MEMORANDUM

To: Public Comment File S7-14-16

From: Jill S. Henderson
Counsel to Commissioner Kara M. Stein
U.S. Securities and Exchange Commission

Date: October 31, 2018

Re: Meeting with Representatives from RBC and Others

On October 30, 2018, Commissioner Stein and Jill Henderson (Counsel to Commissioner Stein) met with the following:

- Bobby Grubert, RBC Capital Markets
- Rich Steiner, RBC Capital Markets
- Shawn Maher, Royal Bank of Canada
- Danielle Barrett, Royal Bank of Canada
- Matt Waldner, Columbia Threadneedle Investments
- Mett Kinak, T. Rowe Price
- Craig Hurl, Ontario Teachers Pension Plan
- Mike Buek, The Vanguard Group
- Jeff Estella, MFS
- Jason Vedder, Driehaus Capital Management

Topics discussed include the proposed Rule on Disclosure of Order Handling Information.

Attachment: RBC Capital Markets, *Complexity of Exchange Pricing and Corresponding Challenges to Transparency and Routing* (Oct. 2018)

RBC Capital Markets

Complexity of Exchange Pricing and Corresponding Challenges to Transparency and Routing

October 2018

Overview

Policymakers, market participants, academics, and other stakeholders continue to raise questions about the impact of exchange pricing on complexity, instability, opacity, and conflicts of interest in U.S. equity markets.[1] In response to these questions, we analyzed publicly available fee and rebate schedules at the exchanges where listed securities are publicly traded.[2] Our findings suggest that these fee and rebate schedules, although publicly available, provide insufficient information to fully determine the economics of a given trade at the time of execution. When compiled in aggregate, exchange pricing becomes highly complex. Over time, both the volume of fee and rebate schedules and the frequency with which they are changed add even more complexity to U.S. equity markets – far more complexity than is commonly understood. In all, the data identifies no fewer than 1,023 pricing "paths" across these exchanges.[3] That's an increase of almost 22 percent from the 839 pricing paths we observed in our initial report in February of 2016.[4] We also note that 381 of the paths in our current study, or 37 percent, consist of rebates. In total, we found at least 3,762 separate pricing variables across the exchanges – that is, 3,762 factors that ultimately determine the fees charged and rebates offered by exchanges. These 3,762 variables strongly suggest that exchange prices are tailored and offered on a bespoke basis.

We infer from the data in this study that the proliferation of equity exchange pricing variables contributes to a number of negative incentives and outcomes on these venues. These outcomes include reduced transparency, increased complexity, and heightened conflicts of interest between brokers and clients with regard to routing of client orders. Additionally, pricing changes, which require technology adjustments by exchanges and trading firms, can elevate operational risks that could cause market "glitches" and other risks to market stability.

To mitigate these negative incentives and outcomes, policymakers should consider reforms that instead incentivize greater transparency, stability, and alignment of interests among brokers and clients. These reforms should include:

1. Capping or Eliminating Rebates. Capping or eliminating rebates would reduce exchange incentives to structure order types and pricing tiers in ways that encourage complexity, fragmentation, instability, lack of transparency, and broker conflicts, and instead incentivize greater price transparency, market stability, efficiency, and best execution. Numerous market participants and other interested stakeholders, including RBC, have called for a pilot study that, for a limited period, and for a sample of the most actively traded stocks, would eliminate rebates and other inducements to trade on a particular venue.[5] More recently, the SEC has proposed a Transaction Fee Pilot[6] that would, among other things, designate a group of stocks which would not be eligible for rebates from any exchange. Such a study would generate useful data for policymakers to determine any appropriate reforms of "maker-taker" pricing.

2. Providing Additional Public Transparency of Exchange Fee Changes and Order Routing. Requiring improved disclosures with respect to fee changes, other pricing variables, and order routing – including for institutional as well as individual orders – will provide greater information to market participants regarding trading activity and in so doing incentivize best execution. The SEC's proposed rule on enhanced disclosure of order handling information[7], if finalized substantially as proposed, will help to advance these valuable objectives by requiring broker-dealers to disclose specific data related to the routing and execution of institutional orders and enhance existing disclosure

requirements related to the routing of retail orders, including average net execution fee or rebate for shares of orders providing or removing liquidity.

Regulation NMS

With the adoption of Regulation NMS, policymakers sought to increase competition among trading venues and provide investors and issuers with a more optimal secondary market to meet their needs. A simplified view of today's protected equities markets' fee and rebate pricing schedule is depicted in Figure 1.

Figure 1: Exchange Fee Schedules*

Exchange	Post	Take
NYSE NATIONAL	20	-20
CBOE BYX	19	-17
NASDAQ BX	18	-15
CBOE EDGA	8	-4
IEX	3	3
NYSE AMERICAN	0	2
CBOE EDGX	-20	30
CBOE BZX	-25	30
CHX	-20	30
NYSE	-22	28
NASDAQ PSX	-30	28
NASDAQ	-31	30
NYSE ARCA	-31	30

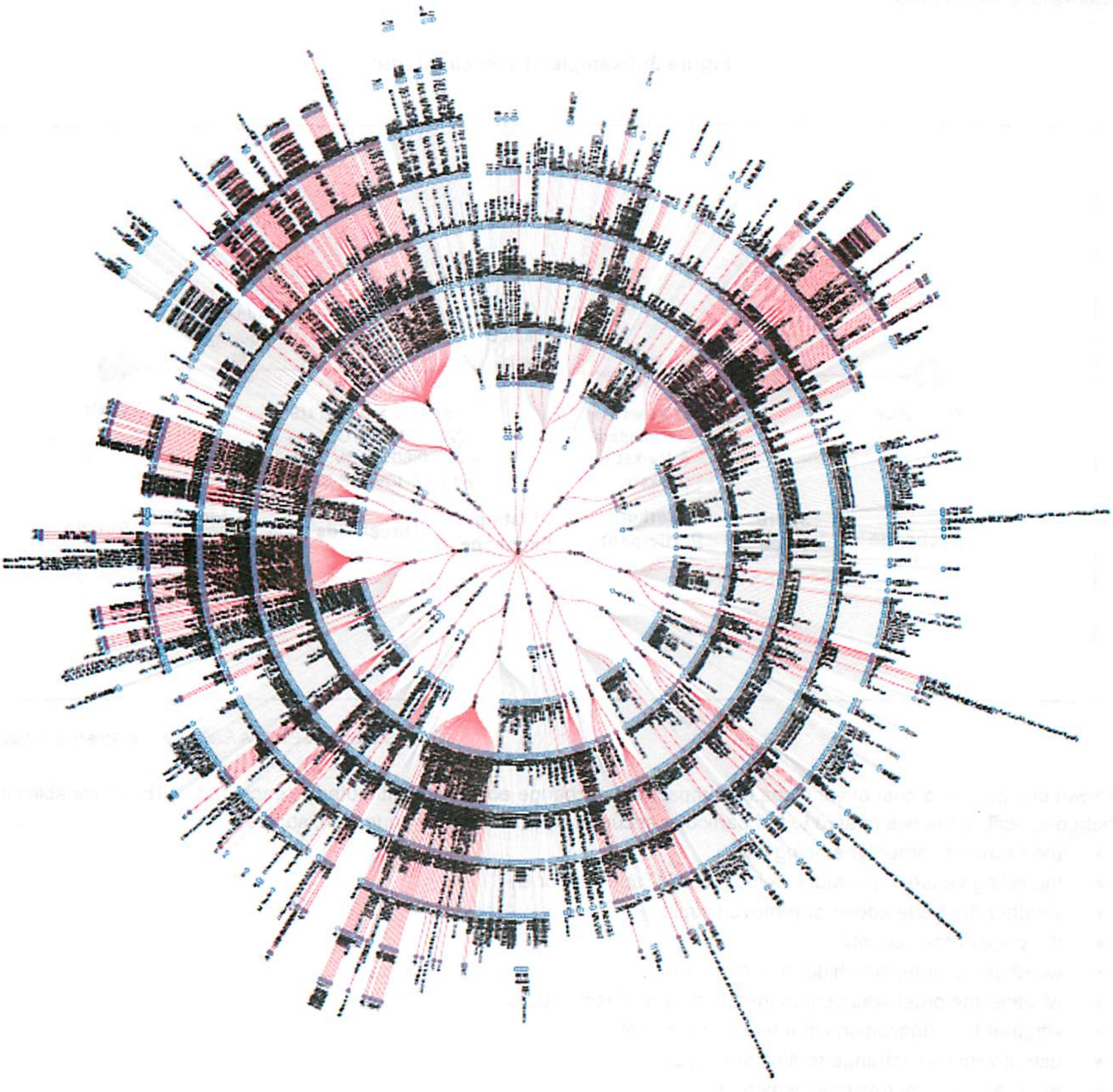
Negative number indicates a rebate
Note; Prices in cents per 100 shares (mils per share)
** Source: U.S. Exchange Fee Schedules, August 2018*

Such information is commonly used in an effort to illustrate the relative costs of trading on various exchanges. However, a more accurate picture of the pricing fee and rebate structure, after taking tiers and other factors into account, bears little resemblance to this relatively simple chart.

Current Pricing and Routing Tiers and Schedules

After careful review of fee and rebate documentation made public by the exchanges, we compiled a visual representation of the exchanges' fee and rebate schedules. The diagram shown in Figure 2 consists of a more complete illustration of the exchanges' trading and routing fee / rebate schedules, inclusive of tiers and other variables. It should be emphasized that even this image, as complex as it is, remains a simplification; the reality is even more complex due to differences in the fee methodologies used by exchanges and unique considerations such as stock-specific segregations and pilot programs.

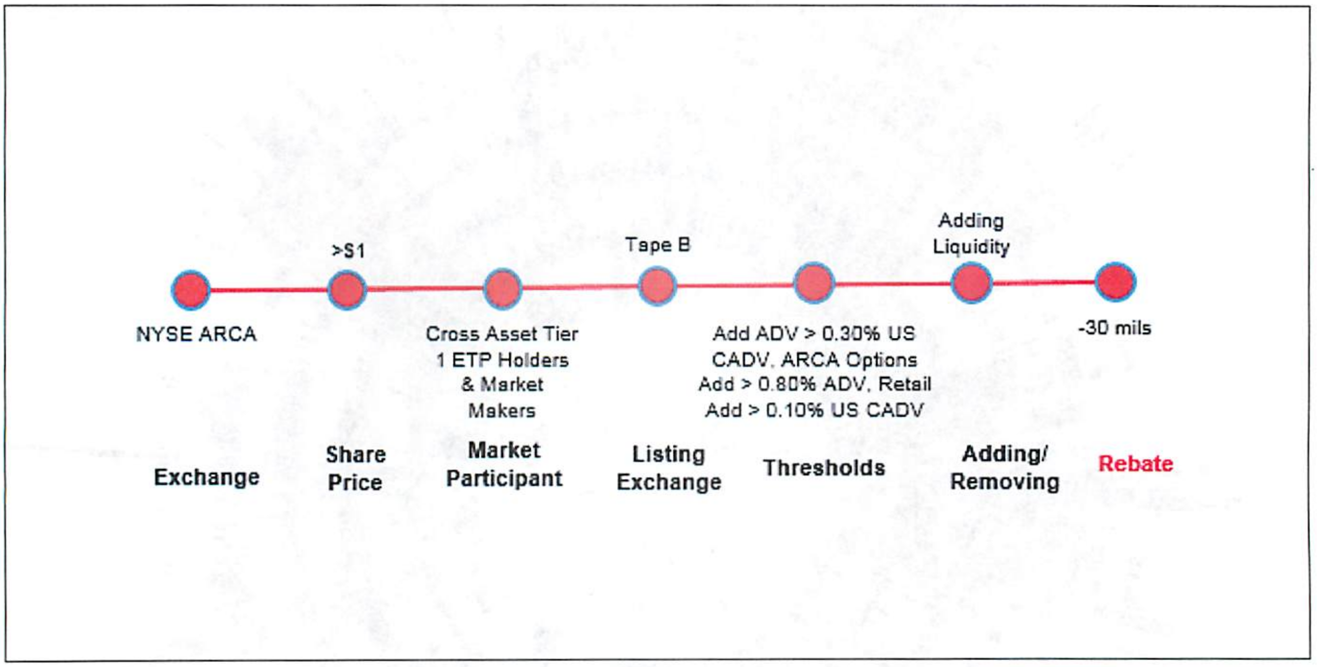
Figure 2: Exchange Fees & Rebates*



**Red (blue) indicates rebate (fee)*
Source: U.S. Exchange Fee Schedules, August 2018

Exchanges take unique approaches to define and organize their trading-related fees and rebates. In order to facilitate a unified comparison we created a data structure with a hierarchy of factors that helps capture this diversity. As depicted in Figure 3, this structure allowed us to generate pricing "paths" that start with the exchange, traverse a hierarchy of variables that – individually and in combination -- affect price, and ultimately arrive at a fee or rebate. The aggregation of all the paths that reflect the exchanges' fee / rebate schedules is depicted in Figure 2. Expressed simply, a trade on an exchange takes one of these paths to determine its economics.

Figure 3: Example of a Pricing Path*



**Source: NYSE ARCA Exchange Fee Schedule, August 2018*

As shown in Figure 4, a host of variables can impact the exchange economics attributed to each trade. These variables include exchange-specific variables related to the particular security, order and trade in question, such as:

- the exchange order type being used
- the listing venue of the stock being traded (Tape A, B or C)
- whether the trade added or removed liquidity
- the price of the security
- whether the order was hidden or displayed
- whether the order was sent to the opening or closing auction
- whether IOIs (Indications of Interest) were sent
- use of various exchange routing strategies
- whether price improvement was received
- whether the order was a retail order

Additionally, pricing paths are often determined by yet other variables consisting of a member firm's activity, such as:

- traded volume
- added volume
- volume at certain times of the trading day
- volume realized via non-displayed orders
- number of options contracts traded on an affiliated venue

Figure 4: Examples of Pricing Variables and Corresponding Fees/ Rebates *

Description	Fee/Rebate
"The Exchange currently offers nine Add Volume Tiers under footnote 4, which provide enhanced rebates ranging from of $0.0025 to $0.0032 per share for qualifying orders which yield fee codes B, V, Y, 3 and 4. The Exchange proposes to modify the criteria necessary to achieve the Investor Depth Tier as described below. Currently, under the Investor Depth Tier a Member may be provided an enhanced rebate of $0.0033 per share where that Member: (i) adds an ADV greater than or equal to 0.15% of the TCV; (ii) has an "added liquidity" as a percentage of "added plus removed liquidity" greater than or equal to 85%; and (iii) adds an ADV greater than or equal to 400,000 shares as non-displayed orders that yield fee code HA, HI, and/or MM. As amended, under the Investor Depth Tier a Member may be provided an enhanced rebate of $0.0033 per share where that Member: (i) adds an ADV greater than or equal to 0.12% of the TCV; (ii) has an "added liquidity" as a percentage of "added plus removed liquidity" greater than or equal to 85%; and (iii) adds an ADV greater than or equal to 400,000 shares as non-displayed orders that yield fee code HA, HI, and/or MM."	-33
"The Exchange is proposing to amend the criteria required to qualify for a $0.0030 per share executed credit, which will apply to securities of all three Tapes under Rules 7018(a)(1) – (3). Currently, the Exchange provides the credit if a member has shares of liquidity provided in all securities through one or more of its Nasdaq Market Center MPIDs that represent 0.575% or more of Consolidated Volume4 during the month, including shares of liquidity provided with respect to securities that are listed on exchanges other than Nasdaq or NYSE that represent 0.10% or more of Consolidated Volume. The Exchange is proposing to increase the level of shares of liquidity required to be provided in all securities through one or more of its [sic] Nasdaq Market Center MPIDs from 0.575% to 0.625% or more of Consolidated Volume during the month. The Exchange is also proposing to increase the required level of shares of liquidity provided from 0.10% to 0.15% or more of Consolidated Volume with respect to securities that are listed on exchanges other than Nasdaq or NYSE."	-30
"As proposed, member organizations that meet the current requirements for the Non-Tier Adding Credit, Tier 3 Adding Credit, and Tier 4 Adding Credit on Tape A would be eligible to receive an additional $0.0001 per share if the member organization adds liquidity, excluding liquidity added as an SLP, in UTP Securities of at least 0.20% 3 of Tape B and Tape C consolidated average daily volume ('CADV) combined. "Similarly, SLPs that (1) meet the current requirements for SLP Tier 3, SLP Tier 2 and SLP Tier 1A credits, and (2) add liquidity in UTP Securities of at least 0.30% of Tape B and Tape C CADV combined, would be eligible for an additional $0.0001 per share in securities with a per share price of $1.00 or more that meet the 10% average or more quoting requirement in an assigned security pursuant to Rule 107B (quotes of an SLP-Prop and an SLMM of the same member organization would not be aggregated)."	-1
"Tier 2 Adding Credit – Equity per Share Credit – per transaction – for all orders, other than MPL and Non-Display Reserve orders that add liquidity to the NYSE if the Member Organization (i) has Adding ADV that is at least 0.75% of NYSE CADV, and (ii) executes MOC and LOC orders of at least 0.10% of NYSE CADV or executes an ADV during the billing month of at least one million shares in Retail Price Improvements Orders. Member organizations that meet the above requirements and add liquidity, excluding liquidity added as an Supplemental Liquidity Provider, in securities traded pursuant to Unlisted Trading Privileges (Tapes B and C) on the Pillar Trading Platform of at least 0.20% of Tape B and Tape C CADV combined will receive an additional $0.00005 per share."	-20

** Source: U.S. Exchange Fee Schedules, September 2018*

These variables are usually measured in both absolute and proportional benchmark terms and are typically calculated monthly and therefore remain unknown in real time and even at the end of most trading days. The timing and method of these measurements introduce incentives for brokers to alter their aggregate routing behavior as the end of each month (or other reporting period) approaches in order to satisfy variables that correspond to specific tiers and, ultimately, pricing paths – possibly contrary to best execution considerations.

Our analysis identifies at least 1,023 pricing paths across the exchanges. Over one-third, or 381, of these paths consist of rebates. These 1,023 pricing paths are themselves determined by at least 3,762 pricing variables. Due to the diversity of fees and rebates, there are dozens of unique price points for which each security could qualify based on its listing venue. This fact implies that trades, net of fees and rebates, occur in a broad range of price points around the actual trade price. Since these *net* prices are opaque, these pricing and routing variables dilute the value of the quote and trade information made available by the exchanges.

Based on the data analyzed in this report, we infer that competition for order flow among the exchanges has driven the proliferation of complexity over the past decade. Many tiers created by the exchanges suggest a logical motivation to incentivize volume. Moreover, in certain instances highly specific descriptions and tightly focused combinations of variables incorporated into pricing paths suggest that these paths may have come into being in connection with a few exchange clients – if not a single exchange client. While we cannot objectively validate this inference, we would emphasize that even the appearance of pricing tailored to specific exchange clients can itself undermine perceptions of marketplace fairness.

Complexity of Pricing

Compounding the complexity of pricing tiers is the frequency with which exchanges undertake fee schedule changes. At the extreme, exchanges can announce omnibus changes to their fee schedules – impacting existing tiers, creating new ones and eliminating others. Under the Exchange Act of 1934, the SEC has the authority to deem fee schedule filings as immediately effective pending further review. Of note, we are unaware of any such fee proposals that were rejected during between 2012 and August 2018 period.

Further, these fee schedule changes by their own terms appear to be explicitly intended to incentivize order flow. Consider these excerpts from actual fee schedule filings made by exchanges:[8]

- "This increase is also reflective of the Exchange's desire to provide incentives to attract order flow to the Exchange in return for significant market-improving behavior."
- "The Exchange believes that the proposal to introduce a new SLP Tier 4 is reasonable because it provides SLPs as well as SLPs that are also DMMs with an additional way to qualify for a rebate, thereby providing SLPs with greater flexibility and creating an added incentive for SLPs to bring additional order flow to a public market."
- "The purpose of the proposed rule change is to introduce a new pricing model to keep pace with an evolving practice."
- "The Exchange believes it is reasonable to add the proposed Retail Order Step-Up Tier 2 because the Exchange believes it would encourage participation from a greater number of ETP Holders, which would promote additional liquidity in Retail Orders."
- "The proposed fee will encourage the submission of additional liquidity to a national securities exchange, thereby promoting price discovery and transparency and enhancing order execution opportunities for member organizations from the substantial amounts of liquidity that are present on the Exchange during the opening."

Impact on Institutional and Retail Clients and on U.S. Equity Markets as a Whole

The bespoke nature of pricing paths on exchanges have effects that are arguably problematic for both institutional and retail clients, as well as for the orderly functioning of the U.S. equity markets as a whole. As the exchange pricing landscape has become more fragmented, transaction pricing has become a key differentiator in how equity markets operate. We believe the complex and bespoke nature of pricing that we have described in this study impedes the ability of institutional and retail investors to judge how their orders are being handled.

In summary, the proliferation of pricing paths contributes to a number of negative incentives and outcomes on these exchanges, including:

- Opacity. Many trades are priced using one or more variables that, while perhaps publicly available, are not readily apparent from the listed price of the exchange.
- Instability. Pricing changes require technology adjustments by exchanges and trading firms, which can elevate operational risks for exchanges and trading firms, leading to market "glitches" and other risks to market stability.
- Fragmentation. A not insignificant volume of trades evidently are being placed based on variables that have little if any relevance to cost-effectiveness and best execution.
- Conflicts of interest. Trades are routed to exchanges where rebates and other inducements may be offered to the benefit of the broker, but not necessarily resulting in best execution for the client.

Policy Recommendations

To mitigate or eliminate these negative incentives and outcomes, policymakers should consider reforms that encourage transparency, stability, efficiency, and alignment of interests among brokers and clients. These reforms should include:

1. Capping or Eliminating Rebates

   Capping or eliminating rebates would reduce exchange incentives to structure order types and pricing tiers in ways that encourage complexity, fragmentation, instability, lack of transparency, and broker conflicts and instead incentivize greater price transparency, market stability, efficiency, and best execution. Numerous market participants and other interested stakeholders, including RBC, have called for a pilot study that, for a limited period, and for a sample of the most liquid stocks, would eliminate rebates and other inducements to trade on a particular venue for a sample of the most liquid stocks. Such a study would generate useful data for policymakers to determine the most appropriate reforms of "maker-taker" pricing. The SEC's proposed transaction fee pilot study, released in March 2018[9] will test the impact of prohibiting rebates for liquid issuances on execution quality.

2. Providing Additional Public Transparency of Exchange Fee Changes and Order Routing

   Requiring improved disclosures with respect to fee changes, other pricing variables, and order routing – including for institutional as well as individual orders – will provide greater information to market participants regarding trading activity and in so doing incentivize best execution. The SEC's proposed rule on enhanced disclosure of order handling information, if finalized substantially as proposed, will help to advance these valuable objectives.[10]

End Notes

[1] SEC Commissioner Robert J. Jackson Jr., Remarks on "Unfair Exchange: The State of America's Stock Markets", 19 September 2018, <https://www.sec.gov/news/speech/jackson-unfair-exchange-state-americas-stock-markets>, ("I want to highlight four puzzling practices in today's markets—the two-tiered system for stock-price information, legal limits on exchange liability when they harm investors, the structure of stock exchanges themselves, and payments exchanges make to brokers who send orders their way—that don't look like the kind of competition that American investors deserve.
It is time for the Commission to have a market-wide conversation about how exchanges make their rules and prices. Exchanges filed more than 1,500 rule-related requests with the SEC in 2017, hundreds related to trading fees, data fees, and order types alone ")

RBC Capital Markets, Comment Letter on the Proposed Rule to Establish a Transaction Fee Pilot for National Market System Stocks, File No. S7-05-18, 24 May 2018, <https://www.sec.gov/comments/s7-05-18/s70518-3711236-162472.pdf>, ("In particular, we believe that the Proposal will provide valuable data to the Commission to determine the extent to which the current practice of 'maker-taker' pricing is contributing to price opacity, market complexity, and conflicts of interest between brokers and clients, and thereby help the Commission to ensure that U.S. equity markets are more transparent, efficient, and fair for all investors.")

T. Rowe Price, Comment Letter on the Proposed Rule to Establish a Transaction Fee Pilot for National Market System Stocks, File No. S7-05-18, 24 May 2018, <https://www.sec.gov/comments/s7-05-18/s70518-3832746-162769.pdf>, ("Our concerns around rebates, and therefore the outcomes and affected behavior from Test Group 3, are centered on excessive intermediation (which is especially present in the most liquid traded instruments), complexity, and a market that is skewed sharply toward benefiting short-term intermediaries at the expense of long-term investors.")

SEC Chairman Jay Clayton, Opening Statement on Proposed Rule to Conduct a Transaction Fee Pilot in National Market System Stocks, 14 March 2018, <https://www.sec.gov/news/public-statement/statement-clayton-open-meeting-nms-2018-03-14>, ("…[W]e do not currently have data to help us meaningfully analyze the effects of exchange fees and rebates on order routing behavior, execution quality, and our market structure generally. I believe that the pilot proposal that the staff is presenting today would help us address this data gap. In my view, the proposed pilot, if adopted, would lead to a more thorough understanding of these issues, which would help the Commission make more informed and effective policy decisions in the future, all to the benefit of retail investors. I note also that experts from a range of viewpoints—including the Equity Market Structure Advisory Committee—have urged the Commission to conduct a pilot to gather market-wide data to help answer many of these questions.")

SEC Commissioner Hester M. Peirce, Opening Statement on Proposed Rule to Conduct a Transaction Fee Pilot in National Market System Stocks, 14 March 2018, <https://www.sec.gov/news/public-statement/statement-peirce-open-meeting-nms-2018-03-14>, ("[W]e find ourselves here today considering a pilot to identify whether broker-dealers, following incentives created by exchanges, which in turn are responding to incentives created by our rules, are making order routing decisions that benefit broker-dealers at the expense of their best execution obligations to their customers.")

SEC Commissioner Kara M. Stein, Opening Statement on Proposed Rule to Conduct a Transaction Fee Pilot in National Market System Stocks, 14 March 2018, <https://www.sec.gov/news/public-statement/statement-stein-open-meeting-nms-2018-03-14>, ("For some time, exchanges have compensated brokers with rebates. These rebates are based upon the type and volume of the broker's customers' orders that are directed to the exchange. For at least the last ten years, market participants have vigorously debated rebates and whether they have resulted in perverse incentives that may harm the quality and efficiency of trading. Many have also argued that the variety of rebates offered by exchanges has contributed to order type complexity. And this, in turn, has led to greater market complexity and increased fragmentation.")
("I am pleased that the proposal contains a stratification of rebates along with a "no rebate" bucket.")
("The central question that we hope will be answered is how do changes in rebates affect the quality and efficacy of an investor's order? The data from this study should inform our ultimate goal of improving market quality and the investor experience.")

Richard G. Ketchum, CEO, FINRA, Remarks on "Essential Elements of Sound Capital Market Structure", Exchequer Club, 17 February 2016, <https://www.finra.org/newsroom/speeches/021716-remarks-exchequer-club>, ("[C]ompetition and regulatory changes have also led to a more complex, fragmented market. In today's increasingly fragmented market, bad actors can consciously disperse their trading activity across markets, asset classes, and broker-dealers in an attempt to hide their footprints and avoid detection.")

SEC Chair Mary Jo White, Statement to Equity Market Structure Advisory Committee Meeting, 15 May 2015, <https://www.sec.gov/spotlight/emsac/emsac-051315-transcript.txt>, ("Complexity can, for example, result in instability if the sophisticated order routing and trading systems necessary to deal with a complex structure do not operate as they are intended to operate. It can create a lack of transparency for investors about how their orders are handled and executed. It can lead to unfair outcomes if professional traders, using the fastest, most sophisticated tools, are able to exploit the complexity in ways that disadvantage investors. Complexity can also make the always-difficult task of regulators in effectively overseeing the markets and enforcing the rules even more difficult.")

Peter Haslag, Olin Business School, Washington University, and Matthew C. Ringgenberg, Olin Business School, Washington University, Paper on "The Causal Impact of Market Fragmentation on Liquidity", 6 April 2015, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2591715>, ("For small stocks, fragmentation causes increased bid-ask spreads, worse price efficiency, and more variability in liquidity. These effects are consistent with models in which exchange competition and fragmentation lead to negative network externalities which reduces liquidity. In particular, several models note that as trading fragments across exchanges, it becomes harder for individual traders to match with a counterparty on a given exchange, which further discourages trading thereby leading to reduced market quality (e.g., Pagano (1989b), Madhavan (1995), Madhavan (2000)).")

Shawn M. O'Donoghue, "The Effect of Maker-Taker Fees on Investor Order Choice and Execution Quality in U.S. Stock Markets", 23 January 2015, <http://people.stern.nyu.edu/jhasbrou/SternMicroMtg/SternMicroMtg2015/Papers/MakerTakerODonoghue.pdf>, ("[M]aker-taker pricing has aggravated agency issues between brokers and their clients. Brokers are incentivized to direct non-marketable limit orders to the venue offering the highest rebate. However, this destination may not necessarily be the best for clients, if it offers a relatively slow execution speed, high nonexecution probability, or a high probability of execution outside-the-quote. Maker-taker pricing has increased the cost to brokers of executing marketable orders in the exchanges; consequently, brokers will internalize uninformed marketable orders whenever possible. As a result, non-marketable limit orders that are sent to the exchange are more likely to execute when the price moves against them since the orders submitted there are disproportionately informed.")

SEC Chair Mary Jo White, Remarks on "Enhancing Our Equity Market Structure", 5 June 2014. <https://www.sec.gov/News/Speech/Detail/Speech/1370542004312>, ("When fees and payments are not passed through from brokers to customers, they can create conflicts of interest and raise serious questions about whether such conflicts can be effectively managed.")

SEC Commissioner Kara M. Stein, Remarks before Trader Forum 2014 Equity Trading Summit, 8 February 2014, <https://www.sec.gov/News/Speech/Detail/Speech/1370540761194#.VPZP8cZhPHg>, ("[W]e should explore how the maker-taker pricing model impacts liquidity and execution quality. Does the current rebate system incentivize or penalize investors? I have heard from many investors, and even exchanges, who are worried about the incentives embedded in the current system, and if there are proposals to explore alternative approaches, we should consider them.")

James J. Angel, Lawrence E. Harris, and Chester S. Spatt, "Equity Trading in the 21st Century", 23 February 2010, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1584026>, ("The make-or-take pricing model thus would appear to accomplish nothing besides reducing quoted spreads and thereby obfuscating true economic spreads, which are the net spreads inclusive of the access fees and liquidity rebates. The obfuscation makes it more difficult for traders to recognize the true costs of their trading.")

[2] BYX: https://markets.cboe.com/us/equities/membership/fee_schedule/byx/
BZX: https://markets.cboe.com/us/equities/membership/fee_schedule/bzx/
CHX: https://www.chx.com/_literature_119763/CHX_Fee_Schedule
EDGA: https://markets.cboe.com/us/equities/membership/fee_schedule/edga/
EDGX: https://markets.cboe.com/us/equities/membership/fee_schedule/edgx/
IEX: https://iextrading.com/trading/fees/
Nasdaq: https://www.nasdaqtrader.com/Trader.aspx?id=PriceListTrading2
Nasdaq BX: https://www.nasdaqtrader.com/Trader.aspx?id=bx_pricing
Nasdaq PSX: https://www.nasdaqtrader.com/Trader.aspx?id=PSX_Pricing
NYSE: https://www.nyse.com/publicdocs/nyse/markets/nyse/NYSE_Price_List.pdf
NYSE American: https://www.nyse.com/publicdocs/nyse/markets/nyse-american/NYSE_America_Equities_Price_List.pdf
NYSE ARCA: https://www.nyse.com/publicdocs/nyse/markets/nyse-arca/NYSE_Arca_Marketplace_Fees.pdf
NYSE National: https://www.nyse.com/publicdocs/nyse/regulation/nyse/NYSE_National_Schedule_of_Fees.pdf

[3] We define an exchange pricing "path" as any net fee or rebate determined by one or more pricing variables as determined by the exchanges, including variables related to a particular security, order, or trade, (e.g., order type, listing venue, security price, whether the order was hidden or displayed, whether the order was sent to the opening or closing auction, whether price improvement was received), as well as variables related to a member firm's activities (e.g., traded volume, added volume, volume at certain times of the trading day, volume realized via non-displayed orders, number of options contracts traded on an affiliated venue), and any other fee or rebate related to external routing noted in an exchange's public fee documentation.

[4] RBC Capital Markets Study on "Complexity of Exchange Pricing and Corresponding Challenges to Transparency and Routing," February 2016, <https://www.rbccm.com/assets/rbccm/docs/us-equities/Complexity%20of%20Exchange%20Pricing%20and%20Corresponding%20Challenges%20to%20Transpare....pdf>

[5] Senator Mark Warner (D-VA) Statement on Proposed SEC Pilot Program Restricting 'Maker-Taker' Pricing Model, 14 March 2018, <https://www.warner.senate.gov/public/index.cfm/2018/3/warner-applauds-proposed-sec-pilot-program-restricting-maker-taker-pricing-model>, ("U.S. Sen. Mark R. Warner (D-VA), Ranking Member of the Senate Banking Subcommittee on Securities, Insurance and Investment, today applauded the Securities and Exchange Commission (SEC)'s announcement of a new pilot program placing restrictions on 'maker-taker' pricing models for stock exchange transaction fees. For years, Sen. Warner and lawmakers from both parties have pressed the SEC to study and reconsider the pricing model, which has been shown to create conflicts of interest that prevent the average investor from receiving the best price on trades. 'This pilot program is an important step towards reforming a broken system and eliminating conflicts of interest that hurt ordinary investors. I am hopeful this study will produce data that will help Congress and the SEC craft needed reforms,' Sen. Warner said. 'I'm glad the SEC has finally acted on the concerns I have been voicing along with my colleagues on this issue for several years.' Since 2014, Sen. Warner has been raising concerns about the 'maker-taker' model. In April 2016, Sen. Warner and Sen. Mike Crapo (R-ID) wrote to the SEC expressing support for a pilot program to study the effects of rebates on U.S. equity markets. In July 2017, Warner wrote to newly-appointed SEC Chairman Jay Clayton and called for '...pursuing the full elimination of [maker-taker] rebates.'")

Senator Mark Warner (D-VA), Nomination Hearing of Jay Clayton to be a Member of the Securities and Exchange Commission, Senate Committee on Banking, Housing, and Urban Affairs, 23 March 2017, <https://www.c-span.org/video/?c4663129/senator-warner-talks-market-structure-issues>, ("One of the things we pushed very hard with the former [SEC] Chair [Mary Jo White] but we've really not seen it, is to move forward on a maker-taker pilot, so that we can try to bring more clarity to make sure that all bidders in the market are going to get a fair shake.")

RBC Capital Markets, Comment Letter on the Equity Market Structure Advisory Committee Recommendation for an Access Fee Pilot, File No. 265-29, 23 September 2016, <https://www.sec.gov/comments/265-29/26529-86.pdf>, ("A $.0002 access fee cap, while reducing the economic incentive of a rebate, does not eliminate that incentive. Given the concerns raised by you and others about the significant negative effects of rebates, it would seem that at least one of the buckets in a pilot study should examine the impact of eliminating rebates and other comparable inducements.")

RBC Capital Markets, Comment Letter on the Equity Market Structure Advisory Committee Recommendation for an Access Fee Pilot, File No. 265-29, 24 May 2016, <https://www.sec.gov/comments/265-29/26529-70.pdf>, ("In the view of many market participants and others, including RBC, rebates – more than access fees – contribute disproportionally to conflicts of interest and other problems in U.S. equity markets. By removing the incentive to route orders to where rebates are highest, conflicts and other problems can be mitigated. A "no-rebate bucket", properly structured and implemented, would allow the Commission to assess the impact of rebates. In addition, any pilot program should ensure that, in lieu of reduced fees and/or no rebates, trading venues do not substitute other inducements to route orders.")

Representative Stephen Lynch (D-MA), Maker-Taker Conflict of Interest Reform Act of 2015, H.R.1216, 114th Congress (2015), <https://www.congress.gov/bill/114th-congress/house-bill/1216/text>, ("This bill directs the Securities and Exchange Commission (SEC) to initiate a six-month pilot program that examines maker-taker pricing (any pricing model by a trading venue that provides rebates, or comparable inducements, or fees to market participants to either provide liquidity to, or take liquidity from, that trading venue).")

Greg Mills, Head of Global Equities Division, RBC Capital Markets, Testimony on "High Frequency Trading's Impact on the Economy" before the Senate Committee on Banking, Housing and Urban Affairs, Subcommittee on Securities, Insurance, and Investment, 18 June 2014, <https://www.rbccm.com/assets/rbccm/docs/us-equities/market%20structure%206-18-14%20testimony%20FINAL.PDF>, ("To that end, we have proposed as a first step that the Commission conduct a pilot study of an alternative to maker/taker pricing. Such a study would, for a 6-month period, take 50 of the 100 most heavily traded U.S. stocks and, for those 50 stocks, prohibit the payment of rebates (or comparable inducements), and mandate that all venues where those stocks are traded be required to implement a rebate-free pricing structure.")

[6] SEC Proposed Rule to Conduct a Transaction Fee Pilot in National Market System Stocks, 14 March 2018, <https://www.sec.gov/rules/proposed/2018/34-82873.pdf>

[7] SEC Proposed Rule on Enhanced Disclosure of Order Handling Information, 13 July 2016, <https://www.sec.gov/rules/proposed/2016/34-78309.pdf> ("This focus on order handling has intensified in recent years as routing and execution practices have evolved as markets have become more automated, dispersed, and complex.")

[8] SEC, Self-Regulatory Organization Rulemaking, <https://www.sec.gov/rules/sro.shtml>.

[9] See endnote 6.

[10] See endnote 7.