CITADEL | Securities

March 31, 2023

Ms. Vanessa A. Countryman
Secretary
Securities and Exchange Commission
100 F Street NE
Washington, DC 20549–1090

Re: Order Competition Rule (File No. S7-31-22)

We appreciate the opportunity to provide comments to the Securities and Exchange Commission (the "Commission") on its proposal to require most retail orders to be routed to a new exchange auction mechanism of the Commission's own invention (the "Proposal").[1]

Rarely has the Commission issued such an ill-considered, completely untested proposal. For decades, the Commission, through Regulation NMS rules and policies, has encouraged exchanges, ATSs, and broker-dealers to vigorously compete to provide the best execution quality, thereby melding competition among *orders* with competition among *market centers*. In promoting this longstanding regulatory approach, the Commission has stressed that a completely centralized system "loses the benefits of vigorous competition and innovation among individual markets."[2]

Retail investors have benefited enormously from this competition among market centers; not only do they frequently get better prices than those publicly quoted, but they often get their orders filled at such prices for more shares than are publicly displayed. Academic research has found definitively that wholesale broker-dealers provide better prices than exchanges for marketable retail orders more than 90% of the time when factoring-in exchange fees.[3] In aggregate, wholesale broker-dealers delivered approximately $3 billion in savings to retail investors during 2022 via price improvement according to the statistics published pursuant to Commission Rule 605. This reported amount will significantly increase once the Commission implements its Rule 605 proposal to enhance the accuracy of execution quality statistics, with recent academic research finding that updating Rule 605 may increase reported price improvement statistics by *5 times*, which would equate to approximately $15 billion in 2022.[4]

The Commission largely ignores all of this data regarding current retail execution quality while dramatically reversing its prior policy position and seeking to eliminate competition among market

---

[1] 88 FR 128 (Jan. 3, 2023), available at: https://www.govinfo.gov/content/pkg/FR-2023-01-03/pdf/2022-27617.pdf.

[2] 70 FR 37496 (June 29, 2005) at 37499. *See also id.* ("Since Congress mandated the establishment of an NMS in 1975, the Commission frequently has resisted suggestions that it adopt an approach focusing on a single form of competition that, while perhaps easier to administer, would forfeit the distinct, but equally vital, benefits associated with both competition among markets and competition among orders.").

[3] Battalio, Robert H. and Jennings, Robert H., Why Do Brokers Who Do Not Charge Payment for Order Flow Route Marketable Orders to Wholesalers? (Dec. 14, 2022) available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4304124 ("Battalio study") at 37. We note this may be a conservative estimate since size improvement is not taken into account for purposes of this calculation.

[4] Battalio study at 1.

centers by requiring nearly all retail marketable orders to be sent to an auction mechanism that, in practice, only exchanges will be permitted to offer.[5] The Commission attempts to justify this unprecedented and radical approach by performing a highly theoretical comparison of liquidity provider profitability on-exchange and off-exchange that leads the Commission to claim that retail investors will save an additional $1.5 billion per year under the Proposal.[6]

As detailed below, this highly theoretical comparison of liquidity provider profitability suffers from numerous critical flaws, including inflating key variables in the calculation that skew the comparison in favor of on-exchange executions, grouping fundamentally different types of orders together, and failing to consider the inherent biases of the realized spread metric that prevent an accurate comparison of on-exchange and off-exchange trading. Indeed, the Commission's own data and methodology suggests that, for market orders (which constitute at least 80% of total retail orders by dollar volume according to Commission data), the Proposal would actually result in retail investors losing $2.4 billion per year on-exchange.[7] The Commission fails to explain why the Proposal ignores its own illuminating finding.

More fundamentally, the Commission's economic analysis fails to consider at all how retail investors would be expected to fare under the prescriptive and untested auction mechanism set forth in the Proposal. Critically, by providing all other market participants with detailed information regarding the retail order awaiting execution in an auction, the Proposal creates a mechanism that effectively licenses and encourages others to trade ahead of retail orders. This dramatically increases the likelihood that prices move against the retail investor while the order is delayed, particularly for larger orders and orders in less liquid stocks, and underscores that the true intent of the Proposal is to punish wholesale broker-dealers (and not to improve outcomes for retail investors).

Other aspects of the proposed auction mechanism are similarly baffling. Retail investors would be required to use this auction mechanism over five million times per day,[8] with hundreds of auctions often required simultaneously in a given symbol. In addition, the auction designed by the Commission can – and will – fail to result in an execution. When this occurs, one should expect the retail investor to receive far worse execution quality, as the market is fully aware of the auction failure and will take that into account (as well as the price impact from the information leakage and trading ahead that has occurred) when determining whether, and at what price, to fill the order. In addition, as part of its explicit effort to favor exchanges, the Commission will continue to permit limitations on their liability. Moreover, exchanges will continue to be exempted from best execution requirements, and new exchange fees are introduced. All of these characteristics of the proposed auction mechanism disfavor retail investors.

---

[5] We note that, while it is theoretically possible for an ATS to qualify to operate a retail auction, the Commission notes that no ATS currently meets the proposed criteria, which are explicitly designed to exclude all other market centers by requiring them to operate like exchanges in order to qualify. *See* Proposal at 155.

[6] Proposal at 129-30.

[7] *See infra* note 44.

[8] Based on our internal data, scaled market-wide using 2022 Rule 605 data. This estimate is conservative, as Rule 605 data does not separate out SDP activity.

The Proposal is also strikingly inconsistent with the other equity market structure proposals issued simultaneously by the Commission. For example, the Commission uses current data published pursuant to Rule 605 to assess retail execution quality, while acknowledging in its Rule 605 proposal that this data suffers from significant shortcomings and materially understates retail execution quality. In addition, this Proposal is patently contradictory with the Commission's Best Execution proposal by requiring retail orders to be routed to an auction mechanism (or an exchange) even if the routing broker-dealer believes another venue would deliver a more favorable outcome for the order. Finally, the Commission does not consider the wide-ranging effects of its Minimum Pricing Increments and Access Fees proposal on quoted spreads, quoted size, market depth, order routing, and exchange market share, all of which may influence retail execution quality and alter the economic impact of this Proposal.

Ultimately, it is clear that the Commission has no basis to assert that retail investors will save an additional $1.5 billion per year under the Proposal, which we detail further in this letter. Instead, the proposed auction mechanism is a poorly considered theoretical experiment that will demonstrably harm retail execution quality and the broader goals of market liquidity, capital formation, and economic growth. More specifically, the Commission is putting at risk the estimated $15 billion in price improvement delivered by wholesale broker-dealers today in order to reduce internalization and curtail the wholesale broker-dealer business model. These consequences directly contradict the Commission's mandate under Section 11A of the Securities Exchange Act of 1934 (the "Exchange Act") to ensure "fair competition" and "equal regulation."

U.S. capital markets are the envy of the world. They are the deepest and most transparent financial markets, and those strengths fuel the innovation and growth that have defined the U.S. economy and our global pre-eminence. Our capital markets' standing, however, is neither pre-ordained nor guaranteed. The primacy of our markets is a result of a number of factors, not least of which is a regulatory philosophy that has placed competition at the center of it for five decades. Competition is the lifeblood of innovation, and different market centers have innovated successfully to produce the best outcome for investors. This approach to regulation has also been the result of thoughtful, pragmatic and tested policies in an environment where market participants and the Commission have engaged constructively, with the Commission leveraging the experience of the private sector to advance public policy objectives and promote overall market competition, efficiency, and stability.

Unfortunately, this Proposal is antithetical to that approach and risks undoing much of the progress that has been forged since Congress mandated the National Market System in 1975. We therefore respectfully urge the Commission to withdraw this Proposal in its entirety.

Table of Contents

I. The Proposal's Economic Analysis is Fatally Flawed

The Proposal requires nearly all retail marketable[9] orders to be routed to a new exchange auction mechanism of the Commission's own invention. The Commission attempts to justify this unprecedented and radical approach by performing a highly theoretical comparison of liquidity provider profitability on-exchange and off-exchange that leads the Commission to claim that retail investors will save an additional $1.5 billion per year under the Proposal.[10]

This claim suffers from numerous flaws, including failing to accurately measure current retail execution quality, inflating key variables in the calculation that skew the comparison in favor of on-exchange executions, grouping retail and non-retail orders together, and failing to consider the inherent biases of the realized spread metric that prevent an accurate comparison of on-exchange and off-exchange trading. In the end, it is clear that the Commission has no basis to assert that retail investors will save an additional $1.5 billion per year under the Proposal. Instead, the Commission is putting at risk the estimated $15 billion in price improvement delivered by wholesale broker-dealers today (calculated as noted above). Retail investors deserve better than to be subject to this sort of reckless experimentation by the Commission.

A. The Economic Baseline Materially Understates Retail Execution Quality

The Commission's analysis is remarkable: the Proposal explicitly affirms that "marketable orders routed to wholesalers appear to have higher fill rates, lower effective spreads, and lower E/Q ratios,"[11] but then proceeds to ignore this data. Indeed, the Proposal does not meaningfully assess the data customarily used to determine retail execution quality (or consider the implications of the separate Commission proposal to correct significant shortcomings with current Rule 605 data), before concluding that current market structure must be completely upended.

(i) The Proposal Ignores the Extensive Data Demonstrating the Exceptional Retail Execution Quality Delivered by Wholesale Broker-Dealers

A number of metrics are typically used to assess retail execution quality, including (a) price improvement (the amount of savings delivered to retail investors by executing transactions at prices that are better than the national best bid and offer ("NBBO")), (b) effective over quoted spread (measuring whether the actual transaction price was better than the quoted price on-exchange at the time of order entry), and (c) fill rates (the percentage of orders that were successfully executed).[12] Across all of these metrics, there is a wealth of data showing the exceptional execution quality delivered by wholesale broker-dealers.

---

[9] Marketable orders are orders that are to be executed immediately at the current market price. These include market orders, which seek an execution at the best available price, and limit orders, which specify a limit price beyond which the investor is not willing to trade.

[10] Proposal at 129-30.

[11] Proposal at 186.

[12] *See* Battalio study at 3.

- Price Improvement. According to the data published pursuant to Commission Rule 605, wholesale broker-dealers delivered approximately $3 billion in savings to retail investors during 2022 via price improvement. Analysis by individual retail broker-dealers and academics further underscores the breadth and significance of these savings, consistently finding that more than 85% of all retail marketable orders receive price improvement.[13] In addition, these studies find that approximately 50% of retail marketable orders executed by wholesale broker-dealers receive the midpoint price or better (meaning the order does not pay *any* spread).[14] Crucially, academic research finds that wholesale broker-dealers provide better prices than exchanges for marketable retail orders more than 90% of the time when factoring-in exchange fees.[15]

- Effective Over Quoted Spread ("E/Q"). In the past decade, the average E/Q delivered by wholesale broker-dealers for market orders has improved (i.e. declined) by nearly 60%. On average, retail investors now only pay approximately 45% of the quoted half-spread (i.e. the spread between the midpoint and the NBBO; *see Appendix A*). Analysis by individual retail broker-dealers finds that some have benefited from even larger improvements.[16]

  In contrast, retail orders routed to exchanges are consistently executed at all-in prices that are *worse* than the quoted spread due to the fact that the size of the order may be larger than available liquidity at the NBBO. Irrespective of order size, the differential between the average E/Q delivered by wholesale broker-dealers and exchanges is vast, exceeding 50% for even the smallest orders (*see Appendix B*). In addition, the average E/Q delivered by exchanges for market orders appears to have significantly worsened in recent years based on Rule 605 data (*see Appendix A*).

  In aggregate, the observed delta between wholesale broker-dealer and exchange E/Q equates to savings for retail investors that exceed the published price improvement statistics detailed above. For example, one retail broker-dealer found that its clients saved $3.4 billion in 2021 alone by using wholesale broker-dealers instead of exchanges.[17]

- Fill Rates. Data shows that, in addition to providing better prices, wholesale broker-dealers focus on ensuring that all retail orders routed to them are successfully executed, with fill

---

[13] *See* Battalio study at 16; Charles Schwab, U.S. Equity Market Structure: Order Routing Practices, Considerations, and Opportunities (Q2 2022) at 14, available at: https://content.schwab.com/web/retail/public/about-schwab/Schwab-2022-order-routing-whitepaper.pdf ("Schwab study"); and Kothari, S.P. and Johnson, Travis L. and So, Eric C., Commission Savings and Execution Quality for Retail Trades (Dec. 2, 2021) at 9, available at: https://ssrn.com/abstract=3976300 ("Kothari study").

[14] Schwab study at 14 and Battalio study at 4. The Commission views midpoint (or better) executions as sufficiently favorable to warrant an exception from the general requirement to route retail marketable orders to an exchange auction mechanism. *See* Proposal at 244.

[15] Battalio study at 37. We note this may be a conservative estimate since size improvement is not taken into account for purposes of this calculation.

[16] Schwab study at 9.

[17] Schwab study at 17.

rates of essentially 100% for market orders.[18] In contrast, the Commission (somewhat curiously) found that the exchange fill rate for market orders was only 58%.[19]

The Proposal cursorily dismisses these metrics,[20] even though they are specifically designed to accurately capture retail execution quality, including the concrete savings that accrue to retail investors when wholesale broker-dealers execute their orders at prices better than those displayed on-exchange.

(ii) Even the Published Execution Quality Data Materially Understates Retail Execution Quality, Which the Commission Acknowledges in Another Proposal

The Proposal also does not acknowledge that data published pursuant to Commission rules materially understates retail execution quality for a number of reasons, all of which are considered sufficiently material to specifically correct in the Commission's Rule 605 Proposal.[21]

First, wholesale broker-dealers often fill retail orders for more size than is publicly displayed (meaning that if the order were filled on-exchange, it could not have been fully executed at the NBBO, resulting in a worse all-in price). In its Rule 605 Proposal, the Commission acknowledges the materiality of size improvement and the fact that it is not effectively measured by current metrics.[22] Estimates suggest taking into account size improvement will at least double the reported

---

[18] *See* Battalio study at 12.

[19] *See* Proposal at 214.

[20] *See, e.g.,* Proposal at 186 ("In particular, marketable orders routed to wholesalers appear to have higher fill rates, lower effective spreads, and lower E/Q ratios. These orders are also more likely to receive price improvement and, conditional on receiving price improvement, receive greater price improvement when routed to wholesalers as compared to exchanges.") and Proposal at 192 ("In NMS common stock and ETF orders, wholesalers execute approximately 44% of shares at prices at or better than the NBBO midpoint."). We note that the Proposal's suggestion that these "better prices are due in large part to the ability of wholesalers to offer sub-penny prices that are not permitted on national securities exchanges and other trading centers" is completely inaccurate, as exchanges allow trading to occur at sub-penny prices against segmented retail order flow in retail liquidity programs and the minimum quoting increment has nothing to do with where retail order flow is ultimately executed. Proposal at 129, FN 8. *See* our response to the Commission proposal on Minimum Pricing Increments and Access Fees.

[21] We note that academic literature also often materially understates retail execution quality, both for the reasons below and also due to adopting methodologies that do not accurately classify retail orders. For example, the *Boehmer et al. (2021)* algorithm uses sub-penny trade prices to identify and sign retail trades, but subsequent research finds that approach does not capture 65% of retail trades and incorrectly signs nearly 30% of trades. Barber, Brad M. and Huang, Xing and Jorion, Philippe and Odean, Terrance and Schwarz, Christopher, A (Sub)penny For Your Thoughts: Tracking Retail Investor Activity in TAQ (Sept. 24, 2022) at 1, available at: https://ssrn.com/abstract=4202874 ("Barber study"). In addition, the *Lee-Ready (1991)* algorithm signs retail trades based on which side of the midpoint the trade was executed, but subsequent research finds that this will misclassify up to 20% of all retail trades (i.e. those that are executed with prices better than the midpoint). Misclassifying trades in this manner materially understates total price improvement provided to retail orders. *See* Schwarz, Christopher and Barber, Brad M. and Huang, Xing and Jorion, Philippe and Odean, Terrance, The 'Actual Retail Price' of Equity Trades (Sept. 14, 2022) at 21, available at: https://ssrn.com/abstract=4189239 ("Schwarz study"); and Kothari study at 10. The Commission cites research using, and itself uses, these inaccurate methodologies in the Proposal. *See, e.g.,* Proposal at 214, FN 572

[22] Rule 605 Proposal at 3871.

price improvement statistics for retail orders.[23] This "size improvement" was not taken into account in the Rule 605 data analyzed in the Proposal; nor does it appear to have been taken into account in the Consolidated Audit Trail ("CAT") data analyzed in the Proposal.

Second, many wholesale broker-dealers execute non-retail orders in addition to retail orders, particularly through the use of a single-dealer platform ("SDP"). As acknowledged by the Commission in its Rule 605 Proposal, these non-retail orders do not receive the same execution quality as retail orders and can "distort the general execution quality metrics."[24] As a result, the Rule 605 Proposal recommends that non-retail immediate-or-cancel ("IOC") orders be separated from the retail orders executed by wholesale broker-dealers. No such differentiation was made in the Rule 605 data analyzed in the Proposal.

Third, when assessing the execution quality provided by wholesale broker-dealers, both the Rule 605 data and the CAT data analyzed in this Proposal include transactions that were actually executed on exchanges or ATSs. In addition, both the Rule 605 data and the CAT data appear unable to identify transactions where wholesale broker-dealers "adjust the execution prices on externalized trades to provide better prices to the customer than the wholesaler(s) obtains directly from external venues when routing an order away."[25]

All of these data quality issues result in materially understating the retail execution quality provided by wholesale broker-dealers. Indeed, recent academic research has found that addressing all of these shortcomings in the Rule 605 data may increase reported price improvement statistics for retail orders by *5 times*, which would equate to approximately $15 billion in 2022. [26]

B. The Commission's Comparison of On-Exchange and Off-Exchange Execution Quality Lacks Credibility

Instead of genuinely assessing retail execution quality under the current market structure, the Commission elects to narrowly focus on a single metric – realized spread[27] – to conduct a highly theoretical comparison of liquidity provider profitability on-exchange and off-exchange. This comparison suffers from numerous methodological flaws, all of which serve to skew the results in favor of on-exchange executions, including:

---

[23] *See* Schwab study at 13; and Virtu Financial, "Measuring Real Execution Quality" (June 10, 2021), available at: https://www.sec.gov/comments/265-28/26528-8901054-242178.pdf.

[24] Rule 605 Proposal at 3803.

[25] Battalio study at 5. Furthermore, for retail orders routed to exchanges for execution, on-exchange execution quality data can look more favorable than wholesale broker-dealer execution quality data for the exact same order. This is because the wholesale broker-dealer data is reported at the "parent" order level, while the exchange will often receive several "child" orders (often with different NBBOs at the time of receipt of each "child" order). *See* Appendix D for more detail.

[26] Battalio study at 1. In addition, Rule 605 statistics would be broadened to include smaller orders of less than 100 shares and larger orders of 10,000 shares or more. Rule 605 Proposal at 3789.

[27] Realized spread measures the difference between the execution price and the midpoint of the NBBO at a fixed period of time after the execution of the order. *See infra* note 50 for a discussion of the timeframes used by the Commission.

- Inflating key variables in the calculation, such as total market volume, the estimated volume of retail orders that will be sent to an auction, and the realized spread differential between on-exchange and off-exchange trading. *(see section (i) below)*

- Comparing fundamentally different types of orders: *retail market* orders executed off-exchange with *non-retail marketable limit* orders executed on-exchange. *(see section (ii) below)*

- Failing to control for variations in market conditions, including the fact that retail investors, unlike many non-retail investors, trade under a wider range of market conditions, including when quoted spreads are significantly wider. *(see section (iii) below)*

- Failing to consider the inherent biases of the realized spread metric that prevent an accurate comparison of on-exchange and off-exchange trading. *(see section (iv) below)*

Fundamentally, the Commission's economic analysis appears contrived to validate a pre-determined conclusion. Inconvenient truths are ignored, including that wholesale broker-dealers deliver far superior execution quality compared to exchanges according to both (a) the industry-standard metrics used to assess retail execution quality (as detailed above) and (b) the Commission's highly theoretical comparison of liquidity provider profitability when focusing on retail orders (as detailed in section (ii) below). Instead, the Commission appears to adjust the data set and related assumptions in an arbitrary and capricious manner until the desired conclusion is reached.

In addition, in focusing solely on a highly theoretical comparison of liquidity provider profitability on-exchange and off-exchange, the Commission makes no attempt to consider how retail investors would be expected to fare under the actual untested and prescriptive auction mechanism set forth in the Proposal. The myriad flaws detailed below completely undermine the Commission's baseless assertion that retail investors will save an additional $1.5 billion per year under the Proposal.[28]

(i) The Commission's Methodology Contains Obvious Errors That Skew the Comparison in Favor of On-Exchange Executions

The Commission's methodology for comparing the profitability of on-exchange and off-exchange liquidity providers contains obvious errors that skew the results in favor of on-exchange executions. These errors include:

- **Inflating total market volume**. The Proposal estimates total 2022 market volume by multiplying Q1 2022 volume by four.[29] However, actual 2022 market volume was

[28] Proposal at 130.

[29] Table 19, Proposal at 209.

significantly lower.[30] Using actual 2022 market volume reduces the purported differential by almost $300 million.[31]

- **Inflating the estimated volume of retail orders that will be sent to an auction**. Even though the Proposal requires only retail marketable orders to be sent to an auction, the Commission includes other types of orders, such as non-marketable limit orders, when calculating the purported savings to retail investors.[32] This appears simply disingenuous, as there is no basis for doing so.

  In addition, retail marketable orders that receive midpoint or better are not required to be sent to an auction. The Commission found that 44% of retail marketable shares receive midpoint or better, but yet still includes these orders when calculating the purported savings to retail investors.[33] Once again, there is no basis for doing so.

  Focusing solely on those retail orders that are required to be sent to an auction under the Proposal (i.e. marketable orders that do not already receive midpoint or better) reduces the purported differential further by nearly $575 million.[34]

- **Inflating the realized spread differential**. The Commission acknowledges that payment for order flow ("PFOF") decreases wholesale broker-dealer profitability off-exchange and exchange rebates (i.e. exchange PFOF) increase liquidity provider profitability on-exchange. However, after attempting to adjust for both of these factors in much of the economic analysis, the Commission inexplicably elects not to adjust for off-exchange PFOF in their final purported differential.[35]

  The Commission explains this selective omission by asserting that the "PFOF wholesalers currently pay to retail brokers would be converted into additional price improvement for the individual investor order."[36] However, this does not make any sense, as the Commission's methodology is purportedly intended to compare liquidity provider profitability under the current market structure, which is certainly affected by PFOF, both on-exchange and off-exchange. The Commission cannot then selectively adjust the comparison based on pure speculation as to what might transpire if the Proposal were to be

---

[30] *See* https://www.cboe.com/us/equities/market_statistics/historical_market_volume/.

[31] *See* Appendix C for a more detail.

[32] Proposal at 208, FN 533.

[33] Proposal at 193 and 208.

[34] *See* Appendix C for a more detail.

[35] *Compare* Proposal at 192 and 206.

[36] Proposal at 206. We note that the average off-exchange PFOF rate is less than 1/10 of a cent per share for retail marketable orders. Academic research has found that any difference in price improvement attributed to PFOF is "not economically meaningful." Schwarz study at 27.

implemented in a manner that explicitly skews the comparison in favor of on-exchange liquidity providers.[37]

Reversing this error further reduces the purported differential by more than $250 million.[38]

These common-sense adjustments alone reduce the purported $1.5 billion in savings to approximately $383 million *(see Appendix C for more detail)*. This number represents a small fraction of the billions in price improvement delivered to retail investors by wholesale broker-dealers today, and clearly fails to justify the Proposal to completely upend how retail orders are executed. However, as detailed below, more fundamental flaws in the Commission's methodology suggest that the actual impact of the Proposal will be dramatically worse for retail investors.

(ii) Focusing on Retail Orders Results in the Opposite Conclusion

The Commission makes the following key assumption in its economic analysis: "we would expect [wholesale broker-dealer] realized spreads to be similar to the realized spreads earned by liquidity providers of *similar orders* routed to exchanges [emphasis added]."[39] However, the Proposal does not compare similar orders at all. Instead, the Proposal compares (a) *retail market* orders executed off-exchange[40] with (b) *non-retail marketable limit* orders executed on-exchange.[41]

Retail investors typically use market orders, which seek an immediate execution at the best available price. In the Proposal, the Commission concedes that at least 80% of total retail orders (by dollar volume) are market orders.[42] In contrast, other types of investors rarely use market orders and instead typically use limit orders (including IOC orders), which specify a limit price beyond which the investor is not willing to trade. In its Rule 605 Proposal, the Commission acknowledges that IOC orders "typically have different execution profiles than other types of orders."[43]

Actually comparing on-exchange and off-exchange execution quality for market orders leads to the opposite conclusion. Based on the data presented in the Proposal, the Commission's own

[37] For example, on-exchange liquidity providers may change quoting behavior in order to compensate for the lack of rebates contemplated under the proposed auction mechanism.

[38] *See* Appendix C for a more detail.

[39] Proposal at 194.

[40] *See* Table 5, Proposal at 189, showing that market orders account for approximately 80% of wholesale broker-dealer volume.

[41] *See id.*, showing that marketable limit orders account for over 99% of exchange volume.

[42] Proposal at 188. Retail investors use market orders to obtain immediate executions without the use of sophisticated execution algorithms.

[43] Rule 605 Proposal at 3803, FN 218.

methodology finds that, **for market orders, retail investors would lose $2.4 billion per year on-exchange under the Commission's Proposal**.[44]

While this figure suffers from certain of the other flaws discussed herein with respect to the use of realized spread, it should, at a minimum, cause the Commission to re-think its entire methodology. The Commission fails to explain why the Proposal does not focus on the type of order that retail investors use the vast majority of the time if it genuinely seeks to assess the likely impact of requiring retail orders to be routed to exchanges.[45]

The Commission's only response to this striking finding is that market orders represent a small percentage of overall exchange trading activity.[46] While true, the Commission's data covers a large number of market orders (for approximately 390 million shares during the first three months of 2022), making it difficult to dismiss as merely an aberration. Furthermore, our review of market data finds that this trend of wholesale broker-dealers significantly outperforming exchanges for retail market orders holds true quarter-after-quarter across billions of retail orders. It is clearly improper and legally impermissible for the Commission to whitewash the data by dismissing this finding in a single footnote in the Proposal.

(iii) Retail Investors Trade Under a Wider Range of Quoted Spreads

As detailed in Section I(A) above, there are a number of metrics used to assess retail execution quality, including price improvement, E/Q, and fill rates. Realized spread is not one of these metrics, as it is measured from the perspective of the liquidity provider (i.e. how the market moves over a fixed period of time after trade execution), and not the retail investor.

For example, academic research has found that non-retail investors are more selective than retail investors regarding when they trade during the course of a day. As a result, on average retail orders arrive when quoted spreads are approximately 30% wider than when other investors trade.[47]

---

[44] *See* Appendix C for more detail. This figure is arrived at by (i) using the differential in realized spreads for market orders presented in Table 5 (and adjusting for the 5 mil auction fee per the Commission's methodology), (ii) reducing the estimated share of order volume to be sent to an auction by 21% to focus only on market orders, and (iii) holding total market volume constant. *See* Proposal at 189.

[45] We also note that, per the discussion below, market orders reflect "parent" orders unlike "child" orders sent as IOCs.

[46] Proposal at FN 424.

[47] Dyhrberg, Anne Haubo and Shkilko, Andriy and Werner, Ingrid M., The Retail Execution Quality Landscape (Mar. 14, 2023) at 12, available at: https://ssrn.com/abstract=4313095 ("Dyhrberg study") ("Notably, wholesalers tend to execute when the NBBOs are relatively wide, 64.92 bps vs. the exchange equivalent of 48.67 bps, a 33% difference. This difference cannot be attributed to wholesaler choices, because commercial agreements with retail brokerages do not allow wholesalers to choose what orders to execute and when. Rather, wholesalers are required to execute all orders routed to them. As such, the difference in quoted spreads must be driven by trader decisions. The difference in quoted spreads is expected given the clienteles served by wholesalers and exchanges. Many institutional trading algorithms time their activity to periods of narrow quoted spreads. When spreads are wide, they either switch from liquidity demand to liquidity supply or reduce trading altogether. Retail traders are much less likely to engage in such strategic timing. Since the metrics in Table 2 are volume-weighted, it is not surprising that liquidity-demanding exchange trades (institutional flow) tend to occur when spreads are relatively narrow."); *see also* Battalio study at 6.

Executing a retail order when quoted spreads are wider means that a wholesale broker-dealer can provide significant price improvement to the retail investor (i.e. real, tangible savings compared to the prices displayed on-exchange), but yet still end up with a larger realized spread than an on-exchange execution shortly thereafter that simply trades at the NBBO displayed on-exchange, with no price improvement. Realized spread does not accurately reflect that the retail investor received a better execution from the wholesale broker-dealer than would have been obtained on-exchange for that specific order *(see Appendix C for a more detailed example)*.

Indeed, in its Rule 605 Proposal, the Commission acknowledges that "measuring spreads in absolute terms may lead to comparisons across reporting entities that do not take into account potential differences in the timing of order flow."[48] The Proposal's sole reliance on realized spread, and the failure to control for market conditions (such as the wider quoted spreads noted above), means that the Commission has not actually considered the effect of the Proposal from the perspective of the retail investor.

(iv) Realized Spread Has Inherent Biases That Skew the Comparison in Favor of On-Exchange Executions

Below, we detail several distinct biases that demonstrate realized spread is not an accurate proxy for liquidity provider profitability in the manner suggested by the Commission and cannot be used to accurately compare on-exchange and off-exchange trading.[49] This unprecedented misapplication of the metric by the Commission results in a misleading analysis that skews the comparison in favor of on-exchange executions (*see Appendix C for more detailed examples)*.

1. <u>Realized Spread Does Not Consider the Actual Exit Trade</u>

Realized spread completely ignores the exit trade, both with respect to (i) timing and (ii) price.

First, realized spread assumes that liquidity providers exit each position in a costless manner at the end of a fixed period, and is therefore highly dependent on the time horizon used to make the calculation. Regardless of the time horizon used (of which the Commission separately appears unsure),[50] the assumption that liquidity providers exit each position at the end of a fixed period is

[48] Rule 605 Proposal at 3855.

[49] Compare the Proposal at 225 ("the realized spread (i.e., the wholesaler's profit margin)") with the examples in Appendix C showing why realized spread cannot be used to accurately compare on-exchange and off-exchange trading. In addition, we note that the Proposal finds that realized spreads on-exchange decrease as quoted spreads increase (and indeed turn negative as quoted spreads widen on-exchange). Wider quoted spreads generally lead to greater profitability for liquidity providers. Proposal at 194.

[50] *See* Rule 605 Proposal at 3814 ("Selecting an appropriate time horizon to calculate the realized spread is important, as realized spreads vary significantly as the time horizon is changed."). Notably, the Commission appears uncertain about how to set the time horizon, using one minute when analyzing data from the Consolidated Audit Trail ("CAT") and five minutes when analyzing Rule 605 data. The Commission provides no explanation as to why it is appropriate to use different time horizons for CAT data versus Rule 605 data. Separately, the five-minute time horizon for Rule 605 data directly conflicts with the Commission's Rule 605 Proposal to change the time horizon to 15 seconds and one minute. In that proposal, the Commission states: "[t]he Commission believes that current requirements in Rule 605 related to measures of effective and realized spreads may lead to

inconsistent with actual trading practices, where liquidity providers hold positions for varying periods of time depending on market making and hedging strategies, liquidity characteristics of the relevant stock, and market conditions. Recent academic research has found that, as a result of using a fixed time horizon, realized spread does not serve as an accurate proxy for liquidity provider profits at all.[51] Specifically, the research concludes that "mismeasurement in the estimates of profits using realized spread (with a common [time horizon] for all trades) can be large."[52]

Second, realized spread does not consider the price (or effective spread) of the exit trade.[53] We note this methodological flaw skews the comparison in favor of on-exchange executions, as wholesale broker-dealers have much lower effective spreads than on-exchange liquidity providers.[54]

2. Realized Spread Does Not Consider Fixed or Variable Costs

Realized spread does not account for fixed or variable costs, such as trading infrastructure, personnel, exchange memberships, and market data, regulatory, and transaction fees (including fees, rebates, and PFOF).[55] The Commission incorrectly assumes that on-exchange and off-exchange liquidity providers have "similar fixed costs."[56] Instead, these fixed and variable costs are likely to be significantly greater for wholesale broker-dealers compared to on-exchange liquidity providers due to the technology, personnel, and compliance framework required for a customer order handling business.[57] In fact, an unwillingness to assume additional fixed and variable costs may be a key reason why certain on-exchange liquidity providers are not active in off-exchange retail trading. As a result, this methodological flaw also skews the comparison in favor of on-exchange executions.

3. Realized Spread Cannot Compare a Large "Parent" Order With Smaller "Child" Orders

Wholesale broker-dealer execution quality data is reported at the "parent" order level. However, exchanges typically receive "child" orders to execute against specific price levels as part

uninformative or incomplete information." Rule 605 Proposal at 3853. There is no explanation as to why these same realized spread statistics are now cited as the sole basis for upending U.S. equity market structure.

[51] Yang, Lingyan and Lohr, Ariel, The Profitability of Liquidity Provision (Feb. 13, 2022) at 9, available at: https://ssrn.com/abstract=4033802. This study is only cited in a single footnote in the Proposal. Proposal at 188, FN 426.

[52] *Id.*

[53] *Id.*

[54] For example, the exit trade entered into by a wholesale broker-dealer is likely to include price improvement compared to the prevailing NBBO, reducing any spread captured by the wholesale broker-dealer.

[55] While the Commission attempts to adjust for exchange rebates and off-exchange PFOF in much of the economic analysis, the Commission inexplicitly elects not to adjust for off-exchange PFOF in their final purported differential.

[56] Proposal at 190.

[57] In addition, wholesale broker-dealers will often pay exchange fees rather than collect exchange rebates, and are exposed to much greater potential liability than on-exchange liquidity providers *(see Section III below)*.

of executing an oversized order (whether from a retail or non-retail investor). Given the inverse relationship between price impact and realized spread (i.e. a lower price impact results in a higher realized spread), investors attempting to execute an oversized order would actually prefer higher realized spreads to be reported by market centers (which would indicate lower price impact). Instead of accurately measuring on-exchange execution quality, the lower realized spreads identified by the Commission for on-exchange executions reflect the higher price impact associated with executing larger orders through smaller "child" slices on-exchange. In fact, in its Best Execution Proposal, the Commission acknowledged that "[m]etrics that apply to small order executions may miss how well or poorly the large order traded overall."[58]

4. Realized Spread Does Not Consider the Price Impact-Mitigating Effects of Principal Liquidity

By focusing on the degree to which the midpoint of the NBBO moves, realized spread contains another inherent bias that skews the comparison in favor of on-exchange executions. This is because an on-exchange execution can move the NBBO all by itself. To understand why, consider a buy order that is executed off-exchange by a wholesale broker-dealer at the NBO. Since the order is executed off-exchange, available liquidity on-exchange is unaffected and the execution will not directly impact the NBBO. However, if the same buy order is executed at the same price on-exchange, it may exhaust all of the available liquidity at the NBO. In this situation, the midpoint of the NBBO will move as a result of the execution unless liquidity providers offer more liquidity at that same price level. If the NBBO instead ticks up, the realized spread calculated for the on-exchange execution will automatically be lower than the off-exchange execution, even though both executions were for the exact same price.[59]

C. Other Methodological Flaws

The Proposal also fails to explain:

- **Why any of the purported results are relevant for the proposed auction mechanism**. The Proposal does not simply require nearly all retail marketable orders to be routed to an exchange; instead, it requires that those orders be routed to a specific trading protocol with characteristics that are set out in extraordinary detail by the Commission. The Proposal does not explain why attempting to analyze general on-exchange trading is at all relevant to assessing how this specific trading protocol would be expected to perform. The many flaws of the untested and prescriptive auction mechanism are detailed in Section II below.

[58] 88 FR 5440 (Jan. 27, 2023) at FN 169, available at: https://www.govinfo.gov/content/pkg/FR-2023-01-27/pdf/2022-27644.pdf ("Best Execution Proposal").

[59] Citadel Securities has consistently supported measures to strengthen the NBBO, such as updating the round lot definition to capture more orders in high-priced stocks. *See* our comment letter on the Minimum Pricing Increments and Access Fees proposal and our comment letter to the Market Data Infrastructure Proposal (May 26, 2020), available at: https://www.sec.gov/comments/s7-03-20/s70320-7235178-217088.pdf.

Academic research that has considered this specific question has concluded that an auction mechanism would be harmful for retail investors, resulting in less competition and worse execution quality.[60]

- **How market participants can reproduce the analysis**. In addition to using CAT data that is not publicly available, the Commission makes many subjective adjustments to the data such that market participants are unable to re-produce the analysis in order to adequately scrutinize the results. Nearly every data element appears to be adjusted in some manner, with the Commission subjectively (a) selecting the broker-dealers and orders to focus on, (b) adjusting results for exchange fees, rebates, and off-exchange PFOF, (c) attempting to remove orders that are above $200,000 in value, and (d) averaging spreads and winsorizing data.[61] The end result is a proprietary analysis that is inconsistent with the Commission's obligations under the APA.[62]

Considering the numerous and significant flaws detailed above, the Commission has absolutely no basis to assert that retail investors will save an additional $1.5 billion per year under the Proposal.

[60] *See* Ernst, Thomas and Spatt, Chester S. and Sun, Jian, Would Order-by-Order Auctions Be Competitive? (Dec. 13, 2022) at 51, available at: https://ssrn.com/abstract=4300505 ("Ernst study") ("Market makers obtain higher profits in the auction relative to the broker's routing system. Retail investors can be worse off in the switch to order-by-order auctions, particularly in illiquid stocks or at times when interest in voluntary liquidity provision is low, as market participants could opt not to provide any liquidity in the auction.").

[61] *See generally* Tables 6 and 7, Proposal at 188-194.

[62] *See Chamber of Commerce v. SEC*, 443 F.3d 890, 899 (D.C. Cir. 2006) ("Section 553 of the APA requires that an agency give notice of a proposed rule setting forth 'either the terms or substance of the proposed rule or a description of the subjects and issues involved,' 5 U.S.C. § 553(b), and 'give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation,' *id.* § 553(c). Among the information that must be revealed for public evaluation are the 'technical studies and data' upon which the agency relies.").

II. The Proposed Auction Mechanism Will Harm Retail Investors

In the Proposal, the Commission invents an entirely new auction mechanism that retail investors will be required to use more than five million times per day.[63] In doing so, the Commission sets forth a number of untested and overly prescriptive requirements, many of which will invariably negatively impact execution quality for retail orders. These include:

- **The required information disclosure will effectively license and encourage others to trade ahead of retail orders**. Each time a retail order is sent to the new auction mechanism, the Proposal requires that the auction be announced through a message in the publicly available market data feed. This message would include detailed information regarding the characteristics of the retail order, including the stock, the direction (buy or sell), and the auction limit price.[64]

  As a result, all market participants would be aware of the relevant characteristics of the retail order prior to that order actually being executed, and would be freely permitted to trade ahead of the retail order on the basis of that information even though the execution of the retail order is not certain (as discussed below).[65] The Proposal thus creates a mechanism that effectively licenses and encourages others to trade ahead of retail orders. This mandated information leakage significantly increases the likelihood that prices move against the retail investor while the order is delayed for 100 to 300 milliseconds in the auction (particularly for larger orders and orders in less liquid stocks). The Commission does not consider this outcome at all, constituting a key omission in its economic analysis, nor does it attempt to square this with longstanding Commission and FINRA rules designed to prevent trading ahead of retail customer orders, such as the Manning Rule.[66]

- **Retail executions will be delayed for 100 to 300 milliseconds**. The Commission finds that the median execution time for internalized retail orders is 3.6 milliseconds.[67] However, the new auction mechanism would dramatically lengthen these execution times, increasing the current median of 3.6 milliseconds by *27 to 83 times*. Arbitrarily delaying the execution of retail orders has several negative consequences.

  First, it is much more likely that prices will move against the retail investor while the order is delayed. The Commission attempts to dismiss this concern by arguing that there is a "low probability that the NBBO will move away from individual investor orders in the very short time period of a qualified auction" since a "low percentage of orders [are]

[63] *Supra* note 8.

[64] Proposal at 157.

[65] We note the $200,000 threshold for defining a retail order means that oversized orders can be included, which may be particularly harmed by the mandated information leakage. This threshold can also result in retail and professional orders being commingled.

[66] *See* FINRA Rule 5320.

[67] Proposal at 196.

executed outside the NBBO when routed to wholesalers."[68] This comparison lacks any credibility; currently, wholesale broker-dealers execute retail orders as quickly as possible, provide exceptional execution quality, and help stabilize the NBBO through providing incremental liquidity compared to what is available on-exchange. This has no bearing on whether prices will move against the retail investor during a much lengthier execution process that does not benefit from wholesale broker-dealer internalization.[69] Indeed, as discussed below, certain other features of the auction mechanism may significantly increase the likelihood that prices move against the retail investor.

Second, delaying the execution of retail orders means that multiple auctions will need to be held simultaneously for the same stock. A review of retail orders that Citadel Securities handled during Q1 2022 finds that approximately 10% (20%) were submitted within 100 (300) milliseconds of another order in the same stock. Indeed, for certain stocks, up to 60% of all retail orders were submitted within 300 milliseconds of another order in the same stock and we found instances where over 100 individual retail orders in the same stock were submitted within 300 milliseconds.

These figures increase further during periods of market volatility. For example, during January 2021, the percentages of retail orders that would trigger simultaneous auctions in a given symbol roughly doubled. For specific stocks, more than 80% of all orders were submitted within 100 milliseconds of another order in the same stock and we found instances where nearly 400 individual retail orders in the same stock were submitted within 300 milliseconds. We note that these figures are based on retail orders that we handle and should be further extrapolated on a market-wide basis. The notion of an exchange holding a thousand or more *simultaneous* auctions *in the same stock* is not contemplated at all in the Proposal; nor is the likely adverse impact on execution quality, market efficiency, and market resiliency (including associated operational risk).

- **The auction mechanism can fail to result in an execution**. The auction mechanism invented by the Commission can fail to result in an execution, in which case the retail order would need to be routed to an exchange or *another auction*. In the event this occurs, one should expect the retail investor to receive far worse execution quality, as the market is fully aware of the auction failure and will take that into account (as well as the price impact from the information leakage and trading ahead that has occurred) when determining whether, and at what price, to fill the order. For this reason, a wholesale broker-dealer is unlikely to have any interest in internalizing the order at this stage. The Commission fails

[68] Proposal at 147. We note the Commission also attempted to analyze "fade probability" using a methodology for identifying retail orders that academic research has found does not capture 65% of retail trades and incorrectly signs nearly 30% of trades. *See* Barber study.

[69] *See* Battalio, Robert H. and Jennings, Robert H., On the Potential Cost of Mandating Qualified Auctions for Marketable Retail Orders (March 28, 2023), available at: https://directory.mendoza.nd.edu/media/1958/battalio-jennings-comment-letter-20230328.pdf (finding that "the annualized cost of adverse movements computed 100 milliseconds after orders are received by wholesaler(s), which is the duration of the shortest proposed auction, ranges from $1.73 billion to $1.88 billion. When we use the length of the longest proposed auction, the annualized cost ranges from $2.17 billion to $2.55 billion.").

to consider the implications for execution quality if an auction fails and how often that may be reasonably expected to occur, including during periods of market volatility.

- **Arbitrary priority rules discourage participation**. In contrast to the usual price-time priority rules that apply on exchanges, the Proposal mandates arbitrary priority rules for the new auction mechanism, picking winners and losers without regard for market liquidity and fairness. For example, firms that are not registered as broker-dealers are given priority. This will discourage bidding by registered broker-dealer market makers, thereby increasing the likelihood of auction failures, and may disincentivize firms from registering as broker-dealers. In addition, displayed liquidity in the exchange's order book is given priority over auction responses, but this is undermined by permitting auction bidders to bid in 1/10 of a cent increments, while those posting displayed prices cannot.[70]

- **Trading in less liquid symbols would be particularly impacted**. The concerns discussed above would be particularly impactful for less liquid stocks.[71] Under the Proposal, wholesale broker-dealers could be more selective regarding which retail orders to bid for (rather than guaranteeing the execution of all retail orders routed to them). This means that retail orders in less liquid (and more difficult to trade) stocks should be expected to receive worse execution quality compared to the current *status quo*, as failed auctions, trading ahead, and fading of the NBBO would all be more impactful for these orders. Thus, the Proposal is inconsistent with prior Commission efforts to improve liquidity conditions and support capital formation in this segment of the market.[72]

- **Exchanges do not have flexibility to fully protect retail investors**. Exchanges are protected by strict limitation of liability provisions that often cap damages at an aggregate of $500,000 per month.[73] As market events have demonstrated, these caps bear no relation to the substantial costs that can result from an exchange error or system outage. Before mandating that nearly all retail marketable orders be sent to an auction mechanism on an exchange, the Commission must consider how to appropriately protect retail investors in the event of an error or outage. While wholesale broker-dealers often provide ancillary customer services, such as adjusting trades and resolving trade errors, exchanges do not. In addition, exchanges would continue to be exempt from best execution requirements under the Proposal, meaning that, once a retail order is routed to the auction mechanism, neither the exchange nor the auction bidders have any best execution obligations.

---

[70] With the exception that certain symbols may be assigned a 1/10 of a cent quoting increment under the Commission's proposal on Minimum Pricing Increments and Access Fees.

[71] In addition, the Proposal requires retail marketable orders to be sent to the auction from 4am to 8pm ET, even though there is typically less liquidity during extended hours trading. Proposal at 156.

[72] *See, e.g.,* "SEC Issues Statement on Market Structure Innovation for Thinly Traded Securities," available at: https://www.sec.gov/news/press-release/2019-217.

[73] *See, e.g.,* BATS Exchange, Inc. Rule 11.16 (limiting liability to an aggregate of $500,000 per month); and EDGX Exchange Rule 11.12 (limiting liability to an aggregate of $500,000 per month).

- **Retail investors will subsidize new exchange fees**. Given that the Commission is, for the first time, mandating that nearly all retail marketable orders be sent to an exchange, one might assume that there would not be any associated fees. However, the Commission appears focused on ensuring that exchanges can maintain their current "net capture" rate when facilitating retail auctions.[74] Since auction bidders will factor these exchange fees into quoted prices, retail investors will likely end up bearing these new costs that are injected into the system by the Commission.

- **Options market experience dictates caution**. Not only did the Commission fail to adequately consider the issues above, it also elected to largely disregard market experience with retail auctions in the options market. In options, with auctions of similar duration, participation is mainly limited to a small handful of sophisticated market makers, with five firms accounting for over 90% of total volume executed in the auctions. Instead of analyzing why auction participation tends to be so concentrated, the Commission introduced ill-conceived requirements that may further discourage participation, such as giving priority to firms that are not registered as broker-dealers.

Overall, the auction mechanism is a poorly considered theoretical experiment by the Commission that will demonstrably harm retail investor execution quality. Ultimately, the Commission fails to address the main reason why the proposed auctions will not result in broad participation – only a small handful of firms invest in the technology and trading acumen necessary to successfully compete in millions of auctions in thousands of symbols per day against two-sided retail order flow, with the potential for hundreds (or even thousands) of such auctions to occur simultaneously in a given symbol. Compelling those firms to interact with retail orders through a convoluted, expensive, and prescriptive auction mechanism does not lead to better outcomes for retail investors.

[74] Proposal at 159-60.

III. The Proposal Inappropriately Favors Exchanges

The current regulatory framework implemented under Regulation NMS effectively complements competition among *orders* with competition among *market centers*, with the Commission stating that "a totally centralized system [. . .] loses the benefits of vigorous competition and innovation among individual markets."[75] The Commission dramatically reverses course in this Proposal and establishes a completely centralized system by requiring nearly all retail marketable orders to be sent to an auction mechanism that, in practice, only exchanges will be permitted to offer. In doing so, the Commission fails to adequately explain why it no longer views venue competition as important and how this new policy position is consistent with Exchange Act requirements to ensure "fair competition" and "equal regulation" across market centers.

A. Exchanges Are Granted Exclusivity to Operate Retail Auctions

The Proposal acknowledges that it will "enhanc[e] the competitive position of exchanges."[76] This conclusion is self-evident, as only exchanges are likely to operate the new retail auctions. While it is theoretically possible for an ATS to qualify to operate a retail auction, the Commission notes that no ATS currently meets the proposed criteria, which are explicitly designed to exclude all other market centers by requiring them to operate like exchanges in order to qualify.[77] In crafting these discriminatory criteria, there is no acknowledgement of the various competitive advantages that exchanges already possess under the current regulatory framework compared to other market centers, such as SRO immunity, limitations on liability, and the ability to effect market structure change through NMS plan governance. Instead, since other market centers are not subject to identical regulatory requirements as exchanges, the Commission dismissively labels them as "restricted competition trading centers," even though they are operating in accordance with regulatory frameworks ironically designed by the Commission to enhance overall market competition as required by the Exchange Act.[78] Once designated in such a manner, the Proposal does not even allow individual retail investors to elect to send a marketable order to these market centers; instead, all orders must go to an exchange unless they are executed at midpoint (or better).

The Proposal fails to assess the impact on market competition of granting exchanges the exclusive right to operate retail auctions. An analysis of current market share by exchange group shows that the three largest exchange groups account for nearly 90% of total on-exchange volume.[79] In addition, exchange market share already regularly exceeds 60% of total market

---

[75] 70 FR 37496 (June 29, 2005) at 37499. *See also id.* ("Since Congress mandated the establishment of an NMS in 1975, the Commission frequently has resisted suggestions that it adopt an approach focusing on a single form of competition that, while perhaps easier to administer, would forfeit the distinct, but equally vital, benefits associated with both competition among markets and competition among orders.").

[76] Proposal at 179.

[77] Proposal at 132.

[78] We note academic research has found ATSs can improve price discovery on exchanges. Zhu, Haoxiang, Do Dark Pools Harm Price Discovery? (Nov. 16, 2013) at 4, available at: https://ssrn.com/abstract=1712173.

[79] *See* https://www.cboe.com/us/equities/market_statistics/historical_market_volume/. We note that the overall U.S. equities market is highly competitive. To the extent the Commission elects to focus on specific market segments,

volume. And yet, the Commission elects to further increase exchange market share through this Proposal by dictating where retail orders must be routed.

B. The Proposal Is Explicitly Designed to Reduce Wholesale Broker-Dealer Market Share

By solely requiring retail marketable orders to be routed to an exchange auction mechanism, the Proposal specifically targets those orders that are handled by wholesale broker-dealers. In order to justify this arbitrary focus, the Commission attempts to portray the wholesale broker-dealer segment of the market as uncompetitive. This characterization is simply false.

First, the degree of concentration among the six wholesale broker-dealers in terms of market share[80] is *less* than the concentration among exchange groups (as discussed above). And yet, the Commission seeks to further increase exchange market share. Furthermore, wholesale broker-dealer market share is a direct result of regulatorily-mandated best execution requirements, pursuant to which retail broker-dealers will prioritize those wholesale broker-dealers delivering the best execution quality. In its Rule 605 Proposal, the Commission acknowledges that there is "vigorous competition" among market participants for order flow based on execution quality.[81] Therefore, it should be of little surprise that those wholesale broker-dealers delivering the best execution quality have the highest market share. Academic research has confirmed this dynamic, finding that the "largest two wholesalers charge the lowest liquidity costs."[82]

Second, this highly competitive dynamic is supported by retail broker-dealers actively monitoring execution quality metrics by connecting, and routing orders, to multiple wholesale broker-dealers and having the ability to quickly switch among wholesale broker-dealers based on execution quality. Again, academic research has found that "retail brokers appear to be controlling execution quality by routing to wholesalers who require lower compensation for liquidity generation."[83] While the Commission criticizes the routing of order flow based on past performance (however recent),[84] it is notable that the same approach is required under the Commission's Best Execution proposal and even under this Proposal when attempting to select among multiple exchange auctions. The most reliable method for determining the best venue for a particular order is to use historical performance data for similar orders.

Third, the highly competitive nature of the wholesale broker-dealer segment of the market is underscored by the recent entry of several new firms, one of which has gained considerable market

---

we note that exchange group market share statistics indicate this specific segment is considered "highly concentrated" according to the Herfindahl-Hirschman Index ("HHI").

[80] We note that the retail market share statistics cited in the Proposal are inflated by the fact that wholesale broker-dealers may execute non-retail orders in addition to retail orders, particularly through the use of single-dealer platforms. *See* Proposal at 182.

[81] *See* Rule 605 Proposal at 3787.

[82] Dyhrberg study at 1.

[83] Dyhrberg study at 6.

[84] *See* Proposal at 130.

share in a short period of time.[85] Importantly, academic research has found that the entry of these new firms did not reduce the liquidity costs charged by wholesale broker-dealers, meaning that "wholesalers do not appear to have market power."[86] Instead, retail investors benefit as wholesale broker-dealers vigorously compete to provide the best execution quality.

C. Other Market Participants Are Collateral Damage

In seeking to transfer market share from wholesale broker-dealers to exchanges, the Proposal fails to adequately assess the broader impact on market participants. For retail investors, the negative consequences include not only worse execution quality, but also a loss of the ancillary customer services that wholesale broker-dealers often provide, such as guaranteeing executions, adjusting trades, and resolving trade errors. To the extent that wholesale broker-dealers are bypassed entirely, retail broker-dealers would be required to develop order routing systems, build the required market access controls, cover the costs associated with venue membership and market data subscriptions, and pay exchange trading fees. In addition, wholesale broker-dealers have proven to be an important source of market capacity, providing consistent liquidity during periods of volatility and meeting surges in demand.

Considering all of these implications, the Commission provides little explanation as to why only retail investors are targeted by the Proposal. Data shows that ATSs and broker-dealers handling non-retail orders each account for more off-exchange trading than the retail orders that would be covered by the Proposal.[87] Furthermore, the Proposal does not eliminate PFOF; in fact, the order types that tend to receive the most PFOF, such as options orders and non-marketable limit orders, are not impacted by the Proposal at all.[88] Since these narratives do not provide the Commission with a rational basis to solely target retail investors with new onerous requirements, we are left to wonder why only those investors that are receiving the best execution quality in the current market structure must suddenly use an untested trading protocol invented out of whole cloth by the Commission (and whether the Commission may ultimately extend similar arbitrary and prescriptive order execution requirements to other types of investors).

The Proposal also has negative implications for institutional investors. Despite the Commission's unfounded assertions to the contrary, institutional investors are unlikely to participate in the proposed auctions. Leaving aside the resources required to participate in millions of ad hoc auctions in thousands of symbols per day across multiple exchanges, institutional investors typically do not engage in two-sided liquidity provision, particularly not in the 1/10 of a

[85] Jane Street has achieved a market share of greater than 10% according to published data.

[86] Dyhrberg study at 6.

[87] Proposal at 181. We note that the Proposal estimates that less than 8% of total market volume would be routed to these auctions, and the actual amount would likely be less than 5% (as discussed in Section I(B)(i) above).

[88] Proposal at 183, FN 395. We note recent academic research has concluded that PFOF is not a factor in retail broker-dealer routing decisions. *See* Schwarz study. We note the Commission attempts to rebut this conclusion by asserting that there is a "negative relationship" between PFOF and price improvement, but does not indicate the economic significance of this purported relationship. Best Execution Proposal at FN 466.

cent increments contemplated by the Proposal.[89] And any institutional investors (or sell-side routers acting on behalf of institutional investors) that might be interested would need to carefully consider whether regular auction participation would increase information leakage, disrupt their order execution strategies, or trigger broker-dealer registration requirements under the Commission's recent proposal regarding the scope of the dealer definition.[90]

To the extent that institutional investors do not regularly participate in the proposed auctions, the Proposal actually reduces opportunities for institutional investors to interact with retail order flow. The Commission found that wholesale broker-dealers route approximately 20% of total share volume to external venues for execution.[91] Institutional investors have the opportunity to interact with those retail orders on exchanges and ATSs. However, under the Proposal, those opportunities for interaction would largely disappear, as all retail marketable orders would have to be sent to the auction mechanism instead. The Commission's only unworkable response is to advise institutional investors to "cancel their midpoint orders resting on exchanges and NMS Stock ATSs and instead submit them as an auction response priced at the midpoint in the qualified auction."[92] As detailed above, there is no reason to believe this is a viable option for the vast majority of institutional investors.

D. The Commission's Favoritism Toward the Exchanges Violates the Exchange Act

The Proposal is expressly aimed at shifting the competitive balance in favor of exchanges and against wholesale broker-dealers. That project exceeds the Commission's statutory authority under the Exchange Act. In exercising its authority to "facilitate the establishment of a national market system for securities," the Commission must "assure . . . fair competition . . . between exchange markets and markets other than exchange markets" and "assure equal regulation of all markets for qualified securities."[93] Those express statutory objectives "necessarily constrain[ ]" the Commission's regulatory authority.[94]

The Commission's efforts to "enhanc[e] the competitive position of exchanges"[95] while reducing wholesale broker-dealers' market share is antithetical to the Commission's obligation under the Exchange Act to ensure "fair competition" and "equal regulation." Exchanges already enjoy a number of competitive advantages unavailable to off-exchange market centers – largely due to exchanges' status as self-regulatory organizations. The Proposal's deliberate efforts to increase exchanges' market share will only cement that competitive imbalance.

---

[89] Ernst study at 25 ("Institutional traders may be eager to buy from retail traders at times, or sell to retail traders at times, but unlikely to want to stand ready to buy or sell to retail traders at any time on demand.").

[90] 87 FR 23054 (April 18, 2022) at 23060, available at https://www.govinfo.gov/content/pkg/FR-2022-04-18/pdf/2022-06960.pdf.

[91] Proposal at 186.

[92] Proposal at 210.

[93] 15 U.S.C. § 78k-1(a)(1)(C)(ii), (c)(1)(F).

[94] *Bus. Roundtable v. SEC*, 905 F.2d 406, 416 (D.C. Cir. 1990).

[95] Proposal at 179.

First, as self-regulatory organizations, exchanges enjoy judicially-created absolute immunity from private damages suits under a wide variety of circumstances.[96] Courts have held that self-regulatory organizations and their officers "are entitled to absolute immunity when they are, in effect, 'acting under the aegis' of their regulatory duties."[97] And while the doctrine of absolute immunity is premised on the exchange's performance of regulatory functions, exchanges have claimed immunity from liability even in connection with activities that are primarily commercial in substance.[98] Wholesale broker-dealers, on the other hand, are fully exposed to private liability for their actions.

Second, exchange activities not protected by absolute immunity are often shielded by the their own rules, which strictly limit the exchanges' liability to their members.[99] Those rules are given legal effect by the Commission's approval process and through the statutory obligation that exchanges comply with their own rules.[100] Rule-based liability limitations protect exchanges from liability for even purely commercial activity of the sort engaged in by wholesale broker-dealers. Wholesale broker-dealers cannot create legally enforceable rules to protect themselves from commercial liability; they must negotiate any such protections with their customers.

Third, as self-regulatory organizations, exchanges have an inherent competitive advantage in their ability to design and implement market structure initiatives. For example, in Rule 613, the Commission delegated to self-regulatory organizations the authority to develop a national market system plan to create, implement, and maintain a comprehensive consolidated audit trail that would allow regulators to track activity throughout U.S. markets in national market system securities.[101] The Commission ultimately approved the consolidated audit trail plan that was developed by the self-regulatory organizations.[102] With respect to this critical regulation affecting the environment in which both exchanges and off-exchange market centers compete for business, exchanges' status as self-regulatory organizations allowed them to shape the legal terrain in ways that wholesale broker-dealers could not.

Exchanges' status as self-regulatory organizations gives them numerous competitive advantages in the marketplace. By deliberately aiming to promote exchanges while cutting into wholesale broker-dealers' market share, the Proposal would create a competitive imbalance that is

---

[96] *See*, *e.g.*, *Standard Inv. Chartered, Inc. v. NASD, Inc.*, 637 F.3d 112, 115–16 (2d Cir. 2011) (per curiam).

[97] *DL Cap. Grp., LLC v. Nasdaq Stock Market, Inc.*, 409 F.3d 93, 97 (2d Cir. 2005).

[98] *See*, *e.g.*, Exchange Act Release No. 67507 (July 26, 2012) (Nasdaq asserting that Facebook IPO malfunctions and consequent member losses resulted from its exercise of regulatory authority).

[99] *See*, *e.g.*, NASDAQ Equity 2 § 17(b)(2) (limiting liability to $3 million per month in aggregate or available insurance); NYSE Rule 18(c)(i) (limiting liability to $500,000 per month in aggregate).

[100] *See* 15 U.S.C. § 78s(b), (g)(1).

[101] "Consolidated Audit Trail," 77 FR 45722 (Aug. 1, 2012).

[102] "Joint Industry Plan; Order Approving the National Market System Plan Governing the Consolidated Audit Trail," 81 FR 84696 (Nov. 23, 2016).

inconsistent with the Commission's obligations under the Exchange Act to assure "fair competition" and "equal regulation" among markets.[103]

[103] 15 U.S.C. § 78k-1(a)(1)(C)(ii), (c)(1)(F).

IV. The Commission's Proposal to Effectively Bar Off-Exchange Retail Trading Would Exceed its Statutory Authority

By prohibiting wholesale broker-dealers from internalizing individual investors' orders before routing those orders to an auction (with the limited exception for trading at midpoint or better), the Proposal bars a significant portion of off-exchange trading. That attempt to channel market activity into the exchanges exceeds the Commission's authority under the Exchange Act.

In the Exchange Act, Congress tightly circumscribed the Commission's power to prohibit off-exchange transactions.[104] The Commission is authorized "to prohibit brokers and dealers from effecting transactions in [registered securities] otherwise than on a national securities exchange," but *only* following formal rulemaking – on the record and after notice and opportunity for hearing.[105] The Commission must first find that off-exchange transactions affect "the fairness or orderliness of the markets for such securities . . . in a manner contrary to the public interest or the protection of investors."[106] The Commission must next find that no rule of an exchange "unreasonably impairs the ability of any dealer" to transact in securities for his own account.[107] Finally, the Commission must find that "the maintenance or restoration of fair and orderly markets in securities may not be assured through other lawful means."[108] In short, Congress made clear that the Commission's authority to prohibit certain off-exchange transactions is a last resort, to be used only when no other lawful means will suffice.

The Commission has not even attempted to comply with these strict procedural requirements – nor could it have satisfied them if it had tried. Far from harming the public interest or the protection of investors, off-exchange transactions by wholesale broker-dealers delivered approximately *$3 billion in savings* for retail investors in 2022 alone as reported under current Rule 605,[109] and wholesale broker-dealers provide better prices than exchanges for marketable retail orders more than *90% of the time* when factoring in exchange fees.[110] Even if the Commission could demonstrate that wholesale broker-dealers' execution of individual investors' orders was somehow detrimental to the public interest, it would be unable to prove that the problem could not be solved by "lawful means" short of the novel, untested, and disruptive auction system it proposes.[111] In short, the Commission's attempt to bar an entire class of off-exchange transactions without adequate justification is an improper end-run around the statutory scheme.

[104] *See* 15 U.S.C. § 78k-1(c)(3).

[105] *Id.*

[106] *Id.* § 78k-1(c)(3)(A)(i).

[107] *Id.* § 78k-1(c)(3)(A)(ii).

[108] *Id.* § 78k-1(c)(3)(A)(iii).

[109] As noted above, addressing all of these shortcomings in the Rule 605 data may increase reported price improvement statistics for retail orders by 5 times.

[110] *See supra* pp. 5–7.

[111] 15 U.S.C. § 78k-1(c)(3)(A)(iii).

The Commission's claim to have found authority for this end-run buried in a "variety of Exchange Act provisions" is unpersuasive.[112] Congress granted the Commission specific, limited authorities to facilitate the "establishment"[113] and "orderly" functioning[114] of a national market system – that is, to provide for the orderly connection of the nation's pre-existing trading venues. Congress never authorized the Commission to create an entirely new trading protocol (a Commission-contrived auction) and force virtually all retail orders into that mechanism. If Congress *had* granted the Commission that authority, it would have said so clearly and explicitly, not buried it across "a variety" of seemingly random provisions.[115] Congress, the Supreme Court "h[as] held, does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions – it does not, one might say, hide elephants in mouseholes."[116]

[112] Proposal at 34.

[113] 15 U.S.C. § 78k-1(c)(1)(E).

[114] *Id.* § 78o(c)(5).

[115] Proposal at 34.

[116] *Whitman v. Am. Trucking Ass'n*, 531 U.S. 457, 468 (2001).

V. The Commission Failed to Consider the Impact of the Other Proposals Issued Simultaneously

In addition to the current Proposal, the Commission simultaneously issued three other proposals that address U.S. equity market structure. These proposals significantly overlap with the Proposal, and materially impact the economic analysis contained therein as detailed below. However, the Commission entirely fails to consider the impact of these other proposals, and instead "encourages commenters to review [the other proposals] to determine whether it might affect their comments on this proposing release."[117] This results in a clearly insufficient economic analysis, as well as a conflicting and confusing bundle of proposals that fail to give the public notice of the actual, ultimate regulatory requirements the Commission is proposing, and that make it impossible for the public to fully, meaningfully comment. With the Commission's ultimate proposal so unclear, the public cannot reliably discern upon what it is commenting. For this and other reasons, none of these four proposals can be properly finalized without re-proposal and full harmonization with any other proposed Commission rule on equity market structure.

A. Regulation Best Execution

This Proposal is directly inconsistent with the Best Execution proposal.[118] In particular, this Proposal would require retail marketable orders to be immediately routed to an auction mechanism (or exchange order book) if not executed at midpoint (or better) by a wholesale broker-dealer, while the Best Execution Proposal emphasizes the importance of considering and accessing available liquidity on both exchanges and ATSs.

More generally, this Proposal appears to require nearly all retail marketable orders to be routed to an auction mechanism (or an exchange) even if the routing broker-dealer does not agree that it is likely to deliver a more favorable outcome for the order. As a result, it appears broker-dealers will be faced with having to choose between complying with their obligations under this Proposal or the Commission's Best Execution proposal.[119]

B. Disclosure of Order Execution Information

In the Rule 605 proposal, the Commission acknowledges that there are several material shortcomings in current execution quality data that must be addressed. Indeed, recent academic research has found that addressing all these shortcomings in the Rule 605 data may increase reported price improvement statistics for retail orders by approximately 5 times.[120] This means that, in aggregate, billions of dollars per year in price improvement from wholesale broker-dealers is currently not factored into the analysis in this Proposal, since the Commission is relying on

---

[117] Proposal at 139, FN 98.

[118] *Supra* note 58.

[119] Notably, no one involved in the actual auction (including the exchange and the auction bidders) will be subject to best execution obligations.

[120] Battalio study at 1.

current 605 data. Before insinuating that wholesale broker-dealers do not deliver exceptional execution quality to retail investors, the Commission has the duty to update Rule 605 to produce accurate and comprehensive execution quality data.

More generally, the Rule 605 proposal focuses on the importance of providing more transparency to retail investors in order to allow them to make informed decisions. In addition, market participants and regulators will be able to compare execution quality more easily across retail broker-dealers.[121] This Proposal, however, seeks to restrict investor choice and dictate market structure outcomes by arbitrarily targeting retail investors with more onerous requirements that are likely to reduce execution quality and overall market competition.

C. Minimum Pricing Increments and Access Fees

The Minimum Pricing Increments and Access Fees proposal appears designed to limit the internalization of retail transactions by setting a minimum trading increment that is equal to the minimum quoting increment, mimicking the stated rationale in this Proposal for requiring most retail orders to be routed to an exchange auction mechanism. The Commission does not explain why it is necessary to put forward multiple proposals designed to achieve the same outcome.

In addition, this Proposal acknowledges the benefits of segmenting retail order flow and allowing retail investors to trade at better prices than those publicly quoted on exchange. As such, this Proposal permits all retail orders to trade at 1/10 of a cent increments in these new exchange auctions, regardless of the minimum quoting increment. This appears directly contrary to the Commission's stated policy in the Minimum Pricing Increments and Access Fees proposal, which includes setting a minimum trading increment that (i) applies to all market centers equally and (ii) is the same as the minimum quoting increment. Instead, if both proposals were finalized, it would appear that trading in 1/10 of a cent increments for many symbols would be permitted *solely on exchange*.

More generally, both this Proposal and the Minimum Pricing Increments and Access Fees proposal will have wide-ranging effects on market liquidity, including with respect to quoted spreads, quoted size, market depth, order routing, and exchange market share. In addition, both proposals would significantly increase costs for retail investors as more trading is required to transition on-exchange. For example, we estimate that retail broker-dealers would have incurred approximately $2.2 billion in exchange access fees alone during 2022 if marketable retail orders were required to be directly routed to exchanges.[122] These effects would be amplified across the proposals, and therefore the Commission must consider the cumulative impact if both proposals were to be finalized.

---

[121] We note that if retail orders are all being sent to the same exchange auction mechanism, then there is little value in comparing execution quality across retail broker-dealers.

[122] We estimate total retail marketable shares using Rule 605 data and our internal data and apply the access fee cap to this figure.

VI. <u>The Commission Must Adequately Consider Reasonable, Less Burdensome Alternatives</u>

Instead of requiring nearly all retail marketable orders to be routed to an exchange auction mechanism of the Commission's own invention, the Commission should continue to promote competition among exchanges, ATSs, and broker-dealers to provide the best execution quality. This includes supporting innovations with respect to trading protocols that are consistent with the core principles set forth in the Exchange Act. This approach is consistent with longstanding Commission policy positions and has demonstrably proven to benefit and protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation.

* * * * * * * * * *

We thank the Commission for considering our comments on the Proposal.

Please feel free to call the undersigned with any questions regarding these comments.

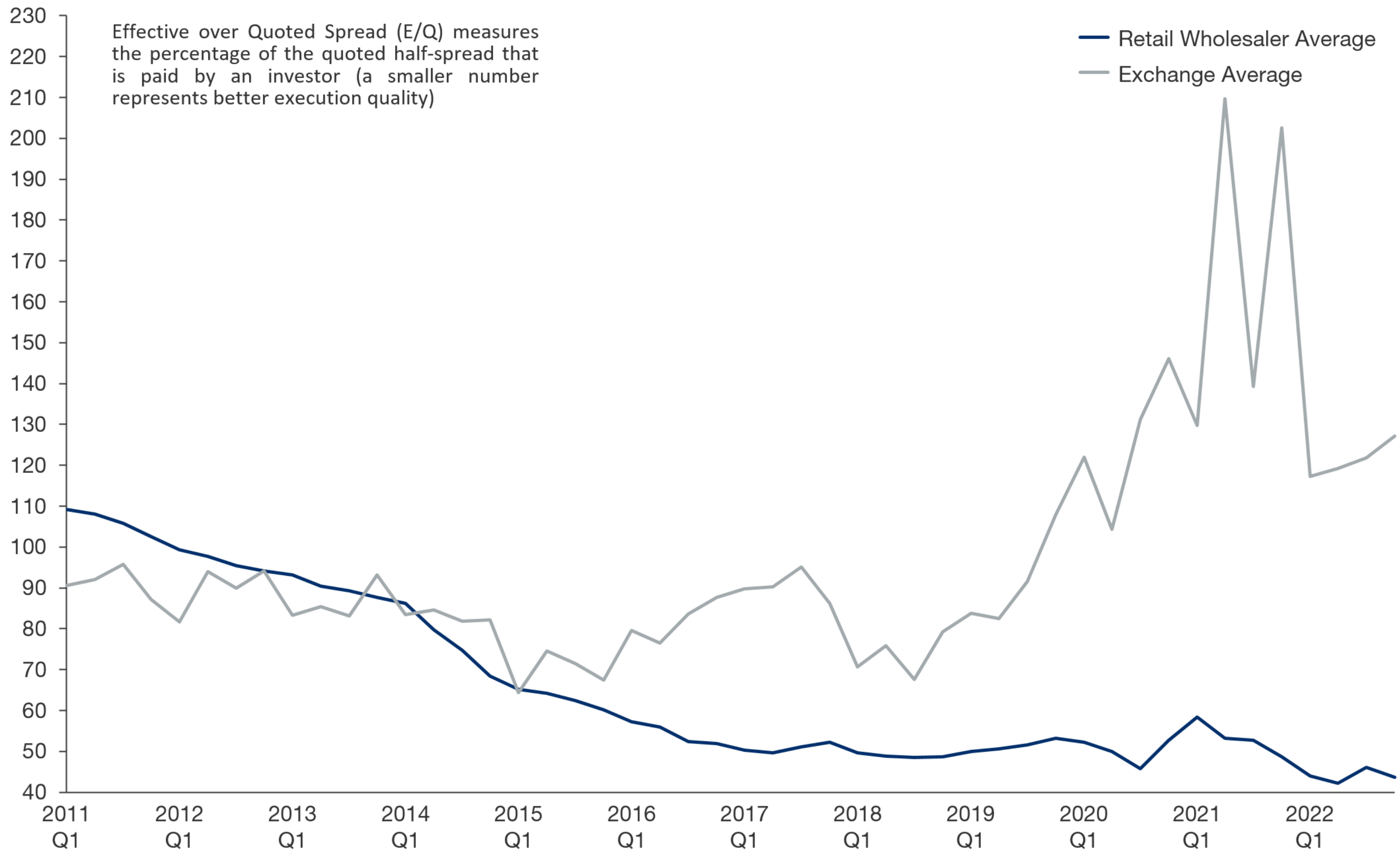
Respectfully,

/s/ Stephen John Berger

Managing Director

Global Head of Government & Regulatory Policy

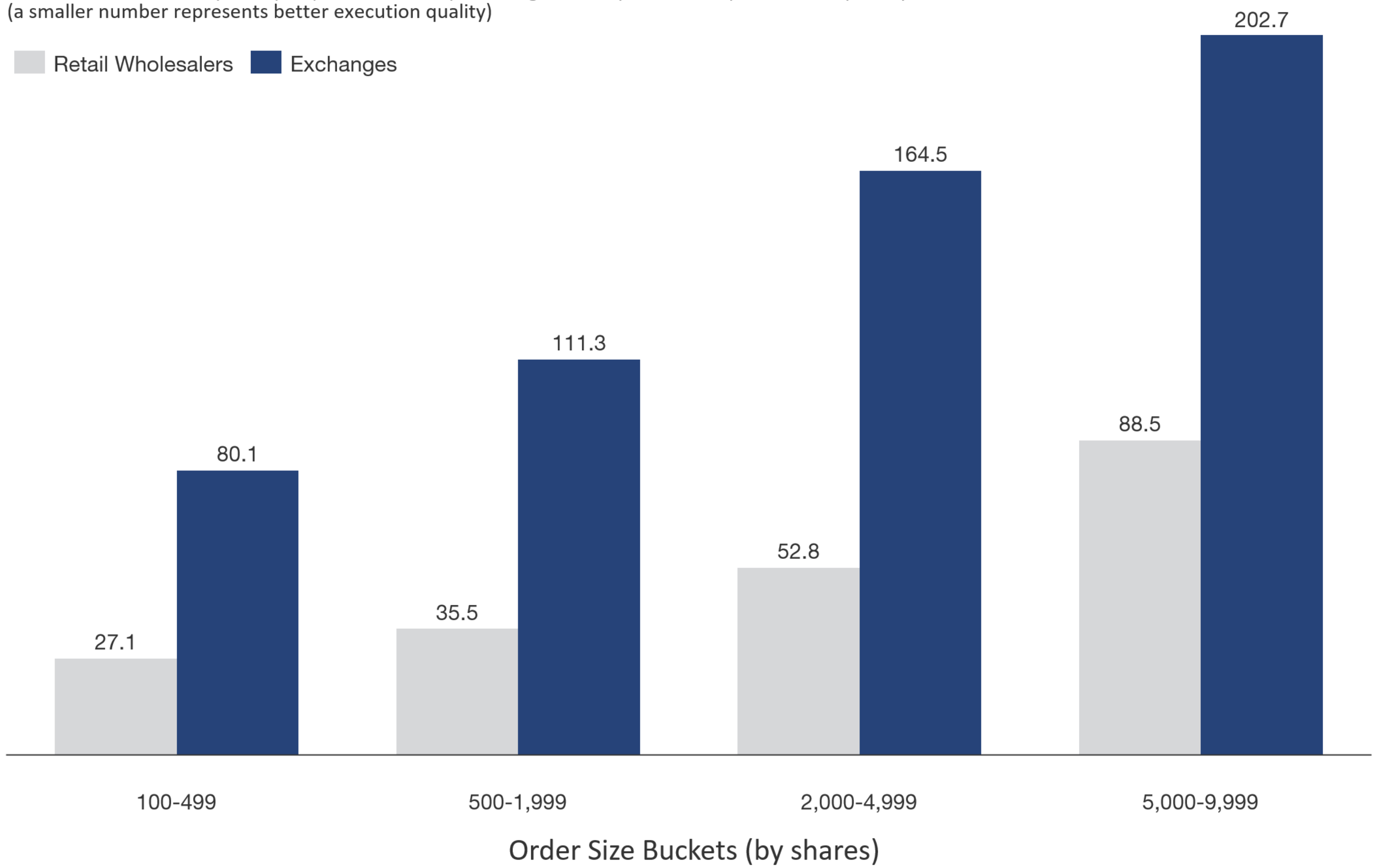
Retail Effective/Quoted Results (2011 – 2022)



Data is from SEC Rule 605 filings and covers market orders in NMS securities (100-9,999 shares)

Effective/Quoted Spread (Market Orders)

Effective over Quoted Spread (E/Q) measures the percentage of the quoted half-spread that is paid by an investor (a smaller number represents better execution quality)



Data is from 2022 SEC Rule 605 filings (Exchanges include NYSE, NYSE ARCA, NYSE American, NASDAQ, NASDAQ BX, NASDAQ PSX, EDGX, EDGA, BZX, BYX, MEMX, IEX)

Appendix C

Consistent with Section I.B of the main body of this letter (pages 8-15), this Appendix C further illustrates how the Commission's comparison of on-exchange and off-exchange execution quality lacks credibility, given that:

i. The Commission's Methodology Contains Obvious Errors That Skew the Comparison in Favor of On-Exchange Executions

ii. Focusing on Retail Orders Results in the Opposite Conclusion

iii. Retail Investors Trade Under a Wider Range of Quoted Spreads

iv. Realized Spread Has Inherent Biases That Skew Results in Favor of On-Exchange Executions

   1. Realized Spread Does Not Consider the Actual Exit Trade
   2. Realized Spread Does Not Consider Fixed or Variable Costs
   3. Realized Spread Cannot Compare a Large "Parent" Order With Smaller "Child" Orders
   4. Realized Spread Does Not Consider the Price Impact-Mitigating Effects of Principal Liquidity

Appendix C

i. The Commission's Methodology Contains Obvious Errors That Skew the Comparison in Favor of On-Exchange Executions

The Commission's methodology to translate differences in "realized spreads" to absolute dollars "saved" contains obvious errors that dramatically inflate its estimate

- Even assuming, as the Commission incorrectly does, that short-term "realized spreads" can be used to measure the differences in profitability between exchange participants and wholesalers, the Commission nevertheless *incorrectly* computes the total dollars it claims could be saved

- After correcting the Commission's accounting, using data from the Proposal and based on the Commission's own logic, **the purported savings would be less than $400 million, not $1.5 billion**

Purported "Competitive Shortfall"	$1,500,000,000	Explanations
Correcting for the Commission not using actual market volumes	- $289,000,000	• The Proposal estimates total 2022 market volume by multiplying Q1 2022 volume by four. • Actual 2022 market volume was significantly lower.
Correcting for the Commission incorrectly estimating the number of retail orders that would actually be sent to an auction	- $573,000,000	• The Proposal requires retail marketable orders that are not internalized at midpoint or better to be sent to an auction. • However, the Commission includes many more retail orders, such as retail orders that receive midpoint or better and non-marketable limit orders, to inflate the purported savings to retail investors.
Correcting for the Commission only adjusting the figures for PFOF on-exchange (i.e. exchange rebates), but not off-exchange	- $255,000,000	• The Commission arrives at the final purported profitability differential by adjusting for PFOF when calculating on-exchange liquidity provider profitability, but not doing so for wholesalers.
Revised Total	**$383,000,000**	

ii. Focusing on Retail Orders Results in the Opposite Conclusion

The Commission incorrectly combines *retail* and *institutional* orders when computing its purported "competitive shortfall" estimate

- Using data that reflects only *retail* orders results in the alleged $1.5 billion savings **becoming a $2.4 billion loss**

- The Commission claims wholesalers (WH) make more money than exchange participants (EX) because the Commission's estimates of realized spreads for WH are 0.99 bps greater than for EX (0.61 > -0.38).
- The SEC then scales this difference to reach its conclusion that retail investors could save $1.5 billion *if their order flow were moved to exchanges.*

- However, the Commission has used results that combine two different types of order flow -- *retail* and *institutional.*
- This is because over 80% of all retail flow is in the form of market orders, NOT marketable limit orders.
- To properly compare realized spreads for retail orders, you must use the data from the market column.

- Here we see that realized spreads for WH are actually 2.01 bps less than for EX (0.39 < 2.40).
- Scaling this to dollars using the SEC's methodology translates to a loss of $2.4 billion to retail investors if all their order flow were required to be traded on exchanges.

Table 5: Comparison of Rule 605 Execution Quality Statistics Between Exchanges and Wholesalers for NMS Common Stocks and ETFs in Q1 2022

	Combined Marketable Orders		Market		Marketable Limit	
	WH	EX	WH	EX	WH	EX
Average Price	$47.89	$58.14	$56.19	$85.45	$30.66	$58.08
Share Volume (billion shares)	106.97	179.49	72.20	0.39	34.77	179.10
Dollar Volume (billion $)	$5,122.91	$10,436.02	$4,056.85	$33.53	$1,066.06	$10,402.49
Fill Rate (%)	69.32%	25.77%	99.79%	58.08%	34.81%	25.77%
Effective Spread (bps)	1.81	2.06	1.47	3.29	3.11	2.06
Realized Spread (bps)	0.61	-0.38	0.39	2.40	1.43	-0.39
Price Impact (bps)	1.20	2.44	1.08	0.90	1.68	2.45
E/Q ratio	0.48	1.01	0.40	1.65	0.83	1.01
Pct of Shares Price Improved	83.17%	8.78%	88.99%	15.95%	61.01%	8.75%
Conditional Amount of Price Improvement (bps)	2.17	1.50	2.33	1.92	1.24	1.50

Appendix C

iii. Retail Investors Trade Under a Wider Range of Quoted Spreads

Any comparison of "realized spreads" must account for the fact that unlike many professional traders, retail investors trade under a wider range of market conditions, *including when "quoted spreads" are wide*[1]

Table 6: Rule 605 Wholesaler (WH) and Exchange (EX) Orders under $200,000 for Q1 2022 by Security Type

	All NMS Stocks
Average Price	$33.99
WH Share Volume (billion shares)	96.51
WH Dollar Volume (billion $)	$3,280.03
EX Share Volume (billion shares)	172.08
EX Dollar Volume (billion $)	$9,025.52
WH Fill Rate (%)	69.06%
EX Fill Rate (%)	27.31%
WH Effective Spread (bps)	2.05
EX Effective Spread (bps)	3.11
WH Realized Spread (bps)	0.72
EX Realized Spread (bps)	-0.67
WH Realized Spread Adj PFOF (bps)	0.43
EX Realized Spread Adj Rebate (bps)	-0.001
WH Price Impact (bps)	1.33
EX Price Impact (bps)	3.78
WH E/Q Ratio	0.42
EX E/Q Ratio	1.00

Here the SEC estimates that WH "realized spreads" are **1.39 bps** greater than for EX (0.72 > -0.67)

But, the SEC does not compute "quoted spreads" or show their differences

However, "quoted spreads" can be estimated by dividing the Effective Spreads by the E/Q Ratios shown.

The results are:

- WH "quoted spread" = 4.88 bps
- EX "quoted spread" = 3.11 bps
- WH – EX = **1.77 bps**

- According to the SEC's data the difference in "quoted spreads" between WH and EX (**1.77 bps**) is larger than the entire difference in "realized spreads" (**1.39 bps**).
- This strongly suggests that differences in "realized spreads" between WH and EX are driven by the fact that retail investors typically trade under a wider range of market conditions than do professional traders on exchange.

1. Academic research has documented this important distinction:

"Notably, wholesalers tend to execute when the NBBOs are relatively wide, 64.92 bps vs. the exchange equivalent of 48.67 bps, a 33% difference. This difference cannot be attributed to wholesaler choices, because commercial agreements with retail brokerages do not allow wholesalers to choose what orders to execute and when. Rather, wholesalers are required to execute all orders routed to them. As such, the difference in quoted spreads must be driven by trader decisions. The difference in quoted spreads is expected given the clienteles served by wholesalers and exchanges. Many institutional trading algorithms time their activity to periods of narrow quoted spreads. When spreads are wide, they either switch from liquidity demand to liquidity supply or reduce trading altogether. Retail traders are much less likely to engage in such strategic timing. Since the metrics in Table 2 are volume-weighted, it is not surprising that liquidity-demanding exchange trades (institutional flow) tend to occur when spreads are relatively narrow."

(Dyhrberg, Anne Haubo and Shkilko, Andriy and Werner, Ingrid M., The Retail Execution Quality Landscape (March 14, 2023) at 6, available at: https://ssrn.com/abstract=4313095)

Appendix C

iv. Realized Spread Has Inherent Biases That Skew Results in Favor of On-Exchange Executions

1. Realized Spread Does Not Consider the Actual Exit Trade

Realized spread completely ignores the exit trade, both with respect to timing and price.

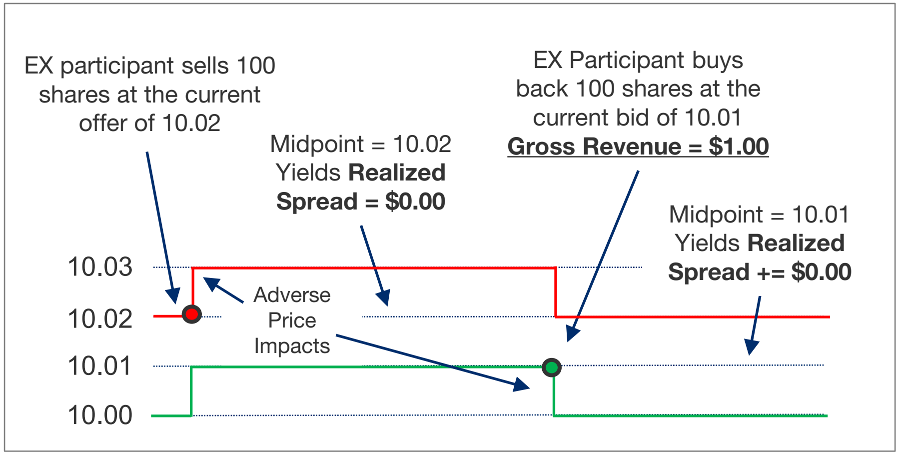
Timing

- Regardless of the time horizon used (which we note the Commission separately appears unsure of), the assumption that liquidity providers exit each position at the end of a fixed period is inconsistent with actual trading practices.
- Academic research has found that realized spread is not an accurate proxy for liquidity provider profitability due to this flaw.

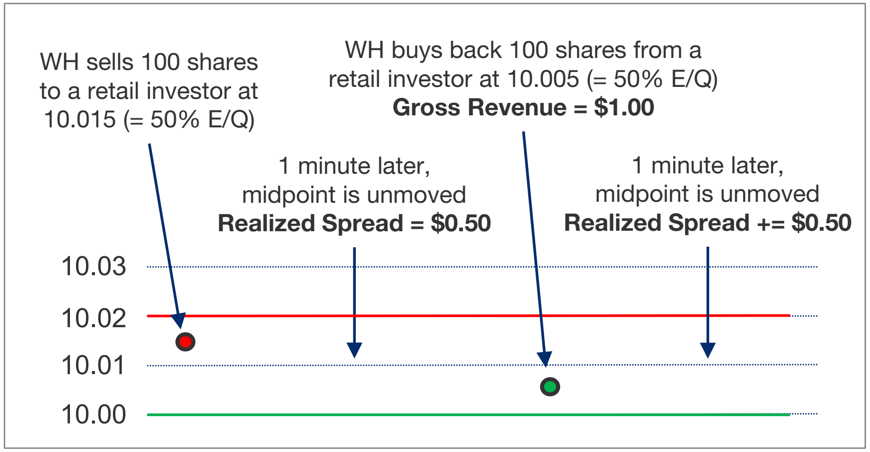
Price

- Realized spread does not consider the price (or effective spread) of the exit trade. This methodological flaw skews the results in favor of on-exchange executions, as wholesalers have much lower effective spreads.

Exchange



Wholesaler



- Using stylized examples based on data from the Proposal, we see that in both cases the EX and WH retain a gross revenue of $1.00 by buying and selling at their typical E/Q ratios.
- But the SEC would calculate the total "realized spread" for EX as $0.00 vs. the "realized spread" for WH as $1.00.

iv. Realized Spread Has Inherent Biases That Skew Results in Favor of On-Exchange Executions

2. Realized Spread Does Not Consider Fixed or Variable Costs

- Realized spread does not account for fixed or variable costs, such as trading infrastructure, personnel, exchange memberships, and market data, regulatory, and transaction fees (including fees, rebates, and PFOF).
- These costs are likely to be significantly greater for wholesalers compared to on-exchange liquidity providers due to the technology, personnel, and compliance framework required for a customer order handling business.

3. Realized Spread Cannot Compare a Large "Parent" Order With Smaller "Child" Orders

- Wholesaler execution quality data is reported at the "parent" order level.
- However, exchanges typically receive "child" orders to aggress specific price levels as part of executing an oversized order (whether from a retail or non-retail investor).
- Instead of accurately measuring on-exchange execution quality, the lower realized spreads identified by the Commission for on-exchange executions simply reflect the higher price impact associated with executing larger orders through smaller "child" slices on-exchange.

Appendix C

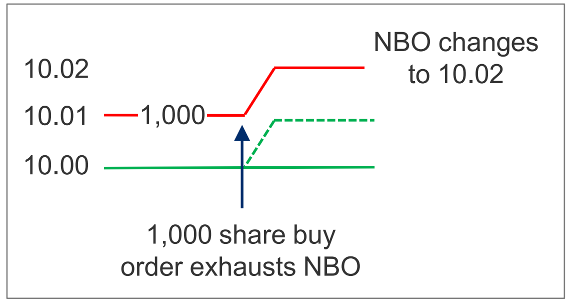
iv. Realized Spread Has Inherent Biases That Skew Results in Favor of On-Exchange Executions

4. Realized Spread Does Not Consider the Price Impact-Mitigating Effects of Principal Liquidity

The SEC's comparison of "realized spreads" between orders executed on-exchange versus off-exchange ignores the fact that the principal fills by wholesalers significantly counteract any price impact from retail orders

Exchange

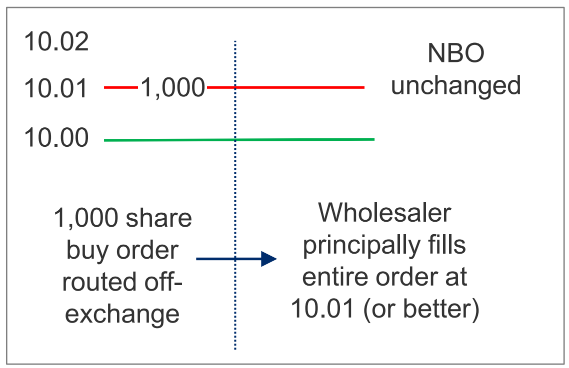
Order to buy 1,000 shares is routed to exchanges when the total size at the NBO is 1,000 shares



- This order has an instantaneous price impact that moves the midpoint by 0.5 cents resulting in **"realized spread" = 0.00**
- If NBB also moves up, the **"realized spread" would be negative**

Wholesaler

The same order to buy 1,000 shares is routed to a wholesaler that principally fills it



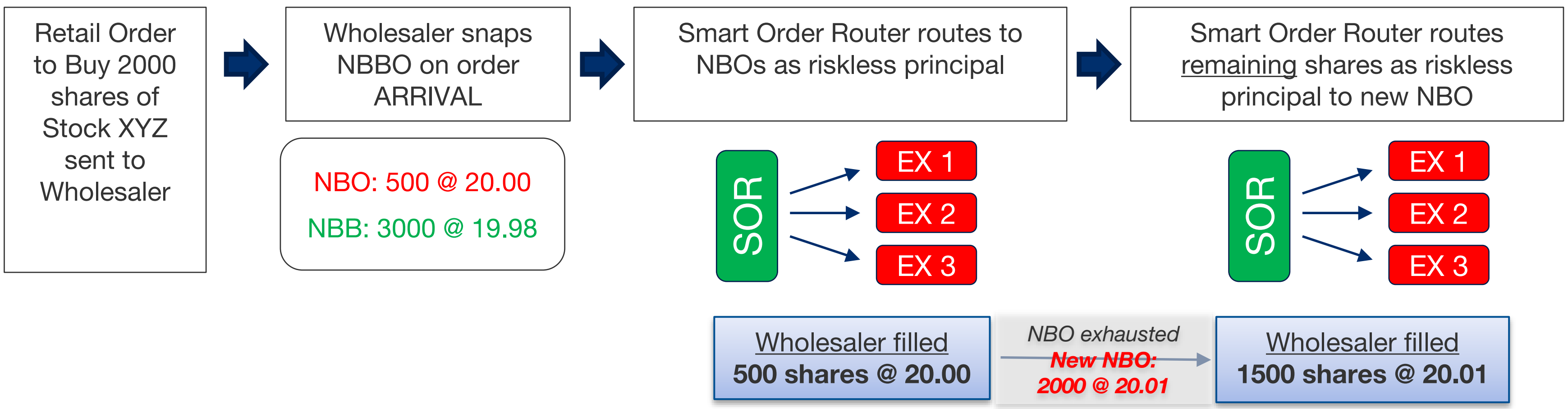
- Because the wholesaler added liquidity by filling the order as principal, there is **no** instantaneous price impact
- This results in a positive **"realized spread" = 0.5**

- **Differences in short-term "realized spreads" do not translate into differences in actual profitability.**
- **Rather, these differences can be nothing more than the result of incorrectly comparing "realized spreads" for orders that are executed against lit quotes on an exchange, versus those that are filled by wholesalers who provide additional principal liquidity.**

Appendix D

On-exchange execution quality data can look more favorable for the exact same order

- Wholesalers report execution quality metrics at the level of each parent order.
- Exchanges report at the level of each child slice.
- For a single oversized order, this can yield *two different measures of price improvement*.



Wholesaler 605 reports show completely different (worse) metrics than exchange reports for the exact same order

Each Exchange sees two Child Orders…

- **Order 1 received when NBO is $20.00**
- **Order 2 received when NBO is $20.01**

… so Exchange 605s look like this!

The Wholesaler's 605 is computed at the level of the original Parent Order

Wholesaler 605

- ❑ **E/Q Ratio: 175%**
- ❑ **At-the-Quote: 500**
- ❑ **Outside-the-Quote: 1,500**
- ❑ **Average PI = ($15.00)**

Exchange 605

- ❑ **E/Q Ratio: 100%**
- ❑ **At-the-Quote: 1,500**
- ❑ **Outside-the-Quote: 0**
- ❑ **Average PI = $0.00**