Public Policy, BlackRock, Inc., to Brent J. Fields, Secretary, Commission, dated May 23, 2018 ("BlackRock Letter").
27. Letter from Frank L. Jobert, Jr., Executive Director, Louisiana Trustee Education Council, to Brent J. Fields, Secretary, Commission, dated May 23, 2018 ("LATEC Letter").
28. Letter from Joanna Mallers, Secretary, FIA Principal Traders Group, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("FIA Letter").
29. Letter from Theodore R. Lazo, Managing Director & Associate General Counsel, Securities Industry and Financial Markets Association, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("SIFMA Letter").
30. Letter from Patrick J. Healy, Founder & CEO, Issuer Network, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("Issuer Network Letter I").
31. Letter from Linda M. Giordano, Co-Founder & CEO, and Jeffrey M. Alexander, Co-Founder & President, Babelfish Analytics, Inc., to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("Babelfish Letter").
32. Letter from Dennis M. Kelleher, President & CEO, et al., Better Markets, Inc., to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("Better Markets Letter").
33. Letter from Rich Steiner, Electronic Trading Strategist, RBC Capital Markets, to Brent Fields, Secretary, Commission, dated May 24, 2018 ("RBC Letter I").
34. Letter from William H. Hebert, Managing Director, Financial Information Forum, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("FIF Letter").
35. Letter from Paul M. Russo, Managing Director, Goldman Sachs & Co. LLC, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("Goldman Sachs Letter").
36. Letter from Tyler Gellach, Executive Director, Healthy Markets Association, to Brent J. Fields, Secretary, Commission, dated May 24, 2018 ("Healthy Markets Letter I").
37. Letter from Jason Clague, Executive Vice President, Operational Services, Charles Schwab & Co., Inc., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Schwab Letter").
38. Letter from Joseph Brennan, Principal & Global Head of Equity Investment Group, Vanguard, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Vanguard Letter").
39. Letter from Marc R. Bryant, Deputy General Counsel, Fidelity Investments, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Fidelity Letter").
40. Letter from Stephen John Berger, Managing Director, Government & Regulatory Policy, Citadel Securities, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Citadel Letter").
41. Letter from Kevin Croun, Global Head of Trading, Invesco Ltd., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Invesco Letter").
42. Letter from Micah Hauptman, Financial Services Counsel, Consumer Federation of America, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("CFA Letter").
43. Letter from Heidi W. Hardin, General Counsel, MFS Investment Management, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("MFS Letter").
44. Letter from Timothy J. Coyne, Global Head of ETF Capital Markets, and Nathaniel N. Evarts, Head of Trading, Americas, State Street Global Advisors, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("State Street Letter").
45. Letter from Dennis Simmons, Executive Director, Committee on Investment of Employee Benefit Access, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("CIEBA Letter").
46. Letter from Lisa Mahon Lynch, Director, Trading & Counterparty Services, Wellington Management Company L.P., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Wellsington Letter").
47. Letter from Kevin Duggan, Managing Director, Execution & Treasury, Capital Markets, Ontario Teachers' Pension Plan, et al., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Joint Pension Plan Letter").
48. Letter from Tim Gately, Managing Director, Head of Americas Equities, Citigroup Global Markets Inc., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Citigroup Letter").
49. Letter from Michael Jacejko, Birch Bay Capital, LLC, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Birch Bay Letter").
50. Letter from Cynthia Lo Bessette, General Counsel & Executive Vice President, OFI Global Asset Management, Inc., et al., OppenheimerFunds, Inc., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Oppenheimer Letter").
51. Letter from Ray Ross, Chief Technology Officer, Clearpool Group, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Clearpool Letter").
52. Letter from James J. Angel, Associate Professor of Finance, Georgetown University, McDonough School of Business, to Commissioner, dated May 25, 2018 ("Angel Letter I").
53. Letter from Chester Spatt, Former Chief Economist, Commission, to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Spatt Letter").
54. Letter from Joseph Kinahan, Managing Director, Client Advocacy & Market Structure, TD Ameritrade, Inc., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("TD Ameritrade Letter").
55. Letter from Edward S. Knight, Executive Vice President & Global Chief Legal & Policy Officer, Nasdaq, Inc., to Brent J. Fields, Secretary, Commission, dated May 25, 2018 ("Nasdaq Letter I").
56. Letter from Edward T. Tilly, Chairman & Chief Executive Officer, 1062 The Commission notes that it separately received a copy of a signature page already attached to this letter from Karl Polen, Chief Investment Officer, Arizona State Retirement System, dated May 21, 2019. For purposes of this summary, the copy has not been counted as a separate letter or comment.
84. Letter from Thomas R. Kubera, Chief Accounting Officer & Interim Chief Financial Officer, SIFCO Industries, Inc., to Brent J. Fields, Secretary, Commission, dated June 21, 2018 ("SIFCO Letter").

85. Letter from Michael R. Peterson, Vice President, Corporate Secretary, & Associate General Counsel, to Brent J. Fields, Secretary, Commission, dated June 22, 2018 ("Ennis Letter").

86. Letter from Steven C. Richter, President, John M. Freeman, Executive Vice President, Chief Legal Officer & Corporate Secretary, to Brent J. Fields, Secretary, Commission, dated June 22, 2018.

87. Letter from John J. Manning, Vice President, General Counsel & Secretary, Sensient Technologies Corporation, to Brent J. Fields, Secretary, Commission, dated June 25, 2018 ("Sensient Letter").

88. Letter from John Christofilos, Senior Vice-President & Chief Trading Officer, AGF Investments Inc., to Brent J. Fields, Secretary, Commission, dated June 25, 2018 ("AGF Letter").

89. Letter from Dean Shimamura, Vice Chairman & Chief Financial Officer, Bank of Hawaii Corporation, to Brent J. Fields, Secretary,
93. Letter from Jerry Fowden, Chief Executive Officer, Cott Corporation, to Brent J. Fields, Secretary, Commission, dated June 26, 2018 ("Cott Letter").

94. Letter from Adam F. Wergeles, EVP & General Counsel, Leaf Group Ltd., to Brent J. Fields, Secretary, Commission, dated June 26, 2018 ("Leaf Group Letter").

95. Letter from Haim Bodek, Managing Principal, and Stanislav Dolgopolov, Chief Regulatory Officer, Decimus Capital Markets, LLC, to Brent J. Fields, Secretary, Commission, dated June 26, 2018 ("Decimus Letter").

96. Letter from Michael Sherman, Senior Vice President & General Counsel, Genesis Healthcare, Inc., to Brent J. Fields, Secretary, Commission, dated June 26, 2018 ("Genesis Letter").


98. Letter from Michael J. Schewel, Vice President, General Counsel & Secretary, Tredegar Corporation, to Brent J. Fields, Secretary, Commission, dated June 27, 2018 ("Tredegar Letter").

99. Letter from Nicholas C. Taylor, Chairman & CEO, Mexco Energy Corporation, to Brent J. Fields, Secretary, Commission, dated June 27, 2018 ("Mexco Letter").

100. Letter from John Ramsey, Chief Market Policy Officer, Investors Exchange LLC, to Brent J. Fields, Secretary, Commission, dated June 27, 2018 ("IX Exchange Letter").

101. Presentation from Security Traders Association to Commission, dated June 28, 2018 ("STA Presentation").

102. Letter from Timothy W. Gorman, Executive Vice President & Chief Financial Officer, Energizer Holdings, Inc., to Brent J. Fields, Secretary, Commission, dated June 28, 2018 ("Energizer Letter").

103. Letter from Christopher A. Iacovella, Chief Executive Officer, American Securities Association, to Brent J. Fields, Secretary, Commission, dated June 28, 2018 ("ASA Letter").

104. Letter from W. Stancil Starnes, Chairman, President & Chief Executive Officer, ProAssurance Corporation, to Brent J. Fields, Secretary, Commission, dated June 29, 2018 ("ProAssurance Letter").

105. Letter from Isabel Janci, Vice President, Investor Relations, The Home Depot, to Brent J. Field[s], Secretary, Commission, dated June 29, 2018 ("Home Depot Letter").

106. Letter from Eric P. Sils, CEO & President, Standard Motor Products, Inc., to Brent J. Fields, Secretary, Commission, dated July 2, 2018 ("SMP Letter").

107. Letter from Christopher T. Weber, Executive Vice President & Chief Financial Officer, Halliburton, to Brent J. Fields, Secretary, Commission, dated July 2, 2018 ("Halliburton Letter").

108. Letter from Jennifer D. Whalen, Senior Vice President & Chief Financial Officer, Era Group Inc., to Brent J. Fields, Secretary, Commission, dated July 2, 2018 ("Era Letter").

109. Letter from David M. Weisberger, Head of Equities, ViableMkts, to Brent J. Fields, Secretary, Commission, dated July 2, 2018 ("ViableMkts Letter").

110. Letter from John S. Fischer, General Counsel, Natural Grocers by Vitamin Cottage, Inc., to Brent J. Fields, Secretary, Commission, dated July 3, 2018 ("Natural Grocers Letter").

111. Letter from Mark J. Airola, Senior Vice President, General Counsel, Chief Administrative Officer & Corporate Secretary, Newpark Resources, Inc., to Brent J. Fields, Secretary, Commission, dated July 3, 2018 ("Newpark Letter").

112. Letter from Jenny H. Parker, Senior Vice President—Finance, Secretary & Treasurer, Haverty Furniture Companies, Inc., to Brent J. Fields, Secretary, Commission, dated July 3, 2018 ("Haverty Letter").

113. Letter from Adam W. Miller, Chief Financial Officer & Treasurer, Knight-Swift Transportation Holdings Inc., to Brent J. Fields, Secretary, Commission, dated July 5, 2018 ("Knight-Swift Letter").

114. Letter from Tyler Gellasch, Executive Director, HealthyMarkets Association, to Brent J. Fields, Secretary, Commission, dated July 6, 2018 ("HealthyMarkets Letter II").

115. Letter from R. Dale Lynch, Executive Vice President—Chief Financial Officer, Federal Agricultural Mortgage Corporation, to Brent J. Fields, Secretary, Commission, dated July 9, 2018 ("Farmer Mac Letter").

116. Letter from Elizabeth K. King, General Counsel & Corporate Secretary, New York Stock Exchange, to Brent J. Fields, Secretary, Commission, dated July 10, 2018 ("NYSE Letter II").

117. Letter from "Danny Mulson" to Commission, dated July 10, 2018 ("Mulson Letter II").

118. Letter from Maria Trainor, Vice President, General Counsel & Secretary, Ampco-Pittsburgh Corporation, to Brent J. Fields, Secretary, Commission, dated July 11, 2018 ("Ampco-Pittsburgh Letter").

119. Letter from Ted A. Dosch, Executive Vice President—Finance & Chief Financial Officer, Anixter International Inc., to Brent J. Fields, Secretary, Commission, dated July 13, 2018 ("Anixter Letter").

120. Letter from John K. Lines, EVP/Secretary & General Counsel, National HealthCare Corporation, to Brent J. Fields, Secretary, Commission, dated July 16, 2018 ("NHC Letter").

121. E-mail from Patrick Healy, Founder & CEO, Issuer Network, to David Shillman, Commission, dated July 17, 2018 ("Issuer Network E-mail").

122. Letter from R. Scott Mahoney, Senior Vice President—General Counsel & Secretary, AVANGRID, Inc., to Brent J. Fields, Secretary, Commission, dated July 18, 2018 ("Avangrid Letter").

123. Letter from J.A. to Brent J. Fields, Secretary, Commission, dated July 19, 2018 ("JA Letter II").

124. Letter from Ruairidh Ross, Deputy General Counsel & Assistant Secretary, HP Inc., to Brent J. Fields, Secretary, Commission, dated July 31, 2018 ("HP Letter").

125. Letter from Glenn E. Tynan, Vice President & Chief Financial Officer, Curtiss-Wright Corporation, to Brent J. Fields, Secretary, Commission, dated August 3, 2018 ("Curtiss-Wright Letter").

126. Letter from James J. Angel, Associate Professor of Finance, Georgetown University, McDonough School of Business, to Commission, dated August 3, 2018 ("Angle Letter II").

127. Letter from John Ramsey, Chief Market Policy Officer, Investors Exchange LLC, to Brent J. Fields, Secretary, Commission, dated August 8, 2018 ("TEX Letter III").

128. Letter from Fiona Reynolds, Chief Executive Officer, Principles for Responsible Investment, to Brent J. Fields, Secretary, Commission, dated August 15, 2018 ("PRI Letter").

129. Letter from Walter K. Compton, Executive Vice President & General Counsel, Murphy Oil Corporation, to Brent J. Fields, Secretary,
<table>
<thead>
<tr>
<th>Concept</th>
<th>Element</th>
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<th>Monthly</th>
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<td>A required unique code to identify each exchange in the Transaction Fee Pilot.</td>
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<td>Record Type</td>
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<td>Text S or M</td>
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<td>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).</td>
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<tr>
<td>Participant Type</td>
<td>plctpt</td>
<td>MM, Other or Blank</td>
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<td>O</td>
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<td>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.</td>
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<td>Pilot Group</td>
<td>grp</td>
<td>1, 2, or C</td>
<td>R</td>
<td>R</td>
<td></td>
<td>A required indicator that identifies the test or control group during the Pilot and post-Pilot Period. 1, 2—Test Groups 1, 2; C—Control group.</td>
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The following Exhibit 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 17 CFR 242.610T(e) and the logical representation of those disclosures to a corresponding XML element. The Commission’s XML schema is the formal electronic representation of this data model.

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<th>Element</th>
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<tr>
<td>Exchange</td>
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<td>Non-empty</td>
<td>R</td>
<td>R</td>
<td></td>
<td>A required unique code to identify each exchange in the Transaction Fee Pilot.</td>
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<td>Record Type</td>
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<td>Text S or M</td>
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<td>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).</td>
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<td>Participant Type</td>
<td>plctpt</td>
<td>MM, Other or Blank</td>
<td>O</td>
<td>O</td>
<td>Blank</td>
<td>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.</td>
</tr>
<tr>
<td>Pilot Group</td>
<td>grp</td>
<td>1, 2, or C</td>
<td>R</td>
<td>R</td>
<td></td>
<td>A required indicator that identifies the test or control group during the Pilot and post-Pilot Period. 1, 2—Test Groups 1, 2; C—Control group.</td>
</tr>
<tr>
<td>Concept</td>
<td>Element</td>
<td>Type</td>
<td>Spot</td>
<td>Monthly</td>
<td>When absent</td>
<td>Definition</td>
</tr>
<tr>
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<td>-------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Displayed</td>
<td>disp</td>
<td>D, N, or B</td>
<td>R</td>
<td>R</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Top/Depth</td>
<td>topOrDepth</td>
<td>T, D, or B</td>
<td>R</td>
<td>R</td>
<td></td>
<td>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.</td>
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<td>Start Date</td>
<td>start</td>
<td>YYYY-MM-DD</td>
<td>R</td>
<td>O</td>
<td></td>
<td>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.</td>
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<tr>
<td>End Date</td>
<td>end</td>
<td>YYYY-MM-DD or Blank</td>
<td>O</td>
<td>O</td>
<td>Blank</td>
<td>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.</td>
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<tr>
<td>Month and Year.</td>
<td>YearMonth</td>
<td>YYYY-MM</td>
<td>NA</td>
<td>R</td>
<td></td>
<td>The year and month of the monthly realized reported average and median per share fees. 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.</td>
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<tr>
<td>Pre/Post ..</td>
<td>preOrPost</td>
<td>1, 2, or Blank</td>
<td>O</td>
<td>O</td>
<td>Blank</td>
<td>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. 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. 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.</td>
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<td>Base Taker Fee.</td>
<td>baseTakeFee</td>
<td>Number</td>
<td>R</td>
<td>NA</td>
<td></td>
<td>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. 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. 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.</td>
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<td>The Top Tier Taker Fee is the 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. 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.</td>
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<td>avgTakeFee</td>
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<td>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.</td>
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<td>Median Taker Fee.</td>
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<td>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.</td>
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<td>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. The Top Tier Maker 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. 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.</td>
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<td>The Top Tier Maker Fee is the 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. 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.</td>
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<td>Average Maker Fee.</td>
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<td>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.</td>
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<tr>
<td>Concept</td>
<td>Element</td>
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<td>Monthly</td>
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<tr>
<td>Median Maker Fee</td>
<td>medianMakeFee</td>
<td>Number</td>
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<td>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.</td>
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