December 21, 2023

Vanessa A. Countryman
Secretary
U.S. Securities and Exchange Commission
100 F Street, NE
Washington DC, 20549
rule-comments@sec.gov

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

Dear Ms. Countryman:

Solely in my personal capacity, I would like to submit my forthcoming article titled "Order-by-Order Competition as a Regulatory Restraint on Off-Exchange Market Making: Its Historical Path and Future Outlook" in response to the proposed Order Competition Rule. I appreciate this opportunity to comment on this key market structure proposal.

Sincerely,

Stanislav Dolgopolov

December 2023
Virginia Law & Business Review (forthcoming)

Order-by-Order Competition as a Regulatory Restraint on Off-Exchange Market Making: Its Historical Path and Future Outlook

Stanislav Dolgopolov[*]

This Article looks at various regulatory approaches to order-by-order competition, which effectively serves as a regulatory restraint on the business model of off-exchange market making, as reflected in the past, present, and potential future. More specifically, this Article describes the earlier considerations of regulatory changes to enhance order-by-order competition, analyzes models of competition in the context of the current market structure and the key role played by off-exchange market makers, and assesses the approach recently proposed by the regulators, including several measures that supplement or interact with the stated goal of order-by-order competition. The Article concludes by considering the pace of regulatory change in light of the underlying complexity, challenges, and tradeoffs.

TABLE OF CONTENTS

INTRODUCTION 1
I. EARLIER CONSIDERATIONS OF REGULATORY CHANGES TO ENHANCE ORDER-BY-ORDER COMPETITION 6
II. THE CURRENT MARKET STRUCTURE AND MODELS OF COMPETITION 30
III. THE PROPOSED REGULATORY APPROACH TO IMPLEMENTING ORDER-BY-ORDER COMPETITION 62
CONCLUSION 98

INTRODUCTION

In his key speech on reforming the retail segment of the equities space in June 2022, Gary Gensler, the Chair of the U.S. Securities and Exchange Commission ("SEC"), zeroed in on the concept of order-by-order competition,[1] and the comprehensive package of market structure

[*] Chief Regulatory Officer, Decimus Capital Markets, LLC, member of the North Carolina State Bar. The author assumes sole responsibility for the views expressed in this Article and all errors. This Article draws on several blog posts by the author that previously appeared in *Medium*.

[1] Gary Gensler, Chair, the U.S. Sec. & Exch. Comm'n, Market Structure and the Retail Investor: Remarks Before the Piper Sandler Global Exchange Conference (June 8, 2022), https://www.sec.gov/news/speech/gensler-remarks-

reforms proposed later that year indeed included the Order Competition Rule that "would prohibit a restricted competition trading center from internally executing certain orders of individual investors at a price unless the orders are first exposed to competition at that price in a qualified auction operated by an open competition trading center."[2] In his earlier indications of this path, Chair Gensler had voiced an unmistakably critical perspective on competitive aspects of the business model of off-exchange market makers, commonly known as "wholesalers" or "internalizers," citing such factors as regulatory disparities for different types of market participants and industry concentration.[3] Chair Gensler's speech floated a potential regulatory solution, which later materialized in the form of the proposed Order Competition Rule:

---

piper-sandler-global-exchange-conference-060822 [https://perma.cc/Q7RG-94QD] [hereinafter Gensler, Market Structure and Retail Investor].

[2] Order Competition Rule, Exchange Act Release No. 96,495, 88 Fed. Reg. 128, 128 (proposed Dec. 14, 2022) (to be codified at 17 C.F.R. pts. 240 & 242), https://www.govinfo.gov/content/pkg/FR-2023-01-03/pdf/2022-27617.pdf [https://perma.cc/KJS8-N7RA] [hereinafter Order Competition Rule Proposal]. The other proposed rules in the same package are Disclosure of Order Execution Information, Exchange Act Release No. 96,493, 88 Fed. Reg. 3786 (proposed Dec. 14, 2022) (to be codified at 17 C.F.R. pt. 242), https://www.govinfo.gov/content/pkg/FR-2023-01-20/pdf/2022-27614.pdf [https://perma.cc/QCU3-MDGA] [hereinafter Disclosure of Order Execution Information Proposal]; Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders, Exchange Act Release No. 96,494, 87 Fed. Reg. 80,266 (proposed Dec. 14, 2022) (to be codified at 17 C.F.R. pt. 242), https://www.govinfo.gov/content/pkg/FR-2022-12-29/pdf/2022-27616.pdf [https://perma.cc/BNS5-P4CW] [hereinafter Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal]; Regulation Best Execution, Exchange Act Release No. 96,496, 88 Fed. Reg. 5440 (proposed Dec. 14, 2022) (to be codified at 17 C.F.R. pts. 240 & 242), https://www.govinfo.gov/content/pkg/FR-2023-01-27/pdf/2022-27644.pdf [https://perma.cc/SJ6N-H628] [hereinafter Regulation Best Execution Proposal].

[3] *See, e.g.*, *Oversight of the U.S. Securities and Exchange Commission: Hearing Before the S. Comm. on Banking, Hous. & Urb. Affairs*, 117th Cong. 19 (2023), https://www.govinfo.gov/content/pkg/CHRG-117shrg52997/pdf/CHRG-117shrg52997.pdf [https://perma.cc/LCB8-HT92] (remarks of Gary Gensler, Chair, the U.S. Securities and Exchange Commission) ("[I]f a party is buying all the order flow, or the bulk of order flow, then the order-by-order competition does not exist, so the retail public does not benefit from that competition. When I was growing up, you had competition. It was not modern technology[,] but it was competition on the floor of the New York Stock Exchange, and brokers could scream and yell at each other about what they were going to pay.

> [T]he vast majority of retail marketable orders are flowing to wholesalers that pay for this order flow. What's more, this segmentation means that institutional investors, such as pension funds, don't get to interact directly with that order flow. This segmentation—which isolates retail orders—may not benefit the retail public as much as orders being exposed to order-by-order competition. . . . I've asked staff to make recommendations . . . around how to enhance order-by-order competition. This may be through open and transparent auctions or other means, unless investors get midpoint or better prices. . . . I've asked staff, in considering any recommendations for stock auctions, to draw upon lessons from the options market, focusing on assuring full competition among all market participants to provide the best prices for retail investors.[4]

The thrust of order-by-order competition, as described by Chair Gensler, is undoubtedly an outgrowth of the ongoing debate on the business model of off-exchange market making. Notably, the nuances of this debate, including order flow arrangements between customer-facing brokerage firms and wholesalers that often involve the practice of payment for order flow ("PFOF"), even reached the U.S. Congress, with the "meme stocks" retail trading frenzy of the

---

Now if one party is buying literally half the retail order flow in America of these market orders, that could actually have diminished competition in the marketplace."); Gary Gensler, Chair, the U.S. Sec. & Exch. Comm'n, Prepared Remarks at the Global Exchange and FinTech Conference (June 9, 2021), https://www.sec.gov/news/speech/gensler-global-exchange-fintech-2021-06-09 [https://perma.cc/R4EC-BAY5] [hereinafter Gensler, Prepared Remarks at the Global Exchange and FinTech Conference] ("[W]holesalers have many advantages when it comes to pricing compared to exchange market makers. The two types of market makers are operating under very different rules. Exchange market makers, for example, must compete with each other on an order-by-order basis to offer the best price. Wholesalers are able to price their segmented order flow simply by referencing the NBBO [National Best Bid and Offer], which is a much less competitive benchmark. Now, let me add a second observation. Within the off-exchange market maker space, we are seeing concentration. One firm has publicly stated that it executes nearly half of all retail volume.").

[4] Gensler, Market Structure and Retail Investor, *supra* note 1. This approach had been suggested by at least one other top regulator in the past. *See* Luis A. Aguilar, Comm'r, the U.S. Sec. & Exch. Comm'n, U.S. Equity Market Structure: Making Our Markets Work Better for Investors (May 11, 2015), http://www.sec.gov/news/statement/us-equity-market-structure.html [https://perma.cc/J9M8-SYU5] ("[T]he Commission should explore ways of exposing off-exchange trades to more competition. One possibility is to require trades negotiated in dark pools and with internalizers to be exposed to the exchanges for potential price improvement. This would essentially set up an auction process that would directly benefit investors, and could potentially enhance displayed liquidity." (citing HAIM BODEK, THE PROBLEM OF HFT: COLLECTED WRITINGS ON HIGH FREQUENCY TRADING & STOCK MARKET REFORM 69 (2013) (endnote omitted)).

early months of 2021 being one of the focal points of this scrutiny.[5] Moreover, the four proposals in the comprehensive package of market structure reforms,[6] in addition to being a major restructuring of the equities space, probably serve as the SEC's most comprehensive regulatory assessment of the business model and practices of off-exchange market makers.

Even before Chair Gensler's speech, an executive of a leading wholesaler expressed a critical view of the rumored direction: "Order-by-order competition enables selective competition because it removes the retail brokers' ability to demand best execution from wholesalers on every order."[7] This criticism mixes up the duty of best execution and the

---

[5] For several key congressional materials relating to this debate on the business model of off-exchange market making, see *Who Wins on Wall Street? GameStop, Robinhood, and the State of Retail Investing: Hearing Before the Subcomm. on Sec. of the S. Comm. on Banking, Hous. & Urb. Affairs*, 117th Cong. (2022), https://www.govinfo.gov/content/pkg/CHRG-117shrg46082/pdf/CHRG-117shrg46082.pdf [https://perma.cc/72VH-QBVT] [hereinafter *GameStop Senate Hearing*]; *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part I: Virtual Hearing Before the H. Comm. on Fin. Servs.*, 117th Cong. (2022), https://www.govinfo.gov/content/pkg/CHRG-117hhrg43966/pdf/CHRG-117hhrg43966.pdf [https://perma.cc/ZNF2-D4L6] [hereinafter *Game Stopped House Hearings, Part I*]; *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part II: Virtual Hearing Before the H. Comm. on Fin. Servs.*, 117th Cong. (2021), https://www.govinfo.gov/content/pkg/CHRG-117hhrg44343/pdf/CHRG-117hhrg44343.pdf [https://perma.cc/QQ53-T6BZ]; *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III: Virtual Hearing Before the H. Comm. on Fin. Servs.*, 117th Cong. (2021), https://www.govinfo.gov/content/pkg/CHRG-117hhrg44837/pdf/CHRG-117hhrg44837.pdf [https://perma.cc/Y4GN-XWNR]; MAJORITY STAFF OF THE H. COMM. ON FIN. SERVS., 117TH CONG., GAME STOPPED: HOW THE MEME STOCK MARKET EVENT EXPOSED TROUBLING BUSINESS PRACTICES, INADEQUATE RISK MANAGEMENT, AND THE NEED FOR LEGISLATIVE AND REGULATORY REFORM (Comm. Print 2022), https://financialservices.house.gov/uploadedfiles/6.22_hfsc_gs.report_hmsmeetbp.irm.nlrf.pdf [https://perma.cc/GU77-WC22].

[6] Disclosure of Order Execution Information Proposal, *supra* note 2; Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2; Order Competition Rule Proposal, *supra* note 2; Best Execution Rule Proposal, *supra* note 2.

[7] Lydia Beyoud & Katherine Doherty, *SEC Weighs Sending Retail Stock Orders to Auctions for Execution*, BLOOMBERG (June 6, 2022), https://www.bloomberg.com/news/articles/2022-06-06/sec-weighs-sending-retail-stock-orders-to-auctions-for-execution (quoting Douglas Cifu, Chief Executive Officer, Virtu Financial, Inc.).

economics of execution services. Although the proposed regulatory approach is likely to change the underlying economics and produce a disparate effect on certain types of orders, customers, and liquidity providers, the duty of best execution applies to each order regardless of the applicable market structure. As codified by the Financial Industry Regulatory Authority ("FINRA"), this fundamental duty extends to "any transaction for or with a customer or a customer of another broker-dealer" in the context of order handling,[8] and the duty of best execution unambiguously applies to both customer-facing brokers and off-exchange market makers in the execution chain.[9] While FINRA has distinguished between the standards of "a regular and rigorous review" and "an order-by-order review" for the purposes of complying with the duty of best execution, with the latter standard applying to internalized and certain larger-sized orders,[10] the concept of order-by-order competition has a different meaning. The most logical interpretation of this concept lies in some form of exposure of each order for potential interaction with various market participants as a means to inject additional competition.

Ultimately, the practical challenge for a regulatory solution aiming at order-by-order competition is to craft a set of straightforward marketwide rules, as opposed to the highly discretionary and complex process of complying with the duty of best execution.[11] Accordingly,

---

[8] *5310. Best Execution and Interpositioning*, FINRA, https://www.finra.org/rules-guidance/rulebooks/finra-rules/5310 [https://perma.cc/V7YN-2Z3K] (the last amendment effective as of May 9, 2014) [hereinafter FINRA Rule 5310] (cl. (a)(1)).

[9] Stanislav Dolgopolov, *Wholesaling Best Execution: How Entangled Are Off-Exchange Market Makers?*, 11 VA. L. & BUS. REV. 149, 173–76 (2016), https://ssrn.com/abstract=2744904.

[10] FIN. INDUS. REGUL. AUTH., INC., REGULATORY NOTICE NO. 15-46, BEST EXECUTION 3–4 (Nov. 2015), http://www.finra.org/sites/default/files/notice_doc_file_ref/Notice_Regulatory_15-46.pdf [https://perma.cc/M4FZ-CG6Q].

[11] This traditional nature of the duty of best execution is evident from FINRA's rule on best execution that mandates such non-mechanical concepts as "reasonable diligence to ascertain the best market," "regular and rigorous review," and "order-by-order review." FINRA Rule 5310, *supra* note 8 (cl. (a)(1)) & (Supplementary Material .09 Regular

this Article looks at various regulatory approaches to order-by-order competition, which effectively serves as a regulatory restraint on the business model of off-exchange market making, as reflected in the past, present, and potential future. More specifically, this Article describes the earlier considerations of regulatory changes to enhance order-by-order competition, analyzes models of competition in the context of the current market structure and the key role played by off-exchange market makers, and assesses the approach recently proposed by the regulators, including several measures that supplement or interact with the stated goal of order-by-order competition. The Article concludes by considering the pace of regulatory change in light of the underlying complexity, challenges, and tradeoffs.

I. Earlier Considerations of Regulatory Changes to Enhance Order-by-Order Competition

Seeking a regulatory fix to enhance order-by-order competition signifies the SEC's return to its old stomping grounds over the course of several decades, and the regulatory agency's concerns over the business model of off-exchange market making is hardly a new phenomenon. Moreover, revisiting some of the regulatory landmarks may enhance the understanding of the current policy debates. As an introduction, one may look at the congressional hearings held back in 1974 on the regulatory framework for the "third market" in exchange-listed securities populated by off-exchange market makers and the SEC's authority over that marketplace.[12]

---

and Rigorous Review of Execution Quality)). Moreover, "[b]ecause the scope of the duty of best execution is constantly evolving and because the 'reasonably available' component of the duty is fact dependent, broker-dealers have long been required to conform customer order practices with changes in technology and markets." Newton v. Merrill, Lynch, Pierce, Fenner & Smith, Inc., 135 F.3d 266, 271 (3d Cir. 1998).

[12] *SEC Authority Over Third Market Trading: Hearings Before the Subcomm. on Sec. of the S. Comm. on Banking, Hous. & Urb. Affairs*, 93d Cong. (1974), https://books.google.com/books?id=c6gQAAAAIAAJ [hereinafter *Senate*

These hearings from almost five decades ago, while held with the epic unfolding of the fixed brokerage commissions regime on securities exchanges in the background, demonstrate the persistence of such key issues as potential regulatory restrictions on off-exchange trading in light of various conjectures about its impact, concerns about uneven regulation of securities exchanges and off-exchange market makers as competing trading venues, and impediments to interaction of retail and institutional order flow.[13]

With respect to the last item on the list, it should be noted that Chair Gensler's speech specifically acknowledged the concern that "institutional investors, such as pension funds, don't get to interact directly with [retail] order flow."[14] Currently, this concern is often framed by some stakeholders, notably including some voices from the institutional investor community, as the one of "inaccessible liquidity," given the existence of segmentation that constrains direct interaction of institutional order flow with "safer" retail order flow.[15] Intriguingly, that concern was turned on its head back in 1974: the underlying problem was that retail order flow going directly to securities exchanges could not directly interact with institutional order flow going through off-exchange market makers. As formulated by John J. Needham, the Chairman of the Board of Directors of the New York Stock Exchange ("NYSE"), "[W]hy won't the third markets

---

Hearings on SEC Authority Over Third Market Trading]. For a discussion of the preceding debates on potential restrictions on the third market and the place of off-exchange market makers in the envisioned "central market system," which involved the securities industry, the regulators, and the legislators, see SUBCOMM. ON SEC. OF S. COMM. ON BANKING, HOUS. & URB. AFFAIRS, 93D CONG., SECURITIES INDUSTRY STUDY 93–96, 101–04, 119–26 (Comm. Print 1972), https://books.google.com/books?id=9OHPAAAAMAAJ.

[13] *Senate Hearings on SEC Authority Over Third Market Trading*, *supra* note 12, *passim.*

[14] Gensler, Market Structure and Retail Investor, *supra* note 1.

[15] For a description of this concern and its implications for competition and price discovery, see Stanislav Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations: An Evolving Mixture of Market Reform, Regulatory Enforcement, and Litigation*, 17 NYU J.L. & BUS. 477, 544 & n.255 (2021), https://www.nyujlb.org/_files/ugd/716e9c_cc8ee2b23fd642f1a83ad978cc1a9eba.pdf [https://perma.cc/VMG4-7LK5] [hereinafter Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations*].

firms let the investing public, the little guy get in on these trades?"[16] This comment triggered a sarcastic remark by none other than Senator Joseph Biden: "Your concern for the little guy is admirable."[17] Similarly, NYSE Chairman Needham articulated the argument about the exclusivity and secrecy of transactions between off-exchange market makers and institutional investors: "The primarily institutional third market has little, if any, individual participation. . . . All of these transactions between dealers and institutions take place in the privacy of the dealer's office—or, if you will, in secret."[18] In response, Donald E. Weeden of Weeden & Co., probably the most prominent off-exchange market maker at the time, stated than a significant portion of his firm's trading was attributed to "broker-dealers who are dealing directly with and servicing the small public investor."[19] In any instance, it had been recognized long before these hearings that institutional investors were especially drawn to the third market because of the existence of the fixed brokerage commissions regime on securities exchanges, given such characteristics of the commission structure as "[the lack of a] graduated discount for the larger transactions in which they tend to deal [and the bundling of] the cost of services other than the basic brokerage

[16] *Senate Hearings on SEC Authority Over Third Market Trading*, *supra* note 12, at 94. As more vividly described by an industry group's representative, "[W]hen a third market firm purchases that block of stock . . . Aunt Jenney in Chattanooga [trading on a securities exchange] is not able to participate in that transaction." *Id.* at 76 (remarks of H. Virgil Sherrill, member of the Executive Committee, the Board of Directors, and the Governing Council, the Securities Industry Association).

[17] *Id.* at 94.

[18] *Id.* at 80.

[19] *Id.* at 135. The phenomenon of order flow arrangements between off-exchange market makers and other broker-dealers representing their own customers had been documented much earlier. *See, e.g.*, U.S. SEC. & EXCH. COMM'N, REPORT OF SPECIAL STUDY OF SECURITIES MARKETS, H.R. Doc. No. 88-95, pt. 5, ch. VIII(D), at 139 (1963), https://books.google.com/books?id=timLsce47vQC [hereinafter SEC'S 1963 SPECIAL STUDY] ("Some market makers specialize in business with institutions, some with broker-dealers, and some with a combination of both. The securities traded include not only institutional favorites but many which may be considered popular primarily with individuals. The range of transaction size shows a preponderance of large deals but also a surprisingly high percent of odd lots, apparently transacted by broker-dealers for individual public customers.").

function—services often of little interest or value to an institution."[20] Not surprisingly, "the off-board market maker ha[d] considerable latitude in quoting prices to institutions net of commissions that [were] better than the combination of Exchange price and commission."[21]

Referring to the SEC's authority to ban the third market as the lynchpin of the proposed legislation, NYSE Chairman Needham specifically referred to the significance of the all-to-all nature of exchange markets as "combin[ing] the elements of fairness, orderliness, full disclosure and equal treatment": "[T]he central issue addressed by the bill is whether the orders of public investors in listed stocks should be exposed to all other orders of public investors in these stocks."[22] Moreover, when questioned by Senator Biden, he explicitly stated that "[t]he third market shouldn't exist," citing his concerns about fragmentation of trading as being "detrimental to the public interest."[23] In turn, Senator Biden offered an amusing analogy, which nevertheless conveyed a key point about winners and losers created by anti-fragmentation rules:

> If I own half the pie and you own half the pie, it is fragmented. If I want your half to be coupled up with my half on my table[,] we are bringing it together. If you want my half coupled up with your half on your table[,] we are bringing it together, too. We have a central pie, all whole and full. It all depends on whose table it is on.[24]

Likewise, Senator Biden expressed the view that the third market served as "a competitive force to stock exchange specialists [i.e., on-exchange designated market makers]."[25] As conveyed by SEC Chairman Ray Garrett, Jr., the regulatory agency itself appeared to be interested in having the flexibility to restrict off-exchange trading, if that explicit authority were to be offered, but did

---

[20] SEC's 1963 SPECIAL STUDY, *supra* note 19, pt. 5, ch. VIII(D), at 140, https://books.google.com/books?id=timLsce47vQC.

[21] *Id.*

[22] *Senate Hearings on SEC Authority Over Third Market Trading*, *supra* note 12, at 80.

[23] *Id.* at 95.

[24] *Id.* at 97.

[25] *Id.* at 33.

not expect this measure to be an absolute necessity.[26] As "[t]he least disruptive action," the SEC considered the possibility of mandating off-exchange market makers "to expose all of their business to the specialist's book to give the public an opportunity to participate in their trades," while maintaining that such an approach "could be anticompetitive."[27]

Another key historical episode relates to the relaxation of off-board trading restrictions on exchange members by the SEC in the mid-1970s – early 1980s.[28] For instance, the regulatory agency labeled the adoption of Rule 19c-3 in 1980 as "the opportunity for competition between the over-the-counter and exchange markets with concomitant benefits to investors."[29] At the same time, the SEC acknowledged the concern about "'internalization' by broker-dealer firms with large retail order flow or sizable correspondent networks," meaning that such order flow would not be "expos[ed] to buying and selling interest in . . . other market centers."[30] Notably, the regulatory agency described the argument advanced by some commenters that "large integrated firms would find it in their economic self-interest to execute their retail order flow 'in-house,' and that, as a result, specialists and other market makers would not have the opportunity to compete for that order flow" and the corresponding policy prescription that "the only way to rectify this competitive disadvantage was to require integrated firms, through intermarket linkage

[26] *Id.* at 18–21, 26–29.

[27] *Id.* at 30, 33.

[28] For a discussion of the relevant rules adopted or contemplated by the SEC, see Deferral of an Order Exposure Rule, Exchange Act Release No. 20,074, 48 Fed. Reg. 38,250, 38,250–51 (Aug. 12, 1983), https://archives.federalregister.gov/issue_slice/1983/8/23/38247-38252.pdf [https://perma.cc/SM4Z-UCCK] [hereinafter Deferral of an Order Exposure Rule].

[29] Off-Board Trading Restrictions, Exchange Act Release No. 16,888, 45 Fed. Reg. 41,125, 41,126 (June 11, 1980) (codified at 17 C.F.R. § 240.19c-3), https://archives.federalregister.gov/issue_slice/1980/6/18/41124-41135.pdf [https://perma.cc/K3GH-A56P] [hereinafter Off-Board Trading Restrictions and Rule 19c-3 Adoption].

[30] *Id.* at 41,128 & n.31.

systems, to ‘expose’ their retail order flow to other competing market makers.”[31] On the other hand, the SEC also acknowledged the argument that internalization would be “perfectly appropriate if conducted on the basis of ‘quote matching,’ *i.e.*, providing an execution in one market center at a price equal to the best price displayed in the consolidated quotation system” and that “retention of order flow by a market center did not raise competitive concerns if . . . the customer is given a price which is equal to or better than the best price available in any other market.”[32] The practice of quote matching in *both* off-exchange and on-exchange trading was already common, as evidenced by the regulatory agency’s recognition that

> [o]rders sent to regional exchanges or the third market are often executed in those markets without any intermarket exposure, either because they are executed there as a result of previously negotiated price protection against transactions in the “primary” market or because they are executed, on an automated basis, based on a derivative pricing formula.[33]

Likewise, the SEC also expressed its concern about certain features of the Intermarket Trading System (“ITS”), the linkage architecture sanctioned by the regulators, that “may serve only to encourage price matching rather than intermarket order exposure.”[34] These observations of the marketplace’s realities also offered a stark contrast to the regulators’ earlier vision of an off-exchange marketplace and its interaction with securities exchanges as driven by displayed liquidity and quote-based competition:

> [E]ach market maker’s bids and offers would have to be competitive in terms of price and size compared to the prices and sizes of other market makers’ bids and offers in order to ensure a regular flow of order inquiry; failure to maintain a competitively priced market of reasonable depth would be penalized by a loss of orders . . . . Spreads, the differences between market makers’ bid and asked prices, should be narrowed as the bids and offers of various market makers

---

[31] *Id.* at 41,128.

[32] *Id.*

[33] *Id.* at 41,129.

[34] *Id.* at 41,130.

compete with each other to attract order flow and opportunities to achieve executions.[35]

The SEC acknowledged the concern that some order exposure rule might be desirable and stated that it could be accomplished through "a trading system which provides an opportunity for interaction of order flow and exposure to other over-the-counter and exchange market makers," perhaps combined with some minimum exposure time.[36] Moreover, in the course of the rulemaking process, the focus of the regulators and various stakeholders was on retail orders and the underlying order flow relationships, often in the context of off-exchange trading,[37] which probably reflected the evolution of the marketplace in the aftermath of the abolition of the fixed brokerage commissions regime on securities exchanges.[38]

In due course, the SEC proposed two versions of such an order exposure rule in 1982.[39] These alternative rules would have covered either only off-exchange market makers or both off-exchange market makers and exchange specialists, given the regulatory agency's concern that, under certain circumstances, an exchange specialist could be "in a competitive position

---

[35] Off-Board Trading by Members of National Securities Exchanges, Exchange Act Release No. 11,942, 41 Fed. Reg. 4507, 4512 (Dec. 19, 1975) (codified at 17 C.F.R. § 240.19c-1), https://archives.federalregister.gov/issue_slice/1976/1/30/4507-4528.pdf [https://perma.cc/Q9EX-PYBA] [hereinafter Off-Board Trading and Rule 19c-1 Adoption]. In that context, the SEC also stressed the importance of "a communications tool such as a composite quotation system, reflecting firm bids and offers by all market makers [as] a prerequisite to the kind of competitive interaction which guarantees achievement of the benefits expected of 'fair competition' among market makers." *Id.* at 4513.

[36] Off-Board Trading Restrictions and Rule 19c-3 Adoption, *supra* note 29, at 41,128–29.

[37] *Id.* at 41,128–31.

[38] For a discussion of the distortionary impact on the fixed brokerage commissions regime on securities exchanges on institutional trading, see Stanislav Dolgopolov, *Insider Trading, Chinese Walls, and Brokerage Commissions: The Origins of Modern Regulation of Information Flows in Securities Markets*, 4 J.L. ECON. & POL'Y 311 *passim* (2008), https://ssrn.com/abstract=897180.

[39] Order Exposure Rules, Exchange Act Release No. 18,738, 47 Fed. Reg. 22,376 (proposed May 13, 1982) (to be codified at 17 C.F.R. § 240.11A-1), https://archives.federalregister.gov/issue_slice/1982/5/24/22375-22387.pdf [https://perma.cc/75E3-ZNKL] [hereinafter Order Exposure Rules Proposal].

comparable to an upstairs firm because no other market participant can successfully attract [directed] orders from him [especially] with respect to orders which are routed through the various exchange small order processing systems directly to the specialist."[40] The gist of the order exposure mechanism for these alternative rules was as follows: "[A] firm would be required publicly to bid or offer the customer order at an eighth [i.e., one tick size / one minimum price increment] better than its proposed execution price, which must equal the best prevailing quotation to avoid a trade-through, in order to elicit any interest at that better price from other market centers."[41] Such orders would have been "stopped," i.e., guaranteed to be executed by market makers at the "intended execution price," meaning that "the stop price would have to be at least as good as the best price then available in any participating ITS market," and then exposed to the marketplace for sixty seconds.[42] On the other hand, the SEC expressed the concern that "the market may move adversely to the broker-dealer during the time of the stop."[43]

In support of this measure, the regulatory agency stated that "market makers would for the first time be able to compete aggressively for other markets' order flow, offering the possibility of the development of vigorous intermarket competition, with possible resultant benefits for the quality of the markets" and maintained that the proposal "could benefit public customers by requiring affirmative efforts on behalf of customer orders, augmenting those owned pursuant to a firm's fiduciary best execution responsibility."[44] Moreover, the SEC had

---

[40] *Id.* at 22,380–82.

[41] *Id.* at 22,380.

[42] *Id.* at 22,380–81 & n.37. As an alternative to exposing orders in this manner, such orders could have been "exported," i.e., entered, into the Computer Assisted Execution System maintained by the National Association of Securities Dealers, allowing for a potential execution by the same firm, subject to the existence of informational barriers. *Id.* at 22,381.

[43] *Id.* at 22,383.

[44] *Id.* at 22,380.

recognized that "an anti-internalization measure involving order exposure requirements [could be justified] on grounds distinct from the question of whether [it was] necessary to eliminate potential overreaching by OTC [over-the-counter] market makers."[45]

The alternative order exposure rules attracted a significant amount of attention from various stakeholders, yielding a number of arguments for and against this measure.[46] The comments in favor of the proposed rule asserted, among other things, that it "would tend to promote the maximum interaction of orders," "could encourage heightened intermarket competition for these securities, resulting in improved executions for customers overall," "would reduce concerns about unfair competition for order flow initially directed to one market or market-maker," "eliminate the market maker's complete control over its customer orders," and "would tend to correct pricing inefficiencies introduced by market fragmentation."[47] Interestingly, the SEC also noted a particular concern expressed by institutional investors:

---

[45] *Id.* The SEC defined "overreaching" as the scenario of "broker-dealer firms taking advantage of their customers by executing retail transactions as principal at prices [less] favorable to those customers than could have been obtained had those firms acted as agent." *Id.* at 22,377 n.8. The regulatory agency also articulated earlier that "the existence of [the] fiduciary relationship [between broker-dealers and their clients] should, as a legal matter, reduce the risks of overreaching in connection with over-the-counter trading by integrated firms." Off-Board Trading Restrictions and Rule 19c-3 Adoption, *supra* note 29, at 41,130. On the other hand, the SEC had acknowledged the argument that, "if large retail firms are permitted to integrate their functions as agent and upstairs market maker in particular listed securities . . . the temptations and opportunity for such firms to engage in overreaching will prove irresistible" and contemplated alternative rules to address the problem of overreaching. Off-Board Trading Restrictions, Exchange Act Release No. 13,662, 42 Fed. Reg. 33,510, 33,519, 33,525 (proposed June 23, 1977) (to be codified at 17 C.F.R. §§ 240.19c-1, 240.19c-2 & 250.15c5-1), https://archives.federalregister.gov/issue_slice/1977/6/30/33479-33524.pdf [https://perma.cc/6CTK-RTM2] [hereinafter Off-Board Trading Restriction Rule Proposals].

[46] Reproposal of an Order Exposure Rule, Exchange Act Release No. 19,372, 47 Fed. Reg. 58,287, 58,290–91 (proposed Dec. 23, 1982) (to be codified at 17 C.F.R. § 240.11A-1), https://www.govinfo.gov/content/pkg/FR-1982-12-30/pdf/FR-1982-12-30.pdf [https://perma.cc/2UGE-KCRC] [hereinafter Reproposal of an Order Exposure Rule].

[47] *Id.* at 58,290.

> The role of order exposure in preserving the integrity of the market's pricing mechanism was of particular note to commentators representing institutional investors, because of the importance of the pricing function to institutions in accumulating and disposing of stocks for themselves and on behalf of clients. . . . [T]hey [also] argued that the importance of true and current quotations reflecting total supply and demand for a security required more extensive exposure of orders.[48]

By contrast, the critics of the proposal maintained that "Commission and industry monitoring had not revealed any harm to the securities markets resulting from off-board trading" and took the position that "the numerous mechanical steps involved in exposing an order would render the efficient execution of off-board principal transactions virtually impossible [meaning] that in practice the rules would be unworkable and anticompetitive."[49]

While retaining the nature of the order exposure mechanism, the SEC revised the proposal to reduce the applicable time period to thirty seconds and to "cover all broker-dealers trading as principal with their customers in Rule 19c-3 linked securities, including off-board market makers, exchange specialists, and broker-dealers on the floor of an exchange,"[50] specifically extending its reach to "all automated and derivative execution systems, including both regional exchange automated execution systems and derivative execution systems."[51] Moreover, the regulatory agency incorporated several exceptions to the order exposure

---

[48] *Id.* at 58,291.

[49] *Id.*

[50] *Id.* at 58,292–93. The SEC also made the following conclusion about the coverage of the proposed rule, accompanied by some reservations about its need: "[I]f such a rule were to be applied . . . it should be applied in an attempt to obtain the potential benefits of order exposure by all markets—increased opportunities for best execution, enhanced interaction of orders, and additional opportunities for competition—rather than in an attempt to address speculative overreaching and other concerns associated only with OTC market makers interacting with so called internalized customer orders." *Id.* at 58,292. Moreover, the regulatory agency did not see "any objectively identifiable negative impacts of internalization on Rule 19c-3 trading in the past that would justify imposition of an order exposure rule." *Id.*

[51] *Id.* at 58,293.

requirements that were "designed to assure that trading continuity is not disrupted, even during periods of active trading," including the goal of avoiding unnecessary trading delays,[52] as well as "a number of additional exclusions for circumstances where the Rule's order exposure or export requirements would appear to provide little benefit or where requiring order exposure could be unduly burdensome or disruptive."[53]

Ultimately, the SEC had deferred its decision on adopting some version of an order exposure rule.[54] Indeed, one of the key considerations articulated by the regulatory agency was that the "low level of OTC trading in [Rule 19c-3] securities limit[ed] the benefits that could be achieved by an order exposure rule,"[55] and another observation dealt with the departure of several firms no longer interested in serving as off-exchange market makers in Rule 19c-3 securities.[56] On the other hand, even during the proposal process, a leading trading firm had expressed interest in adopting some form of order exposure as a matter of company policy,[57] and probably the most famous example of such a policy in the subsequent years was employed by Bernard L. Madoff Investment Securities ("BLMIS"). As described by BLMIS, it stopped market orders for at least 300 shares and exposed them for price improvement at one tick size better than the prevailing price for one minute, claiming that BLMIS's trading system was "the

---

[52] *Id.* at 58,291–92 & n.50, 58,293.

[53] *Id.* at 58,293.

[54] Deferral of an Order Exposure Rule, *supra* note 28.

[55] *Id.* at 38,252.

[56] *Id.* at 38,251–52.

[57] Reproposal of an Order Exposure Rule, *supra* note 46, at 58,292. In fact, several years before formally proposing this version of an order exposure rule, the SEC had suggested a similar mechanism as an example of voluntary "trading strategies advantageous to customers": "[F]irms prepared to buy stock as principal could, for example, offer to 'stop' a purchasing customer at a given price for a period of time and, before executing the order as principal, either (i) hold the order for execution at any better price offered by another customer during that period or (ii) represent the order during that period in a composite quotation system at a price 1/8 of a dollar above the price the dealer is offering to pay." Off-Board Trading Restriction Rule Proposals, *supra* note 45, at 33,524.

only one that exposes orders across all markets for price improvement."[58] A later description of BLMIS's price exposure process stated the following:

> Madoff's system automatically seeks price improvement opportunities for larger customer market orders (of less than block size), by exposing a better price in the NMS [National Market System] displayed quotation. Madoff provides its clients' orders with the greatest possibility of obtaining the best price available across all markets. Because the entire order is stopped and guaranteed an execution at the NBBO [National Best Bid and Offer] during the exposure process, there is no risk to a customer of receiving less than the best price. The exposure process lasts for up to thirty (30) seconds; more than enough time for other market participants to interact with our quote and establish the availability of price improvement.[59]

In 1995, the SEC proposed yet another version of an order exposure rule in conjunction with, among other things, a rule mandating display of customer limit orders.[60] The proposed "price improvement" rule would have required "each specialist or OTC market maker in a covered security that accepts a customer market order to provide that order with an opportunity for price improvement,"[61] although there was a broad exception for certain "fast market" conditions.[62] At the same time, the proposal "d[id] not specify the extent to which an opportunity

---

[58] Letter from Peter B. Madoff & Bernard L. Madoff, Bernard L. Madoff Inv. Sec., to Stephen A. Blumenthal, Minority Couns., Comm. on Energy & Com., U.S. House of Reps. 1–3 (June 16, 1994), *reproduced in Unlisted Trading Privileges: Hearing Before the Subcomm. on Telecomms. & Fin. of the H. Comm. on Energy & Com.*, 103d Cong. 151–53 (1994), https://books.google.com/books?id=6dr7ECh875UC.

[59] BERNARD L. MADOFF INV. SEC., ORDER HANDLING GUIDE 1 (Apr. 1998) (on file with author).

[60] Order Execution Obligations, Exchange Act Release No. 36,310, 60 Fed. Reg. 52,792 (proposed Sept. 29, 1995) (to be codified at 17 C.F.R. §§ 240.11Aa3-1, 240.11Ac1-1, 240.11Ac1-4 & 240.11Ac1-5), https://www.govinfo.gov/content/pkg/FR-1995-10-10/pdf/95-24911.pdf [https://perma.cc/827U-4FE6] [hereinafter Order Execution Obligations Rule Proposals]. For an earlier discussion of the SEC's post-1983 considerations of an order exposure rule, see DIV. OF MKT. REGUL., U.S. SEC. & EXCH. COMM'N, MARKET 2000: AN EXAMINATION OF CURRENT EQUITY MARKET DEVELOPMENTS, at IV-10–13 (Jan. 1994), https://www.sec.gov/divisions/marketreg/market2000.pdf [https://perma.cc/Z36D-PXF3] [hereinafter SEC'S MARKET 2000 STUDY].

[61] Order Execution Obligations Rule Proposals, *supra* note 60, at 52,805 (footnote omitted).

[62] *Id.* at 52,806.

for price improvement must be provided, or what method must be used to provide this opportunity."[63] However, one safe harbor mechanism was offered:

> [P]rior to executing a customer market order in a covered security, the specialist or market maker would be required to stop the customer order at the NBBO, and publish, and maintain for 30 seconds, a bid or offer on behalf of the customer. The specialist or market maker's quote must be for at least the size of the customer order, at a price one minimum variation away from the stop price on the opposite side of the market.[64]

Notably, the market maker in question would have been able to execute an exposed order at its stop price before the expiration of the applicable exposure period if (i) that market maker "receive[d] a subsequent customer market order on the same side of the market during the exposure period," with the subsequent order being exposed, (ii) if "another specialist or market maker execute[d] a transaction at a price equal or inferior to the stop price on the same side of the market," or (iii) "[i]f another specialist or market maker change[d] its bid (in the case of a stopped buy order) or offer (in the case of a stopped sell order) to the stop price" as a measure "to reduce the risk associated with stopping an order during a substantial market move."[65]

Importantly, the regulatory agency pointed to the existence of order exposure features for marketable order flow at several securities exchanges, while emphasizing their focus on specialists, as opposed to a wider exposure, and the rarity of price improvement:

> [M]ost regional exchanges have incorporated order exposure features into their small order routing and execution systems so that price improvement may be offered. Most regional exchanges program their automated execution systems to ensure that customer orders receive a price at the [NBBO] or better, and the

[63] *Id.* at 52,805.

[64] *Id.* (footnote omitted).

[65] *Id.* at 52,806.

specialist is provided an opportunity to improve the price. This feature by itself, however, rarely provides an execution between the spread.[66]

It is also notable that the proposed safe harbor excluded both block and odd-lot orders,[67] but contained no general exclusion for small orders, distinguishing it from the mechanism employed, for instance, by BLMIS. Overarchingly, the SEC expressed its belief that "the rule would complement the long-standing duties of broker-dealers to seek to obtain best execution of their customer orders [and] is intended to foster competition among markets and market makers on the basis of price improvement opportunities."[68] Another stated goal aimed "to enhance customer-to-customer order interaction without the intervention of a specialist or market maker."[69]

Ultimately, the SEC declined to adopt the proposed rule, listing such arguments advanced by various stakeholders as that "an absolute rule would reduce the broker-dealer's fiduciary obligation of best execution to an algorithm, eliminating the exercise of professional judgment in identifying price improvement opportunities," "the proposed safe harbor would dictate the minimum acceptable standard to follow, thereby stifling innovation and competition," and "market price integrity would be reduced due to the proliferation of flickering, ephemeral

---

[66] *Id.* at 52,794 n.11 (internal citation omitted). Earlier, in connection with one of those order exposure features, the SEC had specifically noted that the proposed functionality of automated price improvement for market orders by specialists based on a predetermined formula would *not* lead to such orders being "exposed to the market for possible price betterment." Order Granting Approval to a Proposed Rule Change by Midwest Stock Exchange, Inc. Relating to Orders Received Over the Midwest Automatic Execution System, Exchange Act Release No. 28,014, 55 Fed. Reg. 20,880, 20,883 (May 14, 1990), https://www.govinfo.gov/content/pkg/FR-1990-05-21/pdf/FR-1990-05-21.pdf. However, the regulatory agency was also concerned with balancing the benefits of order exposure features with the possibility that "increased order exposure may impose certain economic costs in terms of execution delay and interjection of manual processing." *Id.*

[67] Order Execution Obligations Rule Proposals, *supra* note 60, at 52,806.

[68] *Id.* at 52,804.

[69] *Id.* at 52,808.

quotations."[70] The opposition—or, at least, skepticism—to this measure was expressed by off-exchange market makers, exchange specialists, and exchanges themselves,[71] which is not surprising in light of the proposed rule's wide coverage. This list even included BLMIS,[72] although that very firm had advertised itself as "proud to have helped set the standards for these new proposals," including the one that "[c]ustomer market orders must have an opportunity for meaningful price improvement."[73] At the same time, the regulatory agency expressed its belief that the companion rules, such as the rule mandating display of customer limit orders, would "greatly improve the price discovery process and the opportunity for customer orders to receive enhanced execution prices."[74] The SEC also stressed that "routing order flow for automated execution, or internally executing order flow on an automated basis, at the best bid or offer quotation, would not necessarily satisfy a broker-dealer's duty of best execution for small orders in listed and OTC securities."[75] Furthermore, while the price improvement proposal was pending, the Cincinnati Stock Exchange ("CSE") adopted a somewhat similar yet truncated mechanism for its Dealer Preferencing Program ("DPP"), a de facto on-exchange internalization facility, to "require that, in greater than minimum variation markets, a preferencing dealer

[70] Order Execution Obligations, Exchange Act Release No. 37,619A, 61 Fed. Reg. 48,290, 48,322 (Sept. 6, 1996) (codified at 17 C.F.R. §§ 240.11Aa3–1, 240.11Ac1-1 & 240.11Ac1–4), https://www.govinfo.gov/content/pkg/FR-1996-09-12/pdf/96-23210.pdf [https://perma.cc/923M-FVWS] [hereinafter Order Execution Obligations Rules]. On the other hand, one of the adopted measures "require[d] OTC market makers and specialists to display the price and full size of customer limit orders when these orders represent buying and selling interest that is at a better price than a specialist's or OTC market maker's public quote," *id.* at 48,290, which constrained the ability of off-exchange market makers to maintain their own captive limit order books not exposed to the marketplace.

[71] *Id.* at 48,322.

[72] *Id.* at 48,322 & nn.336–37, 340, 344, 346.

[73] Bernard L. Madoff Inv. Sec., Advertisement, *Madoff Welcomes the Proposed SEC Rules for Order Execution Obligations. In Fact, We Have Been Applying Them for Years.*, BARRON'S, Oct. 23, 1995, at MW2, MW2.

[74] Order Execution Obligations Rules, *supra* note 70, at 48,322.

[75] *Id.* at 48,323.

immediately execute market orders routed to him or her for execution on the CSE at an improved price or expose the orders on the Exchange for a minimum of thirty seconds to give other market participants an opportunity to provide an improved price."[76]

The SEC revisited the issue of order exposure only a few years later in connection with the remaining restrictions on off-board trading and the broader concerns over fragmentation:

> As a means to enhance the interaction of trading interest, the Commission could require that all market centers expose their market and marketable limit orders in an acceptable way to price competition. . . . As [an] example of acceptable exposure, a market maker, before executing an order as principal in a security whose quoted spread is greater than one minimum variation, could publish for a

[76] Order Granting Approval to a Proposed Rule Change by the Cincinnati Stock Exchange to Adopt Permanently Rules Regarding the Preferencing of Public Agency Orders, Exchange Act Release No. 37,046, 67 Fed. Reg. 15,322, 15,323–24 (Mar. 29, 1996), https://www.govinfo.gov/content/pkg/FR-1996-04-05/pdf/96-8397.pdf [https://perma.cc/B7BU-RTPN]. Approved by the SEC on a pilot basis in 1991, the DPP was specifically designed to make order flow more, but not absolutely, "captive" by "provid[ing] dealers with the ability to retain and execute their internal order flow at the national best bid or offer, provided that [non-dealer] public limit orders at the same price on the CSE book were executed first" and to incentivize market participants to route their retail order flow to the CSE. *Id.* at 15,322. Importantly, when approving the DPP pilot, the SEC required the CSE to ban payment for order flow, although that ban was lifted in 1996. *Id.* at 15,323, 15,329. Accordingly, it appears that certain on-exchange PFOF practices had existed on the CSE by the early 1990's and perhaps even as far back as the late 1970's, and it is possible that these practices had influenced or cross-pollinated off-exchange PFOF practices. An intriguing fact is that BLMIS had maintained a presence on the CSE, which was probably important in light of the remaining off-exchange trading restrictions. *See* Peter Chapman, *Before the Fall*, TRADERS MAG., Mar. 2009, at 30, 36, 40–41 (describing Madoff's interest in joining the CSE and BLMIS's eventual participation, in part guided by regulatory reasons, including the limitations of Rule 19c-3); SEC'S MARKET 2000 STUDY, *supra* note 60, at II-9 (stating that "several third market makers that pay for order flow are designated dealers on the CSE and use it to access ITS for stocks that are not subject to exchanges' off-board trading restrictions"); ERIN ARVEDLUND, TOO GOOD TO BE TRUE: THE RISE AND FALL OF BERNIE MADOFF 192 (rev. ed. 2010) (describing the CSE as "the hub of the Madoffs' payment for order flow"); *see also* Order Approving a Proposed Rule Change by the Cincinnati Stock Exchange, Exchange Act Release No. 14,674, 43 Fed. Reg. 17,894, 17,895 (Apr. 18, 1978), https://www.govinfo.gov/content/pkg/FR-1978-04-26/pdf/FR-1978-04-26.pdf [https://perma.cc/EJ2F-23S5] (approving a multiple dealer trading facility on a pilot basis and noting that "the CSE experiment will provide new opportunities for large retail firms, by making markets through the CSE facility, to deal directly with their customers on a principal basis").

> specified length of time a bid or offer that is one minimum variation better than the NBBO.[77]

As potential alternatives, the SEC considered, among other things, "reducing the extent to which market makers trade against customer order flow by matching other market center prices" and "adopt[ing] an intermarket prohibition against market makers (including exchange specialists) using their access to directed order flow to trade ahead of investor limit orders that were previously displayed by any market center and accessible through automatic execution by other market centers."[78] Additionally, in its discussion of price competition and order interaction, the regulatory agency emphasized the nature of the statutory mandate:

> Section 11A(a)(1)(C)(v) of the Exchange Act [the Securities Exchange Act of 1934] provides that the national market system should assure an opportunity for investors' orders to be executed without the participation of a dealer. This objective is explicitly conditioned on its being consistent with the national market system objectives of efficiency and best execution of investor orders. It is not conditioned on consistency with the objective of fair competition among different types of market centers. Thus, dealer participation in securities transactions is warranted only to the extent that it leads to more efficient execution of securities transactions or the best execution of investor orders.[79]

---

[77] Notice of Filing of a Proposed Rule Change by the New York Stock Exchange, Inc. to Rescind Exchange Rule 390; Commission Request for Comment on Issues Relating to Market Fragmentation, Exchange Act Release No. 42,450, 65 Fed. Reg. 10,577, 10,586–87 (Feb. 23, 2000), https://www.govinfo.gov/content/pkg/FR-2000-02-28/pdf/00-4595.pdf [https://perma.cc/SZ38-YZSY]. One of the factors behind this initiative was the NYSE's request to the SEC to "adopt a market-wide requirement . . . that broker-dealers not be permitted to trade against their customer orders unless they provide a price to the order that is better than the national best bid or offer against which the order might otherwise be executed." *Id.* at 10,578. In this context, the NYSE also expressed the following concern about the business model of off-exchange market making: "The Exchange believes that broker-dealer internalization results in the most objectionable of all forms of market fragmentation: the execution of 'captive' customers' orders in such a manner as to insulate them from meaningful interaction with other buying and selling interest. This not only decreases competitive interaction among markets and market makers, but also isolates segments of the total public order flow and impedes competition among orders, with no price benefit to the orders being internalized." *Id.* at 10,579.

[78] *Id.* at 10,586–87.

[79] *Id.* at 10,581 n.28.

The issue of an order exposure rule had attracted attention of various stakeholders,[80] and one of the most detailed responses came from Primex Trading, a trading platform linked to BLMIS.[81] The comment letter maintained that "exposure of market orders . . . can provide a

[80] For the SEC's discussion of the feedback on this issue, including considerations of competitive aspects and potential regulatory distinctions between off-exchange market makers and exchange specialists, see Order Approving a Proposed Rule Change by New York Stock Exchange, Inc. to Rescind Rule 390, Exchange Act Release No. 42,758, 65 Fed. Reg. 30,175, 30,177 (May 5, 2000), https://www.govinfo.gov/content/pkg/FR-2000-05-10/pdf/00-11682.pdf [https://perma.cc/R49W-4A6J] [hereinafter Order Approving NYSE's Proposal to Rescind Rule 390].

[81] Glen Shipway, Chief Exec. Officer & Peter B. Madoff, Manager, Primex Trading N.A., LLC, Comment Letter to the SEC on Issues Relating to Market Fragmentation (May 12, 2000), https://www.sec.gov/rules/sro/ny9948/shipway1.htm [https://perma.cc/84XZ-KFCV] [hereinafter Primex's Comment Letter on Market Fragmentation]. *See also Another Stab at the Third Market: Madoff's Brave New Trading World*, TRADERS MAG. (Aug. 31, 1999), https://www.tradersmagazine.com/news/another-stab-atthe-third-market-madoffs-brave-new-trading-world/ [https://perma.cc/Y2UX-9QZW] (discussing BLMIS's early design for Primex as a price improvement auction for market and marketable limit orders, including the proposed use of the maker-taker pricing model, and the impact of such factors as decimalization); Auction Market with Price Improvement Mechanism, U.S. Patent Publication No. US 2001/0044767 A1 (filed Mar. 19, 1999) (published Nov. 22, 2001), https://patentimages.storage.googleapis.com/9f/aa/5c/49729216f5e948/US20010044767A1.pdf [https://perma.cc/Y42J-YEQQ] (asserting the novelty of Primex's business model); Order Granting Approval of a Proposed Rule Change by National Association of Securities Dealers, Inc. Relating to Permanent Approval of the Primex Auction System, Exchange Act Release No. 47,351, 68 Fed. Reg. 8055 (Feb. 11, 2003), https://www.govinfo.gov/content/pkg/FR-2003-02-19/pdf/03-3945.pdf [https://perma.cc/9MYB-L2BH] (describing Primex as a voluntary trading facility of Nasdaq designed to offer price improvement auctions for market and marketable limit orders within the NBBO); *Madoff's Guide to Best Execution – Listed Securities*, BERNARD L. MADOFF INV. SEC. (Feb. 7, 2003), https://web.archive.org/web/20030207120654/http://www.madoff.com/dis/display.asp?id=352&mode=1&home=1 (stating that "Madoff will expose 'eligible' orders we receive from our customers in the Primex Auction System," clarifying that "[e]ligible orders include immediately marketable orders greater than 99 shares that are received during normal trading hours in securities," and maintaining that, "[i]f the Primex auction does not immediately achieve a better price or provide enhanced liquidity, Madoff will execute the orders based on our traditional algorithmic approach"); Ivy Schmerken, *Nasdaq Unwinds Exclusive with Primex Auction System*, WALL ST. & TECH. (Jan. 8, 2004), https://www.wallstreetandtech.com/trading-technology/nasdaq-unwinds-exclusive-with-primex-auction-system/d/d-id/1256311.html [https://perma.cc/52ZV-3W77] (describing the discontinuation of Primex as NASDAQ's trading facility).

greater degree of order confluence, particularly in a multi-dealer market, by making a larger pool of trading interest available to a broader range of participants [and] enhanced abilities for broker-dealer fiduciaries to obtain price improvement for their customers."[82] On the other hand, such change was advocated to "be in a form that encourages exposure of market orders to the greatest extent possible, but should not be strictly mandatory."[83] Primex also criticized the contemplated order exposure mechanism:

> Merely exposing a market order as a priced order one minimum variation better than the NBBO . . . may not serve to maximize the benefits of exposure for the order, particularly in a decimal environment [as] any price chosen for purposes of displaying an unpriced market order in the quote is almost completely arbitrary, and may not maximize price improvement opportunities for the order.[84]

Not unexpectedly, Primex presented its own business model as a potential solution:

> [O]ne way to accomplish this is to employ new technology to emulate and expand upon the traditional floor trading model of exposing orders to a trading crowd for price competition. Primex Trading is finalizing development of such a system that facilitates the interaction of buyers and sellers through an electronic auction process. The system is predicated primarily on providing price improvement opportunities for market orders. These orders are announced to an electronic "crowd" who "bid" for them within the context of the NBBO in a fair, orderly, and highly automated manner using a variety of new and sophisticated tools designed for this purpose.[85]

Ultimately, the SEC did not embark on refining the contemplated order exposure rule in connection with the abolition of the remaining restrictions on off-board trading, but it still expressed its concerns about "certain broker-dealer practices that may substantially reduce the opportunity for investor orders to interact"[86] and presented the following frame of analysis that took a critical approach to the business model of off-exchange market making:

---

[82] Primex's Comment Letter on Market Fragmentation, *supra* note 81.

[83] *Id.*

[84] *Id.*

[85] *Id.*

[86] Order Approving NYSE's Proposal to Rescind Rule 390, *supra* note 80, at 30,179.

> Internalization and payment for order flow arrangements provide dealers with a guaranteed source of order flow, eliminating the need to compete aggressively for orders on the basis of their displayed quotation. Instead, the dealers can merely match the prices that are publicly displayed by other market centers. These prices in many cases will represent limit orders that are displayed by agency market centers (such as the NYSE or an ECN [electronic communication network]). The limit orders may be denied an opportunity for an execution if dealers choose not be route orders to the market center displaying the limit orders and instead match the limit order prices. . . . Moreover, if a substantial portion of the total order flow in a security is subject to dealer price-matching arrangements, it reduces the ability of other dealers to compete successfully for order flow on the basis of their displayed quotations. In both cases (unfilled limit orders and disregarded dealer quotations), those market participants who are willing to participate in public price discovery by displaying firm trading interest at the best prices are not rewarded for their efforts. This creates disincentives for vigorous price competition, which, in turn, could lead to wider bid-asked spreads, less depth, and higher transaction costs. These adverse effects would harm all orders, not just the ones that are subject to internalization and payment for order flow arrangements. . . . Moreover, an agent-principal monitoring problem may tend to perpetuate rather than alleviate the isolation of investor orders that are subject to internalization and payment for order flow arrangements. It can be very difficult for retail customers to monitor the quality of execution provided by their brokers, particularly in fast-moving markets. Given the difficulty of monitoring execution quality, the most rational strategy for any individual customer may be simply to opt for the lowest commission possible (which may be low in part because the broker is receiving payment for order flow, part of which is passed on the customer). If many individual customers adopt this strategy, it could blunt the forces that otherwise would reward market centers that offer high quality executions.[87]

Not having pursued any concrete steps for another ten years, the SEC floated the idea of "a 'trade-at' rule that would prohibit any trading center from executing a trade at the price of the NBBO unless the trading center was displaying that price at the time it received the incoming contra-side order" in the context of the hypothetical that "the quality of public price discovery [may have] been harmed by undisplayed liquidity."[88] In terms of potential implementation, the SEC advanced the following approach: "[A] trading center that was not displaying the NBBO at

[87] *Id.* (footnotes omitted).

[88] Concept Release on Equity Market Structure, Exchange Act Release No. 61,358, 75 Fed. Reg. 3594, 3613 (Jan. 14, 2010), https://www.govinfo.gov/content/pkg/FR-2010-01-21/pdf/2010-1045.pdf [https://perma.cc/32K5-6W9Q] [hereinafter Concept Release on Equity Market Structure].

the time it received an incoming marketable order could either: (1) Execute the order with significant price improvement (such as the minimum allowable quoting increment . . .); or (2) route ISOs [intermarket sweep orders] to full displayed size of NBBO quotations and then execute the balance of the order at the NBBO price."[89] This approach may be seen as a proxy for order-by-order competition because it prioritizes displayed liquidity, while allowing an exception for one tick size price improvement similar to the earlier versions of an order exposure rule proposed by the SEC, but some forms of such competition in fact take place via dark liquidity, such as interaction of hidden orders on a multilateral trading venue. Not surprisingly, numerous stakeholders were critical of the trade-at rule approach,[90] which ultimately had not gained much traction with the regulators.

---

[89] *Id.*

[90] *See, e.g.,* Dan Mathisson, Managing Dir., Credit Suisse Sec. (USA) LLC, Comment Letter to the SEC on Equity Market Structure 4–6 (Apr. 21, 2010), https://www.sec.gov/comments/s7-02-10/s70210-140.pdf [https://perma.cc/NHA3-RU9X] ("A trade-at rule would damage competition among exchanges and ATSs [alternative trading systems], and therefore drive exchange fees higher. It might also lead to some unintended consequences, including an increase in retail commissions, a decrease in the average print size, and more flickering quotes. . . . If a trade-at rule was implemented, retail brokers would be required to route marketable orders to displayed markets. Routing orders to displayed markets would prevent the current standard practice of market makers providing guaranteed price improvement and enhanced liquidity to retail investors, and would therefore result in worse pricing for the retail orders. It would force retail brokers to incur access costs which would almost certainly be transferred to their customers in the form of higher commissions."); Greg Tusar, Managing Dir., Goldman Sachs Execution & Clearing, L.P. & Matthew Lavicka, Managing Dir., Goldman Sachs & Co., Comment Letter to the SEC on Equity Market Structure 3 (June 25, 2010), https://www.sec.gov/comments/s7-02-10/s70210-243.pdf [https://perma.cc/6LNQ-K6J6] ("We do not support adoption of a trade-at rule, which we view as incorrectly focusing on price as the only determinant of best execution. A trade-at rule also likely would increase execution costs because of increased information leakage about trading interest, missed opportunities to access liquidity, additional latencies and increased access fees."); Leonard J. Amoruso, Gen. Couns., Knight Capital Grp., Inc., Comment Letter to the SEC on Equity Market Structure 5 (Apr. 25, 2010), https://www.sec.gov/comments/s7-02-10/s70210-156.pdf [https://perma.cc/Q2VA-HQ24] ("Trade-At would add significant costs to retail and institutional orders: implicitly by minimizing competition and competitive innovation, explicitly by forcing many users of lower cost alternative venues to pay access fees. It would minimize the opportunities for price improvement

The historical trajectory of the SEC's concerns and views on potential regulatory reforms to enhance order-by-order competition incorporates several themes, which, however, should be viewed in the context of the regulatory agency's perspective on the desirability of competition between exchange and non-exchange trading venues. Overarchingly, the regulators expressed their concerns over the themes of more efficient interaction of orders, improved market quality, and restraints on unnecessary intermediation, while realizing that the very concept of best execution could potentially be molded in a systematic way, and not just on a firm-by-firm basis, by the very features of the underlying regulatory regime. Moreover, the focus of the regulators had largely shifted to off-exchange trading of market and marketable limit orders of retail investors, although some contemplated measures, such as the trade-at rule, would have had a major impact on dark liquidity involving institutional investors and alternative trading systems as

---

(and eliminate sub-penny price improvement) to retail orders as they would always trade at the NBBO. It would reduce liquidity provided by market makers as increased costs would outweigh their liquidity provision ability in most cases. It would vastly increase quote message traffic and quote flickering as firms would be forced to be at the NBBO (likely at the lowest permissible quantity) to service their customers. It would significantly diminish the ability of investors, including long-term investors, to use non-displayed trading venues (which typically do not place orders into the displayed markets) to handle their sensitive order flow."); Janet M. Kissane, Senior Vice President – Legal & Corp. Sec'y, Office of the Gen. Couns., NYSE Euronext, Comment Letter to the SEC on Equity Market Structure 11 (Apr. 23, 2010), https://www.sec.gov/comments/s7-02-10/s70210-154.pdf [https://perma.cc/JAB4-EV46] ("As a means for encouraging displayed liquidity, adoption of a full trade-at rule would be a very strong step. Accordingly, we believe the Commission should consider whether there are lesser means to achieve the same objectives. As an alternative, the Commission could consider adopting specific requirements on broker-dealers who internalize orders."); *see also* George U. Sauter, Managing Dir. & Chief Inv. Officer, The Vanguard Grp., Inc., Comment Letter to the SEC on Equity Market Structure 5 (Apr. 21, 2010), https://www.sec.gov/comments/s7-02-10/s70210-122.pdf ("Vanguard believes the Commission should consider the costs and benefits of a 'trade-at' rule . . . Such a rule would clearly provide an incentive to display limit orders which . . . is in the best interests of all investors [but] there may be costs and unintended consequences . . . . Vanguard believes large block crossing networks that match large institutional clients at prices between the NBBO play a valuable role in today's markets. By requesting that a 'trade-at' rule be considered, Vanguard is not advocating for the elimination of all forms of dark liquidity.").

multilateral trading venues often employed by such investors. This shift is not surprising, given the fundamental change in retail trading since the 1970s,[91] leading up to the current market structure with its lack of a widely adopted parallel trading platform in the exchange space for segmented retail orders. On the other hand, the business model of off-exchange market making based on some combination of such key elements as customized order flow arrangements between broker-dealers, aggregation and segmentation of order flow typically focused on retail orders, PFOF instead of fees, automated execution, provision of dark liquidity based on matching the prevailing marketwide price with potential price improvement, and order size guarantees had been firmly established by the early 1990's.[92] In fact, the regulators' concerns falling under the

[91] *Compare* Off-Board Trading and Rule 19c-1 Adoption, *supra* note 35, at 4509 ("[W]hile institutions may direct orders to over-the-counter market makers or to an exchange market for execution, relatively modest orders of smaller customers are confined to exchange markets because of restrictions placed upon members of the 'primary' exchanges (who represent the great majority of noninstitutional customers)."), *with* Concept Release on Equity Market Structure, *supra* note 88, at 3600 ("OTC market makers . . . appear to handle a very large percentage of marketable (immediately executable) order flow of individual investors that is routed by retail brokerage firms. A review of the order routing disclosures required by Rule 606 of Regulation NMS of eight broker-dealers with significant retail customer accounts reveals that nearly 100% of their customer market orders are routed to OTC market makers."), *and* Order Competition Rule Proposal, *supra* note 2, at 178 ("At present, the vast majority of retail orders (over 90% of marketable NMS stock orders) are routed to wholesalers, where they are frequently executed in isolation, on a captive basis.").

[92] PAYMENT FOR ORDER FLOW COMM., NAT'L ASS'N OF SEC. DEALERS, INC., INDUCEMENTS FOR ORDER FLOW: A REPORT TO THE NASD BOARD OF GOVERNORS 14–15, 25–26, App. C, at 41–42 (July 1991) [hereinafter NASD, INDUCEMENTS FOR ORDER FLOW REPORT]. Ironically, it was Madoff himself who had claimed the development of retail-oriented off-exchange market making as his crowning achievement: "If you want to give me credit for anything[,] it was for having the vision of electronic trading as a way of lowering the cost of executing orders for our client discount firms, like Fidelity and Schwab. The smartest thing I did was to realize that as a market maker the best order flow to trade against was small retail order flow that would not have an immediate market impact and allowed you to get out of the stock you just bought to minimize inventory risk from price declines. The problem with that small order flow was that it was cumbersome to handle the large volume of retail trades. The answer was technology. Equally as important was to develop the algorithmic technology to allow you to both mitigate risk and keep up to date on your exposure with real-time trading P&Ls [profit and loss positions]. We were the first firm to

umbrella of order-by-order competition have had a clear connection to this model, including the captive nature of order flow arrangements, conflicts of interest presented by PFOF practices, and the commission structure. At the same time, certain similar—although now essentially historical—issues relevant for securities exchanges were also scrutinized, as illustrated by the SEC's concern that certain regional exchanges had de facto captive order flow arrangements and offered order exposure features that were inadequate, accompanied by its exploration of a regulatory fix for both on- and off-exchange market makers.[93]

---

build all this." JIM CAMPBELL, MADOFF TALKS: UNCOVERING THE UNTOLD STORY BEHIND THE MOST NOTORIOUS PONZI SCHEME IN HISTORY 32 (2021). In fact, as far back as 1989, Madoff explicitly stated before the regulators that not all types of order flow have been created equal, comparing a more valuable order flow from "a Charles Schwab" to a less valuable, if not undesirable to BLMIS, order flow "from a competing specialist on an exchange or from a block firm." U.S. Sec. & Exch. Comm'n, Roundtable on Commission Dollar and Payment for Order Flow Practices 132–33 (July 24, 1989), http://3197d6d14b5f19f2f440-5e13d29c4c016cf96cbbfd197c579b45.r81.cf1.rackcdn.com/collection/papers/1980/1989_0724_CommisionDollar_1of4.pdf [https://perma.cc/G392-C643], http://3197d6d14b5f19f2f440-5e13d29c4c016cf96cbbfd197c579b45.r81.cf1.rackcdn.com/collection/papers/1980/1989_0724_CommisionDollar_4of4.pdf [https://perma.cc/SYJ7-29M6] [hereinafter SEC Roundtable on Commission Dollar and PFOF Practices].

[93] Order Execution Obligations Rule Proposals, *supra* note 60, 52,794 n.11, 52,805; Order Exposure Rules Proposal, *supra* note 39, at 22,380–82. Notably, regional exchanges had employed a business model that had some overlaps with the one used in the off-exchange space, given such features as the focus on automated execution of small orders tied to a market benchmark, the existence of price guarantees, and more favorable fees: "During the 1970s and 1980s, the regional exchanges built automated systems that enabled member firms to route small customer orders to their specialist posts. Orders routed over these systems generally are executed automatically at the ITS best bid or offer, regardless of the quote of the particular regional specialist. Because of the speed and efficiency of these systems, lower transaction fees, and the guarantee of the ITS best bid or offer, many retail broker-dealers send some of their small order flow to the regional exchanges. . . . In recent years, the regional exchanges have solidified further their share of small order business by facilitating the affiliation of their specialist[] firms with substantial retail order flow." SEC'S MARKET 2000 STUDY, *supra* note 60, at II-9. Moreover, in the early 1980's, certain regional exchanges appeared to be ahead of off-exchange market makers in terms of possessing automated order routing capabilities and automated execution of small orders, as suggested by the SEC's discussion of the adoption of Rule 19c-3. Off-Board Trading Restrictions and Rule 19c-3 Adoption, *supra* note 29, at 41,126 n.19, 41,127 & n.25, 41,128 n.36, 41,129 & n.45.

On the other hand, off-exchange market makers did not appear to be interested in a regulatory disruption of order flow relationships and their captive nature, for instance, through some version of an order exposure rule, which was logical from the standpoint of the underlying business model. Even BLMIS opposed a mandatory order exposure rule, despite having used its own order exposure mechanism as a marketing tool. In fact, in its comment letter to the SEC, BLMIS stated that the proposed "safe harbor may . . . not be appropriate for small orders (100-500 shares),"[94] which would have excluded the bulk of bread-and-butter retail orders this firm and its competitors, after all, were paying retail brokers for. Another persistent challenge faced by the regulators and the industry relates to the specifics of implementing order-by-order competition, such as the calibration of the process of price discovery, the workability of the applicable order exposure mechanism, and the determination of the magnitude of price improvement. While such mandatory measures as abolishing or severely restricting off-exchange trading or converting market orders and exposing them with one tick size price improvement have failed to gain steam, other measures, such as price improvement auctions, have been used on a voluntary basis and likewise failed to be widely adopted, plausibly as counter to the key stakeholders' vested interests.

II. The Current Market Structure and Models of Competition

Defining the essence of order-by-order competition as exposure of each order for potential interaction with various market participants does not preclude the existence of price competition under the business model of off-exchange market making in the current market

[94] Bernard L. Madoff & Peter B. Madoff, Bernard L. Madoff Inv. Sec., Comment Letter to the SEC on the Order Execution Obligations Rule Proposals 17 (Jan. 12, 1996) (on file with author) [hereinafter BLMIS's Comment Letter on the Order Execution Obligations Rule Proposals].

structure, aside from any other additional services offered by wholesalers. One important trackable metric is price improvement *over* the NBBO provided by wholesalers in the aggregate or for specific categories of orders or customers. An executive of a leading wholesaler maintained that such market participants "compete against each other and over 40 other liquidity sources (exchanges, ATSs [alternative trading systems]) for the opportunity to provide execution and routing of orders for retail brokers" and presented evidence that average price improvement provided by wholesalers had increased by 750% on a per share basis from 2013 to 2020.[95] As argued further, because "[r]etail brokers measure liquidity sources based on the amount of price improvement provided . . . [t]his structure puts wholesalers in competition to provide the best execution for the retail broker on all orders handled."[96] The same commentator maintained that, given the practice of some customer-facing brokerage firms of relying on multiple wholesalers, "Robinhood [a leading retail brokerage firm] will make routing changes intramonth all the time based on how we're performing."[97] As described by an executive of Robinhood itself, "[O]ur

---

[95] Douglas Cifu, Chief Exec. Officer, Virtu Fin., Inc., Measuring Real Execution Quality: Benefits to Retail Are Significantly Understated 5, 7 (June 10, 2021), https://www.sec.gov/comments/265-28/26528-8901054-242178.pdf [https://perma.cc/WG5F-UK8G]. *But see* Alexander Gerko, *Separating Fiction from Facts Separated from Fiction*, LINKEDIN (June 11, 2021), https://www.linkedin.com/pulse/separating-fiction-from-facts-separated-alexander-gerko/ [https://perma.cc/LD3M-MQTT] ("Both the size of [price improvement] and [the relevant bid-ask] spreads are driven by [two] factors: 1) because both are measured in cents per share, and stock splits are not as common now, average share price in 2020 is much higher than in 2013 [and] 2) Dramatic change in the composition of stocks that retail participants are trading (towards stocks with wider spreads), driven by perverse incentives throughout the system.").

[96] Cifu, *supra* note 95, at 7.

[97] *Market Structure Conference 3.0 – Doug Cifu, CEO of Virtu Keynote Discussion*, BLOOMBERG, at 16:39–:46 (May 24, 2022), https://www.bloomberg.com/news/videos/2022-05-24/market-structure-conference-3-0-virtu-ceo-keynote-video (remarks of Douglas Cifu, Chief Executive Officer, Virtu Financial, Inc.) [hereinafter *Market Structure Conference 3.0 – Doug Cifu*]. For an illustration of Robinhood's practice of allocating equity orders across several off-exchange market makers, as opposed to other types of trading venues, and resulting month-to-month changes within one calendar quarter, see Robinhood Sec., LLC, Held NMS Stocks and Options Order Routing

order router looks across these six or seven market makers that we have relationships with; it determines who has done the best on that size order in that issuer over the last thirty days, and it sends the order there."[98] Yet another leading retail brokerage firm described the competitive forces in the following manner:

> [T]he competitive environment [for retail order flow is] fostered by the current market structure, where wholesalers must compete on the basis of execution quality to win more flow. For this competition between wholesalers to stay dynamic, Schwab has invested in its own order routing capabilities to ensure that seamless routing changes from one wholesaler to another can be made based on execution performance. We also invest in both in-house and third-party analytics to rigorously and impartially evaluate these wholesalers so we can route order flow in a way that optimizes our clients' trading experience.[99]

This area has also been subjected to formal data analysis. For instance, one empirical study described "the evidence . . . consistent with wholesalers competing by offering lower liquidity costs across all stocks as opposed to on a security-by-security basis, and retail brokerages playing pivotal roles in ensuring the best-performing wholesalers are awarded more order flow."[100] Another empirical study made a similar conclusion that "broker routing is intensely competitive, brokers allocate order flow to wholesalers based on their past

---

Public Report, 2d Q., 2022 (July 28, 2022), https://cdn.robinhood.com/assets/robinhood/legal/RHS%20SEC%20Rule%20606%20and%20607%20Disclosure%20Q2%202021.pdf [https://perma.cc/25MD-GRJX].

[98] Paul Hastings, *SEC Roundup – Episode 27: Robinhood CLO Dan Gallagher on Regulatory Response to Meme Stocks*, YOUTUBE, at 6:53–7:08 (July 20, 2022), https://www.youtube.com/watch?v=Rs7l7Au5DBk.

[99] THE CHARLES SCHWAB CORP., U.S. EQUITY MARKET STRUCTURE: ORDER ROUTING PRACTICES, CONSIDERATIONS, AND OPPORTUNITIES 13–14 (2022), https://content.schwab.com/web/retail/public/about-schwab/Schwab-2022-order-routing-whitepaper.pdf [https://perma.cc/2WX9-LQVZ].

[100] Anne Haubo Dyhrberg et al., The Retail Execution Quality Landscape 20 (rev. Oct. 29, 2023) (unpublished manuscript) (on file with author), https://www.dropbox.com/s/ojz0j27d4kgq25x/sample2.pdf [https://perma.cc/PGX5-GY2A].

performance, and wholesalers are aware of it and offer price improvements accordingly."[101] In part, the study articulated the following finding: "For every one percentage point increase in EFQ [the effective-to-quoted spread ratio], we find that wholesalers obtain between 0.8 and 1.2% less order flow allocation. If we consider the ordinal ranking of wholesalers, a worse ordinal ranking leads to 6 to 10% less order flow allocation."[102] The study also described various evaluation methodologies employed by different brokerage firms, including such factors as the applicable time horizon, bundle- or symbol-by-symbol-based performance, and size categories.[103] The study also pointed to the multidimensional nature of price improvement: "Prioritizing one dimension of improvement leads to price improvement in that dimension, but that priority must come at the expense of a reduced priority along other dimensions, and potential price dis-improvement."[104] As an illustration of this principle, the study suggested the existence of the tradeoff between price improvement for odd-lot and larger sized orders for one of the brokerage firms in the sample as a result of a change in its execution priorities.[105] However, another empirical study documented two different methods used by brokerage firms to allocate

---

[101] Thomas Ernst et al., What Does Best Execution Look Like? 35 (Nov. 29, 2023) (unpublished manuscript) (on file with author) [hereinafter Ernst et al., What Does Best Execution Look Like?], *reproduced in* Chester Spatt, Pamela R. and Kenneth B. Dunn Professor of Fin., Tepper Sch., Carnegie Mellon Univ., et al., Comment Letter to the SEC on the Market Structure Rule Proposals (Nov. 29, 2023), https://www.sec.gov/comments/s7-32-22/s73222-304679-783822.pdf. Importantly, the study could not identify systematic failures of order routing allocation practices: "We do not find Pareto shortcomings in the current system, but rather that brokers have developed policies to enforce wholesaler competition. Price improvement offered by wholesalers is conditional on these policies, and any changes to broker's routing criteria change the conditional price improvement obtained." *Id.* at 6

[102] *Id.* at 3. *See also id.* at 9 ("The reward to the best wholesaler . . . must strike a balance between rewarding past performance while also maintaining the ability to increase the reward (order allocation) should the wholesaler offer even greater price improvement.").

[103] *Id.* at 8–9.

[104] *Id.* at 24.

[105] *Id.* at 23–25.

order flow to multiple wholesalers: "The first is proportional, where stocks are sent in the same proportions but in potentially different total amounts. The second is selective, where stocks are routed individually to different wholesalers."[106] Moreover, this study found that "a majority of our brokers [in the sample] do not seem to change their routing based on past execution [and] only one does so at a statistically significant level."[107] Even more so, the study indicated that "the majority of brokers actually route more orders to wholesalers associated with higher execution costs."[108] Ultimately, the study suggested that "[e]ither brokers are poor monitors of price execution by wholesalers, with ineffective follow-up, or the wholesaler market is not competitive and therefore brokers do not feel capable of changing their routing practices."[109] In addition, the regulators had identified instances when "[certain] firms . . . did not disclose that they represented to their routing or executing brokers that they would provide exclusively retail order flow to the routing broker in order to receive PFOF under arrangements with their routing brokers,"[110] which by definition precludes the type of wholesaler competition described above.

Overarchingly, the competitive forces inherent in the current market structure may have their imperfections. One major concern is the level of concentration in the wholesaling segment, which has been flagged by the SEC's leadership.[111] In fact, one empirical study concluded that

---

[106] Xing Huang et al., Who Is Minding the Store? Order Routing and Competition in Retail Trade Execution 47 (Nov. 9, 2023) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=4609895.

[107] *Id.* at 3.

[108] *Id.* at 4.

[109] *Id.* at 30.

[110] DIV. OF EXAMINATIONS, U.S. SEC. & EXCH. COMM'N, RISK ALERT, OBSERVATIONS RELATED TO REGULATION NMS RULE 606 DISCLOSURES 5–6 (Nov. 10, 2022), https://www.sec.gov/files/reg-nms-rule-606-disclosures-risk-alert.pdf [https://perma.cc/9MTG-TSP2] [hereinafter SEC'S RISK ALERT ON RULE 606 DISCLOSURES].

[111] *See, e.g.*, Gensler, Prepared Remarks at the Global Exchange and FinTech Conference, *supra* note 3 ("Within the off-exchange market maker space, we are seeing concentration. One firm has publicly stated that it executes nearly half of all retail volume.").

"reduced segmentation of retail flow (via a reduction in internalized trading volume, where competition for order flow appears to be much weaker) would lead to especially large market quality improvements for stocks with highly concentrated internalizer markets."[112] On the other hand, another empirical study questioned the existence of market power in this context, with the entry of a major competitor as a case study:

> If wholesalers were exploiting their market power and enjoying economic rents before this entry, we would expect competitive pressures to intensify, leading to lower liquidity costs. The data, however, do not support this conjecture; we find no evidence of a decrease in liquidity costs. In fact, in low-volume stocks, the costs increase, likely due to the incumbents' loss of economies of scale.[113]

By contrast, an empirical study of the impact of the same event on *one* brokerage firm made a different conclusion: "Immediately after this entry, we find a significant improvement in the overall price execution by the other wholesalers at that broker; in addition, they still lost significant market share. This suggests that retail investors at that broker benefited from this increased wholesaler competition."[114]

The level of concentration has also been tied to other structural factors: "Given the amount of private information they have [about order flow] and the role they play in public exchanges [as designated market makers], the concentration of the large wholesalers is

[112] Edwin Hu & Dermot Murphy, Competition for Retail Order Flow and Market Quality 7 (rev. Aug. 31, 2023) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=4070056.

[113] Dyhrberg et al., *supra* note 100, at 3. Similarly, the same study found that the top two wholesalers "charge the lowest liquidity costs, even though they handle the most informed retail flow [and] the scale of their operations explains the relatively low liquidity costs charged by the top two wholesalers." *Id.* at 2.

[114] Huang et al., *supra* note 106, at 4. Moreover, yet another empirical study analyzing the entry of an unnamed wholesaler, which is likely to be the same event, found "some evidence consistent with an increase in competition," such as decreased effective-to-quoted spread ratios for "both the incumbent wholesalers and the wholesalers including wholesaler A5." Ernst et al., What Does Best Execution Look Like?, *supra* note 101, at 4.

concerning."[115] More specifically, the implication is that the existing level of concentration in combination with the informational edge provided by order flow arrangements and other channels, such as wholesalers' institutional business, could inhibit competition in providing liquidity and increase marketwide transaction costs.[116] Furthermore, it has been asserted that competing on average execution quality is inferior to order-by-order competition:

> While some market makers may have more capital and are able to offer better spreads on average, this is not true all the time for all stocks. Market makers are incentivized to quote a better bid than offer if they are short a stock, and a better offer than bid if they are long a stock, creating an opportunity for smaller market makers to step in front of large market makers when their inventories are skewed against incoming order flow.[117]

As a counterargument, another commentator maintained that order-by-order competition "paradoxically could lead to substantially worse price improvement for retail users [because] competing in a blind Dutch auction, you have to consider the toxicity of both your counterparties *and* your competitors," triggering the "winner's curse" scenario.[118] According to that theory, "[f]or retail order flow, per-order is almost certainly sub-optimal to bulk competition . . . because

---

[115] HITESH MITTAL, FOUNDER & CHIEF EXEC. OFFICER, AND KATHRYN BERKOW, SENIOR RESEARCHER, BESTEX RESCH. GRP. LLC, THE GOOD, THE BAD & THE UGLY OF PAYMENT FOR ORDER FLOW 15 (May 3, 2021), https://f.hubspotusercontent10.net/hubfs/4982966/BestEx%20Research%20PFOF%2020210503.pdf [https://perma.cc/56J7-9N7Y].

[116] *Id.* at 14–17. For an additional discussion of informational advantages in the context of the business model of off-exchange market making, see Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations*, *supra* note 15, at 528. *See also* Gerko, *supra* note 95 ("Informational advantage applies to aggregate characteristics of the flow rather than an individual order. A wholesale market maker is highly unlikely to 'front run' a client order in any sense, that would be very illegal. On the other hand[,] retail flow in aggregate is highly predictable and certainly can be used to inform a trading strategy and allow to position yourself for expected incoming flow. There is a big information advantage that comes with running a wholesale retail operation at scale.").

[117] MITTAL & BERKOW, *supra* note 115, at 16.

[118] @0xdoug [Doug Colkitt], X [TWITTER] (June 8, 2022, 5:34 PM CST), https://twitter.com/0xdoug/status/1534665158773047300.

there's far less asymmetric information at the bulk level."[119] An academic study skeptical of retail auctions also formalized the logic based on the "winner's curse" approach.[120]

Another concern relates to the possibility of a tradeoff between price improvement and PFOF, which may create conflicts of interest and impede competition based on price.[121] This very tradeoff was one of the key elements of the SEC's enforcement action against Robinhood,[122] which demonstrates its practical relevance, a flashpoint during the questioning of Kenneth C. Griffin, the Chief Executive Officer of Citadel LLC, by U.S. Representative Brad Sherman at a recent congressional hearing,[123] and an important issue in the financial media's coverage.[124] Moreover, targeting this tradeoff in its recent guidance, FINRA stated that

---

[119] *Id.*

[120] Thomas Ernst et al., Would Order-by-Order Auctions Be Competitive? (rev. Mar. 8, 2023) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=4300505 [hereinafter Ernst et al., Would Order-by-Order Auctions Be Competitive?]

[121] While this tradeoff is, in some sense, a truism, another perspective is on the applicable commission structure as a cost borne by investors. In practice, the issues of commissions, PFOF, and price improvement are interrelated. A traditional defense of PFOF, as articulated by Madoff back in 1993, is that "it lowers the bottom line of the brokers [and] produces lower-cost commissions," while pointing out that "most of our customers are low-cost providers of execution." *National Market System: Hearings Before the Subcomm. on Telecomms. & Fin. of the H. Comm. on Energy & Com.*, 103d Cong. 412 (1994), https://books.google.com/books?id=_c41YXU5JjIC [hereinafter *National Market System House Hearings*] (remarks of Bernard L. Madoff, Chairman, Bernard L. Madoff Investment Securities). The emergence of the zero-commission model embraced by many retail brokerage firms makes any comparison easier by taking the commissions differential out of the equation and yet leaving in other services for investors potentially funded by PFOF. For the author's discussion of the zero-commission model, see Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations*, *supra* note 15, at 497–99, 530.

[122] Robinhood Fin., LLC, Securities Act Release No. 10,906, Exchange Act Release No. 60,694, at 2–7 (Dec. 17, 2020) (settled proceeding), https://www.sec.gov/litigation/admin/2020/33-10906.pdf [https://perma.cc/3K7M-YDXQ].

[123] *Game Stopped House Hearings, Part I*, *supra* note 5, at 23–24.

[124] *See, e.g.*, @SquawkCNBC [Squawk Box], X [TWITTER], at 2:16–:23 (Mar. 11, 2021, 6:55 AM CST), https://twitter.com/SquawkCNBC/status/1369995291148050432 (remarks of Douglas Cifu, Chief Executive Officer,

participants in order flow relationships "may not negotiate the terms of order routing arrangements for those customer orders in a manner that reduces the price improvement opportunities that otherwise would be available to those customer orders absent payment for order flow" as inconsistent with their respective best execution obligations.[125] Furthermore, the SEC later observed, without identifying any specific entities, that, "[w]hile firms had discussions with their execution venues regarding an increase (decrease) in PFOF for a corresponding decrease (increase) in price improvement ('PI') and thereby lower (higher) execution quality ('EQ') [the effective-to-quoted spread ratio], firms did not disclose the PFOF and PI/EQ trade-off in their Rule 606 reports."[126] Such conflicts of interest may be countered by the practice adopted by certain customer-facing brokerage firms of accepting equal PFOF rates from all partner wholesalers,[127] but this approach does not necessarily ensure that every *alternative* wholesaler is evaluated on the basis of price improvement.[128]

Virtu Financial, Inc.) ("Overall . . . through the course of a month, we will provide more price improvement to Fidelity [that does not accept PFOF] than we do to Robinhood [that does].").

[125] FIN. INDUS. REGUL. AUTH., INC., REGULATORY NOTICE NO. 21-23, BEST EXECUTION AND PAYMENT FOR ORDER FLOW 4 (June 23, 2021), https://www.finra.org/sites/default/files/2021-06/Regulatory-Notice-21-23.pdf [https://perma.cc/H48X-FSBV].

[126] SEC'S RISK ALERT ON RULE 606 DISCLOSURES, *supra* note 110, at 5–6.

[127] *See, e.g.*, E*TRADE Sec. LLC, Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2022, at 1–3 (July 27, 2022), https://cdn2.etrade.net/1/22072812590.0/aempros/content/dam/etrade/retail/en_US/documents/pdf/order-routing-reports/2022/606-ETRS-2022Q2.pdf [https://perma.cc/LD8Y-LBVN] (listing near-identical PFOF rates offered by various wholesalers, maintaining that there are no order flow arrangements with such wholesalers that "require E*TRADE to meet certain volume thresholds or that provide incentives to E*TRADE for meeting or exceeding certain volume thresholds," "require E*TRADE to meet certain minimum volume thresholds or that provide disincentives to E*TRADE for failing to meet certain minimum volume thresholds," are based on "volume-based tiered payment schedules," or "require E*TRADE to route any orders or a minimum number of orders," and disclosing that "[t]here is a potential conflict inherent to a market maker . . . both paying for order flow and providing price improvement, as the potential source of funds for each is the same, namely the anticipated profit the market maker seeks to earn from executing or facilitating the execution of E*TRADE customer orders"); Robinhood

Some recent empirical evidence on the existence of the tradeoff between price improvement and PFOF is provided by two experimental studies of controlled trading activities, which, however, relied on different methodologies and data sets. The first study concluded that, while "execution prices [provided by wholesalers] vary significantly across brokers," "variation in PFOF does not explain the large variation in price execution."[129] Focusing on five leading zero-commission brokers and six leading wholesalers, the study concluded that "wholesalers [are] systematically giving different execution prices for the same trades of different brokers."[130] On the other hand, the study acknowledged that, "due to clientele differences across retail brokers, the quality of order flow could also differ across brokers" and found evidence consistent with the hypothesis that "variation in the quality of order flow, measured by order imbalance,

---

Sec., LLC, Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2022, at 1 (July 28, 2022), https://cdn.robinhood.com/assets/robinhood/legal/RHS%20SEC%20Rule%20606%20and%20607%20Disclosure%20Q2%202021.pdf [https://perma.cc/25MD-GRJX] ("The payment varied based upon a fixed percentage of the spread between the National Best Bid and National Best Offer for the security at the time of order execution. The fixed percentage is the same for all non-exchange third-party market centers to which Robinhood Securities routes equity order flow."); TD Ameritrade Clearing, Inc, Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2022, at 1 (July 18, 2022), https://www.tdameritrade.com/content/dam/tda/retail/marketing/en/pdf/cftc/tdac-TDA2054-q2-2022.pdf [https://perma.cc/2GJX-CKZC] ("All market makers pay the same rate for each respective order flow type. TD Ameritrade does not negotiate payment as a condition for sending more order flow to a market maker."); TradeStation Sec., Inc., Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2022, at 2 (July 27, 2022), https://uploads.tradestation.com/uploads/2022-Q2-SEC-Rule-606-607.pdf [https://perma.cc/3LM7-ZDJD] ("TradeStation established the same per share rate, based on order type, with all non-exchange routing venues to which it routed orders.").

[128] *See, e.g.*, SEC'S RISK ALERT ON RULE 606 DISCLOSURES, *supra* note 110, at 5 n.18 ("Some firms informed Staff that they had eliminated any PFOF conflicts by negotiating the same PFOF rates for all of the execution venues and not factoring those payments into the firms' routing decisions. However, those inducements for routing orders must still be disclosed because the firm may be influenced, for example, not to route orders to venues that do not pay the same PFOF as the firm's current execution venues.").

[129] Christopher Schwarz et al., The "Actual Retail Price" of Equity Trades, at i (July 17, 2023) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=4189239.

[130] *Id.* at i, 1–2.

could potentially explain the range of price dispersion observed."[131] By contrast, another study compared two leading zero-commission brokers, Robinhood and TD Ameritrade, with Interactive Brokers as a "direct orders" / non-wholesaler comparative.[132] Ultimately, this study found "evidence . . . consistent with the notion that Robinhood has effectively negotiated to allocate the PFOF surplus between itself and the wholesaler, and does not pass along any portion of the surplus to the retail customers."[133] Moreover, Robinhood's customers do not appear to have realized a tangible benefit from segmentation: "Using direct orders as a baseline, across all measures of price-based execution quality I find that orders transmitted to TDA [TD Ameritrade] receive economically and statistically significant improvement. In contrast, across all measures of price-based execution quality I find no evidence of improvement for orders transmitted to Robinhood."[134] In addition, Robinhood's orders appear to be executed slower than TD Ameritrade's, with "PFOF orders execut[ing] much more slowly than direct orders" overall.[135] In

---

[131] *Id.* at 3–4.

[132] Bradford (Lynch) Levy, Price Improvement and Payment for Order Flow: Evidence from a Randomized Controlled Trial 2, 11–12 (June 2022) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=4189658.

[133] *Id.* at 5.

[134] *Id.* at 24. A related key conclusion is that "direct orders receive economically and statistically significant price improvement relative to the NBBO [which] suggests that prior studies relying on the NBBO as a baseline for price improvement have over-stated the benefits of PFOF to retail investors." *Id.* at 4. For an alternative perspective on the magnitude of price improvement offered by Robinhood, which, however, was measured relative to the NBBO, see S.P. Kothari et al., Commission Savings and Execution Quality for Retail Trades (Dec. 2021) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=3976300.

[135] Levy, *supra* note 132, at 5, 17. The same study concluded that, "while most direct orders execute in less than 100 ms [milliseconds], almost zero PFOF orders execute within 250 ms." The SEC's empirical analysis made a very different conclusion: "While there is substantial variation in time to execution for both internalized orders and orders routed to other market centers, internalized order [sic] are executed more quickly, especially for orders with the slowest execution times (*i.e.*, greater than or equal to the 75th percentile). The median execution time for rerouted orders was 24 milliseconds (0.024 seconds), about seven times longer than the median execution time for internalized orders, which equaled 3.6 milliseconds (*i.e.*, 0.0036 seconds)." Order Competition Rule Proposal, *supra*

turn, the SEC's empirical analysis provided support for the existence of the tradeoff between price improvement and PFOF, while identifying the limitations of the above-mentioned studies:

> Importantly, both studies only included trades that were initiated by the authors and do not include other trades that were handled by the brokers in their samples, preventing them from examining the attributes of a typical retail order handled by each broker. As such, these studies would not observe the variation in price improvements that reflect differences in the adverse selection risk associated with the order flow of different brokers, and hence, would likely conflate the impacts of PFOF with that of adverse selection risk. That is, these studies cannot control for the possibility that a wholesaler would offer smaller price improvement to order flows with higher adverse selection risk. In contrast, the Commission relies on CAT [the Consolidated Audit Trail] data to examine the adverse selection risk at the broker level, which is a determinant of the amounts of price improvements that a given wholesaler would offer to different brokers. The regression framework [in the SEC's study] controls for the adverse selection risk of the retail broker and finds that [it] has a negative relationship with the magnitude of price improvement their customers' orders receive. We also find a negative relationship between the amount of PFOF a broker-dealer receives and the magnitude of the price improvement their customers' orders receive after controlling for the retail broker adverse selection risk.[136]

---

note 2, at 196. From a historical perspective, execution speed has been one of the chief attractions of the business model of off-exchange market making relative to routing to securities exchanges. *See, e.g.*, SEC'S 1963 SPECIAL STUDY, *supra* note 19, pt. 2, ch. VIII(D), at 905–06, https://books.google.com/books?id=nVATAQAAMAAJ ("The market makers assert their ability to provide speedier executions, since they can close a transaction immediately while orders on the Exchange must go to the floor and are subject to the impact of forces there. Apparently some investors agree with them . . . . Further, where secrecy is important over-the-counter executions can provide a veil of obscurity."); SEC Roundtable on Commission Dollar and PFOF Practices, *supra* note 92, at 123 (remarks of William F. Devin, Senior Vice President, Fidelity Brokerage Services, Inc.) ("The public's view of best execution is not just in price but also in speed of execution. . . . The firms that we are dealing with and receiving payment from are not only sending us the payment, but also sending us that execution in around five seconds. We are clearly able to hold a customer on the phone and give him that report, and it makes him very happy . . . ."); CHARLES SCHWAB, *supra* note 99, at 11 ("The characteristics of retail flow allow the wholesalers to provide . . . fast execution speed.").

[136] Order Competition Rule Proposal, *supra* note 2, at 197 n.456. For a criticism of the SEC's own methodology with respect to its analysis of the tradeoff between price improvement and PFOF, see S.P. Kothari, Gordon Y Billard Professor of Acct. and Fin., Sloan Sch. of Mgmt., Mass. Inst. of Tech. & Travis L. Johnson, Assoc. Professor of Fin., Univ. of Tex. at Austin, Comment Letter to the SEC on the Order Competition Rule Proposal (June 19, 2023), https://www.sec.gov/comments/s7-31-22/s73122-207259-418082.pdf [https://perma.cc/5VHT-7YRF]; Christopher Schwarz & Philippe Jorion, Univ. of Cal., Irvine, Comment Letter to the SEC on the Order Competition Rule

The SEC's empirical analysis specifically pointed to evidence "indicat[ing] that the orders of retail brokers in the higher adverse selection quintiles handled by wholesalers receive worse execution quality, as measured by higher effective spreads and E/Q [effective-to-quoted spread] ratios, than the orders of retail brokers in the lower adverse selection quintiles."[137]

Any imperfections of competitive forces also weave into the theme of whether order-by-order competition, as contrasted to the current market structure, would result in more efficient risk sharing among a variety of market participants, such as institutional and retail investors or other market makers. A related issue, as exemplified by the concern over "inaccessible liquidity" for institutional investors, is whether order-by-order competition could enhance direct interaction of natural liquidity, potentially decreasing both trading costs and economic rents of wholesalers from some degree of disintermediation.[138] That is not to suggest that the market making function

---

Proposal 1–3 (Mar. 29, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20161902-330726.pdf [https://perma.cc/K8B9-KVAY].

[137] Order Competition Rule Proposal, *supra* note 2, at 197.

[138] *See, e.g.,* Hitesh Mittal, Founder & Chief Exec. Officer, BestEx Rsch. Grp. LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 3 (Mar. 29, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162950-332901.pdf [https://perma.cc/FH9G-72LP] [hereinafter BestEx's Comment Letter on the Order Competition Rule Proposal] ("Liquidity on exchanges is provided by both market makers and liquidity-seeking traders, including institutional investors. While market makers seek profit from providing liquidity, institutional investors use limit orders to reduce their costs in seeking liquidity. For institutional investors, as long as realized spreads are higher than negative 50% of quoted spread, it is more profitable to provide liquidity than to cross the spread."); *Market Structure Wave: BMO's Joe Wald on Best Ex and Reg NMS 2.0*, TABB F., at 4:22–:38 (Aug. 8, 2022), https://tabbforum.com/videos/market-structure-wave-bmos-joe-wald-on-best-ex-and-reg-nms-2-0/ (remarks of Joe Wald, Managing Director and Co-Head of Electronic Trading, BMO Capital Markets) ("[T]here is a tremendous amount of liquidity, we see it every day with our institutional clients, that sits there at the midpoint while [retail] orders are executed [by a wholesaler] at maybe a tenth of a penny better, and just those orders never get an opportunity to meet in a right way."). A related empirical study focusing on a potential mode of intermediation by wholesalers *between* retail and institutional investors concluded that "large imbalances in observable internalized retail trades . . . reflect the internalized retail orders used by wholesalers to balance their

and specialized liquidity providers themselves could be completely disintermediated. It is telling, as expressed by a representative of the institutional investor community, that such market participants are not seeking to replace market makers, that they are generally takers of liquidity, and that "retail activity and institutional activity [do not necessarily] blend together well," for instance, in connection with one-sided waves of trading activity in "meme stocks."[139] Yet another factor is the extent of the overlap between institutional and retail trading.[140]

---

inventories when providing liquidity to institutional investors." Yashar H. Barardehi et al., Internalized Retail Order Imbalances and Institutional Liquidity Demand 2 (rev. Jan. 2, 2023) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=3966059.

[139] *SIFMA Equity Market Structure Roundtable* [Part I], SIFMA, at 2:14:14–:17:03 (Sept. 13, 2022), https://events.sifma.org/equity-market-structure-roundtable [https://vimeo.com/749655038] [hereinafter *SIFMA Equity Market Structure Roundtable, Part I*] (remarks of Mehmet Kinak, Global Head of Systematic Trading & Market Structure, T. Rowe Price).

[140] *See, e.g.*, Douglas A. Cifu, Chief Exec. Officer, Virtu Fin., Inc., Comment Letter to the SEC on the Order Competition Rule Proposal 36 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162480-331492.pdf [https://perma.cc/2TMP-AS3N] [hereinafter Virtu Financial's Comment Letter to the SEC on the Order Competition Rule Proposal] ("Virtu's own analysis suggests that the overlap between retail and institutional interests is quite low. Virtu compared the retail and institutional trade activity in the Top 500 symbols traded in the first quarter of 2021 and found that only 8% of retail volume was in the Top 500 symbols, and only 26% was in Russell 3000 symbols."), Dyhrberg et al., *supra* note 100, at 7–8, 31 ("[Based on the data for eight wholesalers from January 2019 to December 2022] as we move to less liquid stocks, it becomes clear that retail order flow swamps institutional trading interest. Already for Tercile 1 stocks, institutional trading interest starts becoming insufficient on average as the ratio of retail to institutional interest exceeds one. For Tercile 2 stocks, retail interest is more than double the institutional interest, and for Tercile 3 stocks, the average retail order flow is almost ten times larger than institutional interest. The ratios are highly skewed, suggesting that retail interest tends to be focused on particular stocks and that institutions do not favor those stocks. If we switch our attention to the median values for a more conservative view, we observe that institutional interest is substantially below retail interest only for Tercile 3."); *see also* LARRY TABB ET AL., BLOOMBERG INTELLIGENCE, US RETAIL TRADING: HOW AND WHAT RETAIL IS TRADING: PRICE IMPROVEMENT, PFOF & INDUSTRY ECONOMICS 20 (Mar. 2023) (analyzing retail trading activity through seven leading wholesalers in September 2022 and concluding that only twenty-six symbols generated 50% of trading volume).

Evaluating these theories and interpreting the existing empirical evidence is no easy task. For instance, one industry study concluded that the current market structure "has taken valuable liquidity out of the marketplace [resulting in] significantly higher costs and volatility in 'retail' names for mutual funds and hedge funds,"[141] while another one maintained that "stocks with the highest rates of inaccessible liquidity see significantly higher slippage versus arrival costs when executing liquidity-seeking orders."[142] While this empirical evidence supporting the hypothesis of potential costs for the lit market is a proxy for a marketwide cost, it is also ambiguous in the sense that the segmented lit and dark components have to be analyzed together. The concept, which is almost true by definition, that the diversion of "safer" retail order flow off-exchange increases transaction costs in the lit market has been known for decades.[143] The other side of the

---

[141] Linda Giordano & Jeff Alexander, *Meme Stocks: Inaccessible Trading Share, Trading Cost, and Risk*, BABELFISH ANALYTICS (Feb. 5, 2021), https://www.babelfishanalytics.com/news/2021/2/4/meme-stocks-inaccessible-trading-share-trading-cost-and-risk [https://perma.cc/F74J-KURF].

[142] Jennifer Hadiaris, *Retail Trading – What's Going on, What May Change, and What Can You Do About It?*, COWEN, INC. (Mar. 23, 2021), https://www.cowen.com/insights/retail-trading-whats-going-on-what-may-change-and-what-can-institutional-traders-do-about-it/ [https://perma.cc/7PDZ-GZEY].

[143] As this argument has been described in an early academic study, "Unlike NYSE specialists, who must make a market for all NYSE-listed stocks, purchasers of order flows can target the more profitable 'low end' business, which consists mainly of small trades in more liquid stocks. The NYSE specialist, finding profit margins reduced, may look to recover these losses by increasing the quoted spreads and, thus, the overall liquidity costs." Charles M.C. Lee, *Market Integration and Price Execution for NYSE-Listed Securities*, 48 J. FIN. 1009, 1014 (1993). For a survey of earlier studies on several relevant topics, see Anton Golub et al., *The Impact of Internalisation on the Quality of Displayed Liquidity* (Foresight, U.K. Office for Sci., No. EIA10, 2012), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/289048/12-1071-eia10-impact-internalisation-on-quality-of-displayed-liquidity.pdf [https://perma.cc/7SQK-TPHY]. For another earlier academic study focusing on the role played by BLMIS, see Robert H. Battalio, *Third Market Broker-Dealers: Cost Competitors or Cream Skimmers?*, 52 J. FIN. 341 (1997). Moreover, even the parent company of today's leading off-exchange market maker took a critical view on the impact of wholesaling on the lit market in the past: "As more and more brokers engage in the practice of internalization, bid-ask spreads in the public markets will continue to be wider than they otherwise would, quoted liquidity will continue to fall and the role and value of the public markets will be greatly diminished. Furthermore, as bid-ask spreads widen in response to internalization,

coin is that retail order flow can be provided price improvement *compared* to the relevant benchmark in the lit market. In fact, a key industry study maintained that "retail investors currently receive an average of 24.5% price improvement from wholesalers [and] other market participants are receiving an average of 8.7% of the [NBBO-based bid-ask] spread on exchanges."[144] Importantly, this very feature of the current market structure has been hailed as a key advantage for retail order flow: "The fact that US equity market structure has enabled such a segmentation of retail order flow is the underlying driver of the value that retail investors have been able to increasingly participate in."[145] However, the very existence of price improvement relative to the NBBO provided to retail order flow[146] or even its specific amount[147] does not

---

aggressive broker-dealers will be able to internalize an ever increasing portion of their order flow, sending only the most challenging of orders into the market place for execution – and only further worsening the situation corroding the value of the market." Kenneth Griffin, President & Chief Exec. Officer, Citadel Inv. Grp., L.L.C., Comment Letter to the SEC on Regulation NMS Proposal 8 (July 9, 2004), https://www.sec.gov/rules/proposed/s71004/s71004-436.pdf [https://perma.cc/9AUY-42W6] [hereinafter Citadel's Comment Letter on Regulation NMS Proposal].

[144] MITTAL & BERKOW, *supra* note 115, at 9. By contrast, an academic study from three decades ago found that "off-Board trades generally involve higher execution costs" and interpreted the evidence as "suggest[ing] that the high execution costs in the off-Board trades [are] sufficient to cover the cost of [PFOF]." Lee, *supra* note 143, at 1023.

[145] CHARLES SCHWAB, *supra* note 99, at 7.

[146] *See, e.g.*, U.S. Sen. Thom Tillis et al., Comment Letter to the SEC on the Market Structure Rule Proposals 1–2 (Jan. 20, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20163812-333928.pdf [https://perma.cc/3UF2-FVES] ("[M]ultiple independent academic analyses found zero evidence that the practice [of PFOF] leads to retail investors getting worse prices on stock trades. In fact, analysis conducted by Massachusetts Institute of Technology (MIT) researchers provided compelling evidence that retail investors received superior 'price improvement' and execution quality under [that] order routing system." (citing Kothari et al., *supra* note 134)).

[147] *See, e.g.*, CHARLES SCHWAB, *supra* note 99, at 13 (a retail brokerage firm claiming that "routing to wholesalers saved Schwab's clients at least $3.4B in 2021, vs. what their outcomes would have been from utilizing exchanges" and that "Schwab clients received $4.4B+ in value from size improvement across all orders in 2021"); Cifu, *supra* note 95, at 2–3 (a wholesaler claiming that "Virtu alone provided over $3B in Real Price Improvement to retail investors in 2020," including size improvement); Robert Battalio & Robert Jennings, Absolute and Relative Wholesaler Execution Quality in May 2022, at 39–40 (rev. July 28, 2023) (unpublished manuscript) (on file with

necessarily indicate that such investors are better off. Moreover, in addition to estimates of aggregate price improvement, another dimension could contextualize such amounts on a per share basis and their distribution, including such considerations as de minimis price improvement and the frequency of price improvement of at least one tick size.[148]

---

author), https://ssrn.com/abstract=4304124 (an academic study concluding that "the estimated value of this 'size improvement' [provided by wholesalers] increases the net price improvement reported in the mandated SEC Rule 605 reports by a factor of 6.5 times" and that, "[i]n addition to providing price improvement to orders covered by SEC Rule 605, the wholesaler(s) offers price improvement to odd lots (even after quote benchmark prices are adjusted to include displayed odd lot limit orders) and short sell orders").

[148] *See, e.g.*, Order Competition Rule Proposal, *supra* note 2, at 192 (stating that "wholesalers . . . offer less than 0.1 cents price improvement to approximately 18.6% of shares that they execute [and they] execute more than 65% of shares at sub-penny prices, with over 40% of shares being executed at prices with four decimal points (*i.e.*, the fourth decimal place is not equal to zero"); NASDAQ, INC., OPTIMIZING MARKETS FOR TODAY AND TOMORROW: A FRAMEWORK FOR U.S. EQUITIES MARKET REFORM 4–5 (2022), https://www.nasdaq.com/docs/optimizing-markets-for-today-and-tomorrow (discussing the distribution of price improvement, while separating tick-constrained and non-tick-constrained stocks, and concluding that "a large percentage of retail orders executed off-exchange receive what is often described as *de-minimis* price improvement"); Dave Lauer, *How's That Price Improvement Working out for You?*, URVIN FIN. (Jan. 24, 2022), https://blog.urvin.finance/post/how-is-that-price-improvement-working-out-for-you [https://perma.cc/48WG-XHJN] (discussing the distribution of price improvement, concluding that "15%–20% of all sub-penny off-exchange trades receive 1 mil [one-hundredth of one cent] of price improvement, regardless of the spread," and documenting "another phenomenon in the data that shows a preference for 10 mils of price improvement as well, which suggests some static settings that are not optimizing for execution quality dynamically"); *GameStop Senate Hearing*, *supra* note 5, at 58 (prepared statement of Michael S. Piwowar, Executive Director, Milken Institute Center for Financial Markets) (analyzing trading activity of three wholesalers in GameStop in January 2021 during the "meme stocks" retail trading frenzy and concluding that "[t]he average price improvement ranged from $0.03 to $0.06 per share"). *See also* Jeffrey Alexander, Founder & President, and Linda Giordano, Founder & Chief Exec. Officer, Babelfish Analytics, Inc., Comment Letter to the SEC on the Order Competition Rule Proposal 3–4 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20163320-333786.pdf [https://perma.cc/7YAN-DU5C] ("[T]en names represent almost 20% of all price improvement in marketable orders [for a group of wholesalers from January 2020 to December 2022]. In addition, 200 names drive half of all marketable order price improvement (and under 600 names drive two-thirds of price improvement. . . . It is clear that the provision of price improvement is concentrated in a select number of the most widely traded stocks." (endnote omitted)).

Indeed, it is critical to compare the current market structure to its alternatives. Accordingly, one industry study critiqued the assumption that "[t]he NBBO spread would remain the same even after retail flow moved to exchanges."[149] Furthermore, it compared the relative magnitudes of the existing price improvement practices and the hypothetical compression of bid-ask spreads with retail order flow being routed directly to securities exchanges rather than wholesalers: "Considering a reduction in the NBBO spread by over 25% [under the hypothetical alternative], the price improvement currently received by retail investors (about 15% of [the] NBBO spread as discussed earlier) is not the 'deal' it is advertised to be."[150] A concern about limited interaction of retail market and limit orders under the current market structure is also notable: "[L]imit orders from retail investors lose the opportunity to interact with retail market orders and instead only interact with the more toxic flow on exchanges, yielding the same higher adverse selection and lower fill rates other investors face."[151] It has also been argued that a greater level of interaction of retail and institutional orders would yield an additional benefit: "If institutional investors have the ability to interact with marketable retail flow, they will likely experience improved fill rates and reduced adverse selection and make more use of limit orders and hidden midpoint orders, reducing effective spreads even further."[152] By contrast, another empirical study comparing the current market structure to its hypothetical all-to-all alternative concluded that retail customers are better off now:

> On the positive side, the retail flow will pay considerably less in realized spreads. However, there is also a negative effect to consider. When combined with institutional flow, retail investors will bear the cost of the resulting mix's higher toxicity, which exceeds that of pure retail flow. The sum of these two effects is

---

[149] MITTAL & BERKOW, *supra* note 115, at 8.

[150] *Id.* at 14.

[151] *Id.*

[152] *Id.* at 18.

> negative for retail investors, meaning they would be worse off if their order flow were routed to exchanges.[153]

Ultimately, there could be an extensive debate on the applicable methodology and data samples for a proper comparison of the magnitudes in question, as there are competing ways of measuring price improvement offered by wholesalers under the current market structure,[154] let alone an estimate of execution quality under a hypothetical market structure.[155] However, the chartered approach is critical for making meaningful policy decisions. A mere more favorable treatment of retail order flow relative to the lit market does not constitute conclusive evidence in support of the current market structure, as illustrated by the following argument:

> Some argue that displayed quotes would tighten if retail order flow were required to be traded on exchanges. Today, market makers face less adverse selection on marketable retail order flow than on professional order flow, which is why they are willing to provide retail orders with better prices, or a better "effective spread". Forcing all market participants to anonymously send their marketable order flow to exchanges would result in both retail and professional investors

---

[153] Dyhrberg et al., *supra* note 100, at 27. The study also made the following conclusion about the magnitudes of wealth transfers: "Our calculations show that retail investors in our sample of equities would lose $221 million per month if their orders were to be routed to exchanges. They also face an increase in effective spreads of 38.5%. . . . By contrast, institutional investors gain a total of $518 million per month because the toxicity they have to pay for in the pooled setting is lower than it is currently, and their effective spreads decline by 9.3%." *Id.* at 28.

[154] *See, e.g.*, Samuel Adams et al., Do Investors Save When Market Makers Pay? Retail Execution Costs Under Payment for Order Flow Models 4 (Nov. 2021) (unpublished manuscript) (on file with author), https://ssrn.com/abstract=3975667 (maintaining that "NBBO-based price improvement measures overstate economic savings by a factor of at least three"); Cifu, *supra* note 95, at 3 (presenting a revised methodology for measuring price improvement "by including odd lot and short sell orders and updating the benchmark price to be the average price available for the same quantity of shares considering all displayed quotes – NBBO, depth of book and odd lots"); *see also* Order Competition Rule Proposal, *supra* note 2, at 189 tbl.5 (estimating the effective-to-quoted spread ratio provided to market and marketable limit orders in NMS common stocks and exchange-traded funds during the first quarter of 2022 by wholesalers as a group at 0.48).

[155] *See also* Adams et al., *supra* note 154, at 12–13 ("Ideally, we would compare the execution costs retail traders incur in the current environment with a counterfactual cost they would pay if, say, payment for order flow arrangements did not exist and their trades were exclusively routed to the public stock exchanges. Of course, such counterfactual is not observable . . . .").

> receiving the same experience, which means that compared to the current structure, professionals may receive better prices – but this would come directly at the expense of retail investors. The result would be a transfer of wealth from retail investors to institutional participants and professional traders.[156]

Additionally, even from a distributional perspective, numerous institutional investors "ultimately represent retail investors."[157] Even more so, dropping the assumption of an anonymous admixture of all orders on securities exchanges, retail order flow could realize an additional benefit from *on-exchange* segmentation with corresponding pricing advantages combined with order-by-order competition among a variety of market participants. This type of segmentation is already offered by several securities exchanges, as most prominently illustrated by the existing "retail liquidity programs" ("RLPs") for retail order flow.[158] However, more generally, "moving retail flow to a public forum would likely require regulatory changes."[159] Also, under the current market structure, it would be problematic for any given retail brokerage firm to jettison order routing arrangements with wholesalers even when all conflicts of interest are assumed away:

> [I]t would be a comparative disadvantage for an individual retail broker who routes orders away from wholesalers to exchanges, because relative to other retail brokers, its customers would receive poorer pricing. This retail broker's order flow would decrease the NBBO spread only slightly on exchanges. And other retail brokers (sending order flow to wholesalers) would still receive better prices than the retail broker that shifted its flow to exchanges.[160]

---

[156] CHARLES SCHWAB, *supra* note 99, at 18.

[157] MITTAL & BERKOW, *supra* note 115, at 18.

[158] For an illustration of an RLP, see N.Y. STOCK EXCH. LLC, THE NEW YORK STOCK EXCHANGE'S RETAIL LIQUIDITY PROGRAM (2021), https://www.nyse.com/publicdocs/nyse/markets/liquidity-programs/RLP_Fact_Sheet.pdf [https://perma.cc/T7HU-8M6N]. For a discussion of the basic features of RLPs, see Order Competition Rule Proposal, *supra* note 2, at 186–87.

[159] MITTAL & BERKOW, *supra* note 115, at 18.

[160] Hitesh Mittal, *Payment for Order Flow: A Prisoner's Dilemma*, LINKEDIN (May 10, 2021), https://www.linkedin.com/pulse/payment-order-flow-prisoners-dilemma-hitesh-mittal/ [https://perma.cc/9P3K-9LHN].

Another closely related issue is the frequency of midpoint executions in wholesaling under the current market structure, which serves as a proxy for the compression of bid-ask spreads, and its implications for the economics of liquidity provision. For instance, one retail brokerage firm made the claim that "50% of Schwab's market orders receive midpoint execution."[161] Moreover, an empirical study argued that executions at midpoint or better obtained by leading retail brokerage firms ranged from 16 to 69%.[162] Given that the study used the NBBO as a benchmark and focused on smaller $100 orders, the following observation should be noted: "The NBBO benchmark is based on orders for 100 shares or more (round lots), while odd lots now account for more than 60% of all trades. As a result, the NBBO is an easy benchmark to beat, with trades routinely executing within the NBBO spread."[163] In turn, the SEC's much more comprehensive empirical analysis of orders internalized by wholesalers had concluded that they "executed 46.05% of shares at midpoint or better and 32.23% of shares at midpoint."[164] However, the same analysis of a related data sample made a key observation:

> [O]n average, 51% of the shares of individual investor marketable orders internalized by wholesalers are executed at prices less favorable than the NBBO midpoint . . . . Out of these individual investors shares that were executed at prices less favorable than the midpoint, on average, 75% of these shares could have hypothetically executed at a better price against the non-displayed liquidity resting at the NBBO midpoint on exchanges and NMS Stock ATSs.[165]

While the regulatory agency pointed out that, "if wholesalers wanted to detect this hidden liquidity, they would have had to ping each individual exchange or NMS Stock ATS to see if midpoint liquidity was available on that venue,"[166] the key implication zeroed in "on the

---

[161] CHARLES SCHWAB, *supra* note 99, at 20.

[162] Schwarz et al., *supra* note 129, at 18.

[163] *Id.* at 4, 16, 18 (footnote omitted).

[164] Order Competition Rule Proposal, *supra* note 2, at 215 n.578.

[165] *Id.* at 209–10 (footnote omitted).

[166] *Id.* at 210.

availability of liquidity at the NBBO midpoint for a large share of individual investor orders that currently receive executions at less favorable prices than the NBBO midpoint and therefore could potentially execute at a price equal to the NBBO midpoint under qualified auctions."[167]

Taking a step back, it is also critical to evaluate the arguments defending the current market structure from the standpoint of the range of services provided by wholesalers. For instance, as described by a leading retail broker,

> In the current market, Schwab typically routes client equity orders to non-exchange market centers [i.e., wholesalers], which is a form of strategic outsourcing that leverages the concept of comparative advantage. This model allows brokers (e.g., Schwab) to focus on providing low-cost access to the markets, omni-channel services, financial planning, and broader wealth management services – while non-exchange market centers can focus and invest heavily in sophisticated order routing / liquidity seeking capabilities, cutting-edge and resilient technology platforms, and highly specific risk management capabilities.[168]

Key arguments in favor of order flow arrangements between brokerage firms and wholesalers under the current market structure include "access[ing] markets and pools of liquidity to which [retail brokers] do not have direct connections (both on- and off-exchange),"[169] "navigat[ing] the complex order types and fee schedules of exchanges and ATSs,"[170] "provid[ing] enhanced fill rates [by] significantly increasing the likelihood that a non-marketable order is filled in its entirety compared to routing directly to an exchange,"[171] "incur[ring] meaningful trading fees to execute orders at exchanges and ATS[s], an expense . . . expect[ed to] fall to retail brokers if they

---

[167] *Id.*

[168] CHARLES SCHWAB, *supra* note 99, at 8.

[169] *Id.* at 9.

[170] *Id.* at 9.

[171] *Id.* at 10.

routed orders directly to these market centers,"[172] providing additional price improvement "by improving the execution prices for shares filled on exchanges and ATSs,"[173] and, more generally, "navigat[ing] and extract[ing] the fragmented liquidity that spans across public and private trading venues."[174] In addition to the regulatory requirement for wholesalers to display non-marketable limit orders, the reality is that a non-trivial portion of market and marketable limit orders are effectively routed away and executed elsewhere.[175] Moreover, there is a debate on

---

[172] Cifu, *supra* note 95, at 5. However, in addition to bearing certain fees, at least some wholesalers collect exchange rebates in connection with certain types of orders instead of remitting such rebates to brokerage firms, which might be a common practice. *See, e.g.*, E*TRADE Sec. LLC, Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2022, at 2 (July 27, 2022), https://cdn2.etrade.net/1/22072812590.0/aempros/content/dam/etrade/retail/en_US/documents/pdf/order-routing-reports/2022/606-ETRS-2022Q2.pdf [https://perma.cc/LD8Y-LBVN] ("In addition to revenues that Citadel may collect for executing or facilitating the execution of E*TRADE customer orders, Citadel also receives remuneration from U.S. securities exchanges to which it routes or directs E*TRADE customer orders in the form of rebates. Although E*TRADE has no knowledge of any facts to suggest that such is the case, these U.S. exchange rebate payments could, in theory, incentivize Citadel to route higher percentages of E*TRADE customer orders to particular venues over others, subject to Citadel's independent order routing and best execution obligations. Exchange rebates provided to Citadel for E*TRADE customer executions are not passed through to E*TRADE or its customers. E*TRADE does not share directly in any such rebates Citadel receives for executions of E*TRADE customer orders, although Citadel's receipt of such rebates potentially increases Citadel's revenue and thereby the source of funds Citadel may use to provide price improvement to E*TRADE customers, order flow payment to E*TRADE, and/or a combination of such payments.").

[173] Cifu, *supra* note 95, at 5. A recent empirical study also asserted the existence of this subsidy provided by wholesalers for orders routed to other trading venues: "We . . . find that even when the wholesaler(s) chooses to externalize an execution, they improve the prices received from other trading venues. In our sample data, the wholesaler(s) provides sufficient supplemental price improvement for fully externalized orders, at their expense, to turn what would have resulted in price disimprovement for the average fully externalized order in May 2022 into a modest level of price improvement." Battalio & Jennings, *supra* note 147, at 39.

[174] CHARLES SCHWAB, *supra* note 99, at 13.

[175] *See, e.g.*, Order Competition Rule Proposal, *supra* note 2, at 204–05 ("Commission analysis shows that wholesalers internalize over 90% of the executed dollar value in NMS stocks from the marketable order flow routed to them by retail brokers, which amounts to more than 80% of share volume."); Douglas Cifu, Chief Exec. Officer, Virtu Fin., Inc., Statement Before the SEC Investor Advisor Committee (June 10, 2021), *reproduced in* Virtu Fin.,

whether the rerouted portion of marketable order flow represents toxic exhaust or merely reflects risk management, but probably both of these factors have a role to play.[176] In any instance, such

---

Inc, Current Report (Form 8-K) Exh. 99.1, at 5 (June 10, 2021), https://www.sec.gov/Archives/edgar/data/1592386/000110465921079146/tm2119142d1_ex99-1.htm [https://perma.cc/2UF3-W6LK] ("We . . . commit[] capital and internaliz[e] approximately 70% of marketable orders and by sourcing inventory from other market centers to fill the remaining 30%. These retail orders indirectly interact with liquidity on exchanges and ATSs when wholesalers go to these market centers seeking midpoint or other price improvement. . . . As for non-marketable orders, Virtu reflects a substantial percentage of these orders on lit exchanges and all wholesalers must reflect such orders in accordance with the requirements of the 'Limit Order Display' rule [Rule 604].").

[176] *See, e.g.*, John Ramsay, Chief Mkt. Pol'y Officer, Invs. Exch. LLC, Comment Letter to the SEC on IEX's Proposed D-Limit Order Type 10–11 (Aug. 3, 2020), https://www.sec.gov/comments/sr-iex-2019-15/sriex201915-7534417-222147.pdf [https://perma.cc/K23F-EGBG] (stating that "[a] wholesale broker's decision whether to internalize an order is perhaps the most critical decision in [the execution] process" and referencing the concept of exhaust); Gerko, *supra* note 95 (arguing that "[a]ny quantitative market maker given the choice of whether to internalize or externalize flow would be able to generate high toxic 'exhaust' flow which would have different characteristics from the original flow in aggregate by selecting 'good' 60% of their flow to internalize"); *Market Structure Conference 3.0 – Doug Cifu*, *supra* note 97, at 26:31–29:06 (rejecting the "exhaust" label, arguing that wholesalers often reroute such portion of order flow, which still has profitable execution characteristics, to each other, and stressing the role of risk parameters); *Market Structure Conference 3.0 – Equity Market Structure: Centralization or Segmentation?*, BLOOMBERG, at 24:02–25:00 (May 24, 2022), https://www.bloomberg.com/news/videos/2022-05-25/market-structure-conference-3-0-equity-market-structure-centralization-or-segmentation (remarks of Stephen Cavoli, Global Head of Execution Services, Virtu Financial, Inc.) (arguing that the primary reason for not internalizing such portion of order flow is approaching risk limits). The SEC's empirical analysis found evidence for the existence of very different characteristics of internalized and rerouted order flow: "Results also show that the marketable NMS stock orders wholesalers choose to internalize have less adverse selection risk: orders that wholesalers execute in a principal capacity have a price impact of 0.9 bps [basis points], compared to a price impact of 4.6 bps for those executed via other methods. These results stem from the incentives wholesalers face." Order Competition Rule Proposal, *supra* note 2, at 186 (footnote omitted). The same analysis also pointed to the evidence "indicating that wholesalers internalize a higher percentage of individual investor orders from retail brokers whose customers' orders on average exhibit lower price impact." *Id.* *See also id.* at 195–96 tbl.10 (presenting a detailed comparison of internalized and rerouted orders). On the other hand, one empirical study of internalized, partially internalized, and fully externalized orders handled by a leading wholesaler concluded that there are significant differences between these three types of orders, chiefly, average order size, with corresponding implications for an average price impact. Craig Lewis, Madison S. Wigginton Professor of Fin. & Professor of L., Vanderbilt Univ., The SEC's Proposed Rules for Equity Market Structure 43–52

arguments in defense of the status quo merely reflect the division of labor between customer-facing brokers and executing brokers, which does not hinge on the key features of the current market structure. The respective roles of an executing broker and a trading venue based on order flow arrangements and segmentation should be distinguished, as this division of labor is likely to emerge under an alternative market structure. While the range of services provided by an executing broker, under the current market structure or otherwise, is valuable, there is no inherent reason why such services should be "free" in the sense of being subsidized by wholesalers' trading profits. An alternative relationship between a customer-facing broker and an executing broker could be based on an explicit commission structure, whether a flat fee, cost-plus, or tied to some execution quality metric. This commission would ultimately be borne by customers, but they might be better off because of potentially better execution outcomes.

Ultimately, the benefits of the current market structure to the marketplace as a whole or certain groups of market participants, such as retail investors, must ultimately stem from the principal trading function of wholesalers rather than their role as executing brokers in the context of order flow relationships. Critically, the claim that, "without wholesalers, there would arguably be far less capital dedicated to providing immediate liquidity to retail customers"[177] simply cannot be unambiguously true, as there must be some reason why comparable levels of liquidity and efficiency could not be replicated in the aftermath of regulatory reforms. For instance, the argument that wholesalers "provide additional flexibility and are not subject to limited liability

---

(Mar. 28, 2023), *reproduced in* Virtu Financial's Comment Letter to the SEC on the Order Competition Rule Proposal, *supra* note 138.

[177] Jonathan Brogaard, Kendall D. Garff Chaired Professor, David Eccles Sch. of Bus., Univ. of Utah, Economic Analysis of the SEC's Proposed Best Execution and Order Competition Rules para. 25, at 14 (July 2023), https://www.sec.gov/comments/s7-32-22/s73222-221579-466122.pdf [https://perma.cc/M3JL-7PRL].

as are the exchanges"[178] is of particular significance for trade error-fixing and adjustments, which could be seen as more feasible for a trading venue merged with a principal trading entity rather than a neutral order matching facility.[179] Another potential source of economic efficiency is the very value of the aggregation of order flow, which cannot be assured on an order-by-order basis. As remarked in a leading industry report that captured the enduring key features of the business model of off-exchange market making decades ago,

> [T]he value in order flow is derived from the aggregation of small orders, and the benefits that accrue from aggregation cannot be translated after the fact to attach to each individual order. . . . Market makers or specialists benefit from a regular flow of orders that allows them to profit from the dealer's turn, to more easily trade in and out of positions, and to make use of information reflected in order flow regarding market sentiment.[180]

Another source of the current market structure's benefits to retail investors is the very existence of segmentation and size improvement, which is of importance to "retail investors when the marketable order size is larger than the number the shares displayed at the NBBO."[181]

---

[178] CHARLES SCHWAB, *supra* note 99, at 9.

[179] *See* Sandip Khosla, Gen. Couns., Two Sigma Sec., LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 5 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162765-332163.pdf [https://perma.cc/P9AS-A4MC] [hereinafter Two Sigma Securities' Comment Letter on the Order Competition Rule Proposal] ("Wholesalers generally step in to address technical issues or market aberrations at market centers if they negatively impacted the order execution experience for retail investors. This is particularly important given that such market centers typically have rules limiting their liability and the recourse available to impacted participants when outages or other technical issues occur. TSS [Two Sigma Securities] regularly engages with its routing partners to ensure that it provides consistently strong executions for orders routed to it and stands at the ready to remedy issues that may arise with any orders. TSS strives to provide the highest level of service when working with customers regarding any disruptions and provides accommodations to retail investors for erroneous orders. These benefits are not provided by exchanges . . . .").

[180] NASD, INDUCEMENTS FOR ORDER FLOW REPORT, *supra* note 92, at 23.

[181] Cifu, *supra* note 95, at 4. Importantly, enhancing depth available in the lit market has been a value proposition of off-exchange market makers for many decades, whether for institutional or retail order flow. *See, e.g.*, SEC's 1963 SPECIAL STUDY, *supra* note 19, pt. 2, ch. VIII(D), at 903, https://books.google.com/books?id=nVATAQAAMAAJ ("[T]he third market, whatever its effect on the depth of the primary market, provides the public customer with

A closely related argument is that dark liquidity is essential for managing adverse selection in the current market structure. As described by an executive of a leading wholesaler,

> If we posted today the size that we are two-sided in a thousand names on . . . national security exchanges right now, we would get trucked [and] picked off day and night by HFT [high-frequency trading] firms. . . . We have tried to post more size on exchanges around the world. What ends up happening? We get dramatically adverse selected.[182]

At the same time, there could be room for on-exchange segmentation with order-by-order competition for retail orders, large or otherwise, and the concern over adverse selection could be alleviated by the very nature of segmentation or by tweaking the mix of displayed and undisplayed liquidity. In any instance, the sheer amount of displayed liquidity cannot constitute a meaningful constraint on liquidity provided through bilateral relationships or signify a mere wealth transfer to retail investors provided by such relationships.

Perhaps one of the strongest arguments in defense of the current market structure with all of its major elements is that it allows wholesalers to support less liquid / less active / less profitable names at the expense of more desirable ones. For instance, an executive of a leading wholesaler remarked that retail brokers request wholesalers to support a wide range of names, with many of them "not of particular interest to the buyside [i.e., institutional investors]," and

---

overall markets of greater depth. The institutional customer with an order too large to be transacted on the auction market without effect on price and too large to be handled in its entirety by the specialist, can, and often does, trade with the market makers."); Bernard L. Madoff & Peter B. Madoff, Bernard L. Madoff Inv. Sec., Comment Letter to the SEC on the Payment for Order Flow Proposal 2 (Nov. 18, 1993) (on file with author) ("When Madoff receives a flow of orders representing the retail profile . . . we can offer that customer immediate liquidity at superior prices, often for a greater size than presently reflected in the marketplace. . . . It is important to note that only recently has the marketplace acknowledged the value of small retail order flow. For many years the small retail customer has subsidized larger institutional orders which have inherently greater risks for specialists and dealers.").

[182] U.S. Sec. & Exch. Comm'n, *2021 06 10 IAC Part 2* [the Investor Advisory Committee Meeting, June 10, 2021], YOUTUBE, at 1:15:37–:47, 1:17:53–:18:08 (Jan. 3, 2022) (remarks of Douglas Cifu, Chief Executive Officer, Virtu Financial, Inc.).

asserted that the nature of order-by-order competition would lead to an even further concentration of liquidity in the top one or two hundred names.[183] Likewise, according to a leading retail brokerage firm, "To compete for order flow, wholesalers are incentivized to internalize orders that would not otherwise get executed or would get executed at deteriorating prices because they are particularly difficult to trade and generally not profitable, such as orders in thinly traded stocks in which fewer market participants want to trade."[184] An academic study provided a similar description of the same rationale:

> Under broker's routing, a broker can evaluate a wholesaler on the performance across all orders, including different sizes, or stocks of different liquidity. This enables cross-subsidization, where wholesalers may make losses trading small stocks, compensated by profits trading large stocks. Switching to order-by-order auctions can substantially decrease market maker incentives to trade small stocks. As a result, the drop in small-stock liquidity, as well as retail investor welfare, can be particularly precipitous in smaller, less liquid stocks.[185]

Yet another commentator, as a criticism of the auction approach contemplated by the regulators, made the observation that "the broader the securities universe[,] the greater the likelihood that the wholesaler is accommodating orders in securities with increasingly limited liquidity (particularly, non-optionable stocks)" and pointed to "legitimate reasons why market makers need incentives to warehouse the risk of certain securities," while speculating that covering a

[183] *SIFMA Equity Market Structure Roundtable, Part I*, *supra* note 139, at 2:18:25–20:15 (remarks of Douglas Cifu, Chief Executive Officer, Virtu Financial, Inc.).

[184] Steve Quirk, Chief Brokerage Officer, Robinhood Mkts, Inc., Comment Letter to the SEC on the Order Competition Rule Proposal 18 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162975-332958.pdf [https://perma.cc/4X24-22T9] [hereinafter Robinhood's Comment Letter on the Order Competition Rule Proposal].

[185] Ernst et al., Would Order-by-Order Auctions Be Competitive?, *supra* note 120, at 4.

broader set of names may involve order flow volume guarantees from a retail broker to a wholesaler to compensate for additional risk.[186]

In other words, the phenomenon being described here is a form of cross-subsidization between more and less desirable names in a bundled set, which essentially constitutes a balance between trading obligations and privileges.[187] This cross-subsidization effectively precludes order-by-order competition and requires the existence of excess profits for certain names in the bundle in question. In part, this phenomenon of cross-subsidization might be caused by the consistency of executions provided by wholesalers:

> More broadly, wholesalers appear to provide retail brokers with a high degree of consistency with regard to execution quality. More specifically, while wholesalers receive order flow from retail brokers that contains variation in quoted spreads and adverse selection risk, wholesalers can target an average level of price improvement across this heterogeneous order flow, resulting in a relatively consistent degree of execution quality.[188]

---

[186] Paul Rowady, *SEC Proposing Auctions?! Let's Understand Liquidity Economics First*, ALPHACUTION (Aug. 31, 2022), https://alphacution.com/sec-proposing-auctions-lets-understand-liquidity-economics-first/ (registration required).

[187] A similar argument in defense of the current market structure system has also been advanced in the context of liquidity provision during periods of market stress: "For decades, exchanges have provided benefits to certain market participants in exchange for obligations to maintain an orderly market during market stress. . . . We would argue that the wholesaler arrangement provides even stronger incentives to protect investors than any specialist program ever has while being much less concentrated." Jason Clague, Managing Dir. & Head of Operations, The Charles Schwab Corp., Comment Letter to the SEC on the Market Structure Rule Proposals 14 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20162957-332913.pdf [https://perma.cc/WH8Y-X26D] [hereinafter Charles Schwab's Comment Letter on the Market Structure Rule Proposals].

[188] Order Competition Rule Proposal, *supra* note 2, at 186. Moreover, the existence and desirability of this consistency might be connected to the nature of order flow arrangements between wholesalers and retail brokers. *See, e.g.*, Robinhood's Comment Letter on the Order Competition Rule Proposal, *supra* note 184, at 18 ("Because wholesalers compete with each other and with exchanges, they are incentivized to invest in their relationships with broker-dealers by executing and providing favorable pricing to *all* of the retail broker-dealer's customer orders."); *SIFMA Equity Market Structure Roundtable, Part I*, *supra* note 139, at 2:22:14–:26 (remarks of Jeffrey Starr, Senior Vice President, Charles Schwab & Co.) (stating, from the perspective of a retail brokerage firm, that "retail clients

In fact, the concept of cross-subsidization in market making, particularly in the context of the historical NYSE specialist system, is well known, and it should be connected to the existence of externalities in providing liquidity as an argument in favor of such an arrangement, under certain parameters, in order to benefit the marketplace as a whole.[189] Accordingly, any relevant change to the current market structure might raise the issue of additional incentives for market makers in less liquid securities in a different form.[190]

The SEC did consider the possibility that "an additional cost for some orders may arise to the extent that lower execution quality for some orders currently subsidizes better execution

---

expect a consistent experience every time they send an order to us whether it's a highly liquid name or something outside of the top 100 or 200").

[189] For a discussion by the author of the concept of cross-subsidization between groups of securities with different characteristics and the concept of externalities in providing liquidity in conjunction with some balance of trading obligations and privileges of market makers, see Stanislav Dolgopolov, *Linking the Securities Market Structure and Capital Formation: Incentives for Market Makers?*, 16 U. PA. J. BUS. L. 1, 4–5, 28–30 (2013), https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1459&context=jbl [https://perma.cc/9MX3-BEYG] [hereinafter Dolgopolov, *Linking the Securities Market Structure and Capital Formation*]; Stanislav Dolgopolov, *Regulating Merchants of Liquidity: Market Making from Crowded Floors to High-Frequency Trading*, 18 U. PA. J. BUS. L. 651, 662–77 (2016), https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1514&context=jbl [https://perma.cc/ZWZ7-6BGC]. Interestingly, BLMIS had attacked the cross-subsidization argument in connection with exchange specialists in order to deflect the allegations of cherry picking by off-exchange market makers: "Primary markets claim that in order for them to make an efficient, liquid market in all securities, they must be protected from their competitors 'Cherry Picking' the most profitable business. If not, the end result will be that the primary markets will be forced to widen their spreads. [But] [t]here is no evidence to demonstrate the specialists' claim that order flow in a good security encourages them to improve the quality of their market in a less liquid security." Bernard L. Madoff & Peter B. Madoff, Bernard L. Madoff Inv. Sec., Comment Letter to the SEC on the U.S. Equity Market Structure Study 14 (Oct. 16, 1992) (on file with author). BLMIS also noted that it was "mak[ing] regular and continuous two-sided markets in over 400 of the most active listed securities; 200 NASDAQ securities, and several hundred convertible securities." *Id.* at 2.

[190] For a discussion by the author of various incentives for market makers in the context of such securities, see Dolgopolov, *Linking the Securities Market Structure and Capital Formation*, *supra* note 189.

quality for others,"[191] and this analysis was specifically extended to less liquid stocks in one of the proposed rules.[192] Importantly, while comparing wholesalers and securities exchanges, the SEC found empirical evidence showing that "differences in realized spreads are larger in stocks with lower liquidity," which was interpreted as an indication that "the isolation of individual investor orders due to wholesaler internalizations may result in larger losses in potential price improvement for individual investors on their orders in less liquid stocks,"[193] This observation provides a critical perspective on the existence of such cross-subsidization, and a further empirical inquiry is warranted in order to identify any evidence potentially proving or disproving that wholesalers effectively lose money, whether in terms of direct trading losses or broader opportunity costs, on a certain subset of less liquid stocks on a consistent basis. Importantly, one empirical study observed, consistently with the SEC's empirical analysis, that "the wholesaler realized spreads . . . may appear large relative the exchanges, particularly for the less liquid stocks," but it posed the question whether such "realized spreads [constitute] evidence of market power [or] compensat[e] for the inventory costs facing wholesalers in less liquid securities."[194] Ultimately, the evidence was interpreted as "suggest[ing] that realized spreads may be

[191] Order Competition Rule Proposal, *supra* note 2, at 215.

[192] *See* Regulation Best Execution Proposal, *supra* note 2, at 5534 ("In equities, the Commission preliminarily believes that firms that internalize retail order flow provide liquidity to a wide range of securities, including those that are very thinly traded. In fact, fulfillment of these more difficult to fill orders may be part of a service bundle that internalizers provide to broker-dealers that route them their order flow.").

[193] Order Competition Rule Proposal, *supra* note 2, at 194. Another relevant piece of empirical evidence identified by the SEC is as follows: "[W]hile about 57% of the shares in individual investor marketable orders in non-S&P500 stocks internalized by wholesalers received executions at less favorable prices than the NBBO midpoint, there was nevertheless hidden liquidity available at the NBBO midpoint for about 68% of these non-S&P500 shares." *Id.* at 210. For S&P500 stocks, the corresponding numbers were 48% and 72%, respectively. *Id.* at 211 tbl.20.

[194] Dyhrberg et al., *supra* note 100, at 24.

insufficient to cover inventory costs for less liquid stocks in the current environment and that wholesalers may cross-subsidize small stocks with their large-stock revenues."[195]

Moreover, as asserted by one commenter in support of enhancing order-by-order competition, the phenomenon of cross-subsidization may be multidimensional, generating additional distortions and leading to a smaller aggregate amount of price improvement:

> The Commission's proposal to, for the first time, mandate order by order competition for retail orders will substantially enhance the competition for retail orders, competing down PFOF and, in turn, provide greater aggregate price improvement to retail orders. . . . [U]nder the current non-competitive wholesale model, there is cross-subsidization of price improvement (and PFOF) across various categories of securities. For example, small retail orders are more profitable to trade with and can subsidize price improvement and PFOF for larger retail orders. Executions in securities with wider spreads can subsidize executions in securities with narrower spreads. And retail orders in large cap securities that are more actively traded can subsidize trading in small cap securities. As such, we would expect that for some securities subject to order by order competition, aggregate price improvement may decrease, while for other securities – in particular large cap securities, smaller retail orders, and securities with wider spreads – aggregate price improvement will increase, and that across all securities the total amount of price improvement will be greater than what is realized today. . . . This outcome highlights that the current non-competitive model distorts price discovery. Under the competitive model proposed by the Commission, these distortions will fall away, and each execution of a retail marketable order will reflect an accurate allocation of the economics of trading each given security, which in turn will enhance price discovery.[196]

---

[195] *Id.* at 31. As an example from foreign securities markets, a recent empirical study of the bundled allocation of more active "Tier A" stocks and less active "Tier B" stocks among designated market makers on the Toronto Stock Exchange found that "market making in Bs is only profitable in conjunction with a cross-subsidy from As," with "an improvement in liquidity for the less liquid stocks without creating a disruption in large stocks." Sean Foley, Cross-Subsidizing Liquidity 20–21 (rev. Jan. 5, 2023) (unpublished manuscript) (on file with author), https://www.wlu.ca/academics/faculties/lazaridis-school-of-business-and-economics/faculty-profiles/andriy-shkilko/cross-subsidization-of-liquidity.pdf [https://perma.cc/9FZ4-EQKG].

[196] Eric Swanson, Chief Exec. Officer, XTX Mkts. LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 3–4 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162530-331594.pdf [https://perma.cc/NYD2-S2BM].

While any immediate changes to price improvement in the aggregate would not necessarily reflect every benefit to the marketplace from cross-subsidization, for instance, in the context of more liquid and less liquid securities,[197] this argument provides an important perspective on potential disadvantages of the current market structure.

In summary, an inquiry into the competitive aspects of the current market structure, as well as its other benefits, relative to order-by-order competition amounts to a multifaceted issue that requires formal modeling, sophisticated data analysis, and, potentially, regulatory experimentation. While considerations of an alternative market structure aimed at fostering order-by-order competition may be seen as speculative, it would also be speculative, by the same token, to characterize the current market structure as the most appropriate one. Moreover, depending on the specifics of any given alternative market structure, one might see a disparate impact on several dimensions, such as small versus large orders, institutional versus retail investors, and less liquid versus more liquid securities.

III. The Proposed Regulatory Approach to Implementing Order-by-Order Competition

Among different approaches to implementing order-by-order competition, banning the business model of off-exchange market making, principally meaning undisplayed liquidity offered by wholesalers to segmented retail orders, would be the most radical step. Given the sheer impact of such a step, it is not very likely to be pursued by the regulators, although even several current beneficiaries of the current market structure had been in favor of such radical

[197] For the author's general discussion of additional economic gains in the form of capital formation from incentives to market makers, including examples of cross-subsidization between more liquid and less liquid securities, see Dolgopolov, *Linking the Securities Market Structure and Capital Formation*, *supra* note 189.

regulatory restrictions in the past. Take, for instance, the statement from 2004 by a leading retail brokerage firm, which recently routed *all* of its order flow in equities to wholesalers:

> [T]rue price transparency and discovery will not be achieved until the [SEC] requires internalized orders to be subject to public display and available for interaction prior to execution. Requiring firms that internalize order flow to publicly display those orders and to make them available for interaction with other orders prior to execution would increase transparency for all investors.[198]

Likewise, the parent company of today's leading off-exchange market maker had asserted back in 2004 that "the [SEC] ultimately should require all market participants to route their order flow to any one of the regulated securities exchanges or alternative trading systems."[199] It is also notable that the European regulators had considered and yet declined to adopt a de facto ban on the business model of "systematic internalisers" ("SIs"), which are analogous to off-exchange market makers under the U.S. regulatory regime.[200]

---

[198] Ellen L. S. Koplow, Esq., Exec. Vice President & Gen. Couns., Ameritrade, Inc., Comment Letter to the SEC on Regulation NMS Proposal 9 (June 30, 2004), https://www.sec.gov/rules/proposed/s71004/amer063004.pdf [https://perma.cc/V5SG-VPNU]. For recent disclosures of order routing practices of TD Ameritrade, Ameritrade's successor entity, see TD Ameritrade, Inc., Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2023 (July 20, 2023), https://www.tdameritrade.com/content/dam/tda/retail/marketing/en/pdf/cftc/tdainc-TDA2055-q2-2023.pdf [https://perma.cc/UYG2-F2TE]; TD Ameritrade Clearing, Inc, Held NMS Stocks and Options Order Routing Public Report, 2d Q., 2023 (July 20, 2023), https://www.tdameritrade.com/content/dam/tda/retail/marketing/en/pdf/cftc/tdac-TDA2054-q2-2023.pdf [https://perma.cc/9XGJ-KDL6].

[199] Citadel's Comment Letter on Regulation NMS Proposal, *supra* note 143, at 8.

[200] Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations*, *supra* note 15, at 483 & n.20. SIs appear to occupy a non-identical niche in the marketplace compared to their U.S. counterparts, judging by a relatively large average transaction size inconsistent with small retail transactions. For recent transaction size statistics for SIs, see LIQUIDNET HOLDINGS, INC., LIQUIDITY LANDSCAPE: Q3 2022, at 4 exh.6 (2022), https://static1.squarespace.com/static/5bedbc974eddecbfbb0c217e/t/63777e8d2f14471bcc42e0b9/1668775572974/EMEA+Liquidity+Landscape+Q3+2022.pdf [https://perma.cc/9BWQ-RTNM].

Accordingly, it is not surprising that the regulatory path proposed by the SEC in the form of retail auctions, while far-reaching, is more surgical than a ban.[201] With retail investors in mind, the regulatory agency described the proposed Order Competition Rule as "designed to benefit individual investors by promoting competition and transparency as means to enhance the opportunity for their orders to receive more favorable prices than they receive in the current market structure,"[202] but that measure was also aimed "to benefit investors generally by giving them an opportunity to interact directly with a large volume of individual investor orders that are mostly inaccessible to them in the current market structure."[203] The SEC asserted that "individual investor orders could continue to receive the benefits of segmentation (*i.e.*, better prices that reflect the low adverse selection costs of those orders), but without the negative effects of those orders being isolated from order-by-order competition."[204]

Overarchingly, the proposed Order Competition Rule "would require that certain orders of individual investors be exposed to competition in fair and open auctions, before such orders

---

[201] The author was among the commentors who had previously suggested to the SEC the approach analogous to price improvement auctions in options markets. *See* Haim Bodek, Managing Principal, & Stanislav Dolgopolov, Chief Regulatory Officer, Decimus Capital Mkts., LLC, Comment Letter to the SEC on the Equity Market Structure Advisory Committee 11–12 (Apr. 25, 2016), https://www.sec.gov/comments/265-29/26529-63.pdf [https://perma.cc/ZKK9-VUUV] ("[T]he Committee should review on-exchange internalization practices in the equity options space, such as price improvement auctions, as a way to implement analogous mechanisms in equity markets for internalized order flow that currently is not subjected to competitive forces on an order-by-order basis. More specifically, we recommend a rule that would require exposure of internalized order flow to competitive price improvement, for instance, through an exchange auction facility, for orders not meeting a minimum threshold price improvement requirement.").

[202] Order Competition Rule Proposal, *supra* note 2, at 129.

[203] *Id.*

[204] *Id.* at 130.

could be executed internally by trading centers that restrict order-by-order competition."[205] Such auctions would be conducted by "open competition trading centers" comprised of certain qualified securities exchanges and ATSs,[206] although the SEC concluded "that few ATSs would operate qualified auctions, either because it would be difficult for new ATSs to meet the requirements to run qualified auctions or because the requirements of operating a qualified auction would be incompatible with the business models of most currently operating ATSs."[207] In turn, the definition of "restricted competition trading center" would mean "any trading center that is neither an open competition trading center nor a national securities exchange."[208] The regulatory agency observed that, "[c]urrently, no NMS Stock ATS displays quotations in the ADF [Alternative Display Facility] [and thereby would not] meet the proposed definition of an open competition trading center."[209] Likewise, "[t]he three other types of broker-dealer trading centers[,] exchange market makers, OTC market makers (including wholesalers), and internalizing broker-dealers" would not comply with the proposed definition "[u]nless such a broker-dealer became an NMS Stock ATS and met all of the [required] elements."[210] While the coverage of the proposed Order Competition Rule would not be confined to wholesalers, its

---

[205] *Id.* at 129. The proposal also provided the following definition: "'Order-by-order' competition in this context means an opportunity to compete to trade with individual investor orders by offering the most favorable price for each order based on the particular characteristics of the order, including the nature of the NMS stock, the size of the order, and market conditions at the time the order is submitted." *Id.* at 129 n.1.

[206] *Id.* at 151–55.

[207] *Id.* at 219.

[208] *Id.* at 155.

[209] *Id.*

[210] *Id.*

impact would be critical for these market participants, as well as retail brokerage firms that have order flow arrangements with them, given their respective business models.[211]

Another key feature of the proposal is illustrated by the exceptions to the requirements of routing orders to retail auctions. The exceptions cover (1) "a segmented order that is received and executed by a restricted competition trading center during a time period when no open competition trading center is operating a qualified auction," (2) "large orders with a market value of at least $200,000 [which] is designed to address the heightened liquidity need of large orders that often may be more appropriately addressed outside of a qualified auction," (3) "segmented orders that are executed by a restricted competition trading center at a price that is equal to the NBBO midpoint or more favorable [as] an investor would either be paying no spread . . . or earning a spread," (4) "segmented orders that are limit orders with a limit price . . . equal to or more favorable . . . than the midpoint of the [NBBO] [which] is designed so that . . . a qualified auction would not be necessary to obtain a competitive price," and (5) "the fractional share component of a segmented order."[212] Notably, there is no "exception for orders directed by a customer to a particular restricted competition trading center for execution [although] customers could continue to direct segmented orders to any trading center that was not a restricted competition trading center."[213] Likewise, "[b]roker-dealers would always have the option to

---

[211] *See, e.g., id.* at 203 (noting "the current industry practice [of retail brokerage firms] of routing nearly all retail order flow to wholesalers").

[212] *Id.* at 155–56. Notably, the midpoint exception has been criticized on the grounds that "[t]he midpoint does not reflect an unbreachable theoretical limit on competition for retail orders [in part because] institutional investors and market makers have different tolerances for realized spreads." Stephen W. Hall, Legal Dir. & Sec. Specialist, and Houston Shaner, Senior Couns., Better Mkts., Inc., Comment Letter to the SEC on the Order Competition Rule Proposal 24 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20163089-333076.pdf [https://perma.cc/26R3-GN43].

[213] Order Competition Rule Proposal, *supra* note 2, at 156–57. The SEC also observed that, "[c]urrently, 98% of the marketable orders of individual investors routed to wholesalers are not directed to any particular trading center, with

direct their orders to open competition trading centers or national securities exchanges instead of qualified auctions."[214] This scope of exceptions once again emphasizes the mandatory nature of retail auctions, which could otherwise be undone by customer-facing brokers routing orders to wholesalers based on a disclaimer or a customer consent document. This regulatory approach should be contrasted to the existing auctions for marketable orders in the equities space offered by some trading venues as a mere option.[215]

Messages about retail orders would "be provided for dissemination in consolidated market data . . . including disclosure that the auction is for a segmented order, the identity of the open competition trading center, NMS stock symbol, side (buy or sell), size, limit price, and identity of the originating broker."[216] With respect to the last element, the SEC emphasized that "the identity of the originating broker likely would convey additional information concerning the level of adverse selection costs that an auction responder could expect."[217] In other words, instead of a binary retail / non-retail flag, this approach to on-exchange segmentation is aiming

---

the investor instead relying on their broker-dealer, and their broker-dealer's best execution responsibilities, for order routing." *Id.* at 156.

[214] *Id.* at 217 n.597; *see also id.* at 148 ("There may be market conditions when a best execution analysis could indicate that a broker-dealer should route segmented orders directly to the continuous order book of an open competition trading center or national securities exchange.").

[215] *See, e.g.*, CODA Mkts., Inc. [CODA ATS], Updating Amendment to Form ATS-N (Form ATS-N/UA) Item 11(a) (Oct. 12, 2022), https://www.sec.gov/Archives/edgar/data/921107/000092110722000027/0000921107-22-000027-index.htm ("Only Liquidity Seeker orders deemed 'marketable' upon receipt can initiate auctions."). Not surprisingly, CODA's parent entity welcomed Chair Gensler's speech and "the SEC's efforts to effect such modernization in a manner which allows brokers and wholesalers to compete for the orders of retail and institutional traders—to the benefit of both." *Apex Comments on SEC Chair's Vision*, APEX FINTECH SOLUTIONS (June 8, 2022), https://apexfintechsolutions.com/resource/apex-comments-on-sec-chair-vision/ [https://perma.cc/6BDZ-5K6X].

[216] Order Competition Rule Proposal, *supra* note 2, at 157.

[217] *Id.* at 158.

for more granularity based on the identity of the customer-facing brokerage firm in question, which would replicate off-exchange segmentation. However, the originating broker in question

> could either allow its identity to be disclosed in an auction message or it could withhold this information by certifying that it has established, maintained, and enforced written policies and procedures reasonably designed to assure that its identity will not be disclosed, directly or indirectly, to any person that potentially could participate in the qualified auction or otherwise trade with the segmented order.[218]

Furthermore, "the time period for a qualified auction must be no shorter than 100 milliseconds (1/10th of a second) and no longer than 300 milliseconds (3/10ths of a second) after an auction message is provided for dissemination in consolidated market data."[219] The SEC articulated that "[t]he intent of these limits is to help ensure that a wide variety of market participants will have the technological capacity to submit responses to fast automated auctions, while also helping to assure that the execution of segmented orders is not unduly delayed."[220] The regulatory agency also pointed out that "securities exchanges operate auctions that fall within these time periods, which indicates that the time periods are workable with technologies that currently are available to market participants," citing examples from both the equities and options segments.[221] The SEC further stated that the proposed timeframe was "designed to

---

[218] *Id.*

[219] *Id.*

[220] *Id.*

[221] *Id.* at 158 & n.243. A typical price improvement auction in the options space has been described as "last[ing] no longer than 100 milliseconds." OPTIVER, IMPROVING THE PRICE IMPROVEMENT MODEL 1 (Aug. 2021), https://www.optiver.com/wp-content/uploads/2021/08/Equity-Option-PIMs-Paper.pdf [https://perma.cc/YL65-HM8G] [hereinafter OPTIVER, IMPROVING THE PRICE IMPROVEMENT MODEL]. Some price improvement auctions in the options space may have a longer duration. *See, e.g.*, NYSE AMERICAN OPTIONS, INTERCONTINENTAL EXCH., INC., CUBE OFFERS ELECTRONIC PRICE IMPROVEMENT FOR SINGLE-LEG AND COMPLEX PAIRED ORDERS 1 (2018), https://www.nyse.com/publicdocs/nyse/markets/american-options/CUBE_FS.pdf [https://perma.cc/S872-XHNN] (stating that "[t]he auction will end after a random duration between 500 and 750 milliseconds, unless an event causes an early conclusion to the auction").

promote competition to obtain the best prices for segmented orders, but without a delay long enough to be inconsistent with an investor's intent to trade immediately at the best available prices."[222] While it is important to recognize the nature of such auctions as a de facto speed bump with potentially changing market conditions and fluctuating prices in the background,[223] they need to be compared to the existing practices in wholesaling from the standpoint of immediacy. The SEC's empirical analysis calculated the median execution time metrics for internalized and rerouted orders handled by wholesalers at 3.6 and 24 milliseconds, respectively,[224] making them considerably shorter than the *shortest* possible auction under the proposal.[225]

---

[222] Order Competition Rule Proposal, *supra* note 2, at 158.

[223] As a historical analogy from an era of very different technological capabilities in securities markets, the proposed 30-second window for price improvement exposure was seen as alternatively insufficient and too long by different commenters. *Compare* Thomas F. Ryan, Jr., President & Chief Operating Officer, Am. Stock Exch., Inc., Comment Letter to the SEC on the Order Execution Obligations Rule Proposals 23 (Feb. 1, 1996) (on file with author) ("[A] 30 second exposure time would be insufficient in most cases for the specialist to identify the superior bid or offer and to permit receipt of a commitment to trade by the exposing market prior to expiration of the exposure period."), *with* Paul A. Merolla, Vice President & Assoc. Gen. Couns., Goldman, Sachs & Co., Comment Letter to the SEC on the Order Execution Obligations Rule Proposals 3 (Jan. 26, 1996) (on file with author) ("[W]e think that price improvement rule is too mechanical [and that] the proposed 'safe harbor' is too impractical in fast-moving, volatile markets."). Turning to the current proposal, one technical criticism is that it "fails to consider what should occur if there is a change in the NBBO during the duration of a qualified auction and how qualified auctions would accord with the Order Protection Rule." Ellen Greene, Managing Dir., Equity & Options Mkt. Structure, Sec. Indus. & Fin. Mkts. Ass'n, Comment Letter to the SEC on the Market Structure Rule Proposals 70 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20163541-333880.pdf [https://perma.cc/G7PV-5WVU] [hereinafter SIFMA's Comment Letter on the Market Structure Rule Proposals].

[224] Order Competition Rule Proposal, *supra* note 2, at 196. Interestingly, a recent empirical study found that orders going through wholesalers that involve PFOF are generally executed much slower relative to direct orders: "Consistent with the notion that PFOF leads to slower execution . . . buy (sell) orders take 442.02 ms [milliseconds] (459.20 ms) to execute on average, an increase of 361.50 ms (396.36 ms) over direct orders." Levy, *supra* note 132, at 17. In other words, this study suggests that the execution time differential in the equities space is materially longer than the *maximum* duration of the proposed auctions and hence would not compromise execution time metrics

Moreover, "auction responses [would] remain undisplayed during the time frame of the auction and not be disseminated thereafter," which was aimed "to prevent the market participants with the fastest systems from obtaining an advantage by observing the pricing of auction responses and submitting their auction responses near the end of the time period for the auction" and "to prevent information leakage, both during auctions themselves and by analyzing historical auction data, concerning the trading interest of market participants, particularly institutional investors, that submit auction responses."[226] Another key feature deals with the framework of priorities for auction responses. The two affirmative requirements would be, first, price priority to "maximize[] competitive incentives to obtain the best prices for segmented orders" and, second, customer priority to allow "the segmented order of an investor [to] interact directly with

---

relative to the existing practices of wholesalers. Yet, overarchingly, this conclusion is contradicted by the SEC's more comprehensive empirical analysis.

[225] In fact, several commenters have maintained that the proposed time frame would be too long. *See., e.g.*, BestEx's Comment Letter on the Order Competition Rule Proposal, *supra* note 135, at 5 ("300 milliseconds is too long a duration for auctions. We believe that 100 milliseconds is sufficient for most algorithmic trading firms to respond. The longer the auction duration, the higher the likelihood that quotes on exchanges may fade, limiting the intended benefit of these auctions for all investors."); Hope M. Jarkowski, Gen. Couns., NYSE Grp., Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 9–10 (Mar. 13, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20159564-327572.pdf [https://perma.cc/7NXJ-48V3] [hereinafter NYSE's Comment Letter on the Market Structure Rule Proposals] ("The Commission's proposed 100 millisecond minimum auction length is too long by today's market standards and would present opportunities for arbitrage that could lead to the NBBO moving while the auction is in progress, to the disadvantage of the retail orders that the proposal is meant to benefit."); Lawrence Harris, Professor of Fin. & Bus. Econ., Marshall Sch. of Bus., Univ. of So. Cal., Comment Letter to the SEC on the Order Competition Rule Proposal 5 (May 23, 2023), https://www.sec.gov/comments/s7-31-22/s73122-193419-384282.pdf [https://perma.cc/47QU-H6QR] [hereinafter Professor Harris's Comment Letter on the Order Competition Rule Proposal] ("The necessary time for these functions depends on whether the SEC expects all participants to collocate their servers with the auction service providers' servers. In this case, the auction period need only be about 1-10 milliseconds. . . . Alternatively, the SEC may want the auctions to be available to all participants regardless of where in the U.S. they put their servers. If the latter, time must be allowed for communications where the speed of light becomes a significant issue. This will require 50-100 milliseconds.").

[226] Order Competition Rule Proposal, *supra* note 2, at 158–59.

the auction response of another investor without the participation of a dealer."[227] Furthermore, the negative requirements consist of "the prohibition of time priority . . . [to] eliminate[] the incentive for a speed race that otherwise could reward market participants with resources to spend the most on sophisticated, low-latency trading systems and connectivity" and "[the] prohibition against favoring the broker-dealer that routed the segmented order to the auction, the originating broker for the segmented order, the open competition trading center operating the auction, or any affiliate of the foregoing persons . . . to help maintain a level playing field among market participants submitting auction responses and thereby focus competition in the auctions on providing the best prices for segmented orders."[228] A related requirement

> would prohibit a broker-dealer with knowledge of where a segmented order is to be routed from submitting an order, or enabling an order to be submitted by any other person, to the continuous order book of an open competition trading center or of a national securities exchange that could have priority to trade with the segmented order at such open competition trading center or national securities exchange.[229]

Importantly, the prohibition against favoring broker-dealers is connected to the experiences of retail auctions in the options space, which, by contrast, does not have off-exchange trading of listed options.[230] Accordingly, any alternative implementation of auctions in the equities space

---

[227] *Id.* at 160.

[228] *Id.* at 160–161.

[229] *Id.* at 163.

[230] One critical viewpoint is that such auctions in the options space "are overly complicated and give outsized benefits to wholesalers with an affiliated market maker [and they] impede maximum price improvement and essentially act as an internalization mechanism for wholesalers with an affiliated MM [market maker] arm," given such features as guaranteed partial allocations of order flow, the auto-matching feature, and asymmetric fee schedules that could differ by a factor of ten. OPTIVER, IMPROVING THE PRICE IMPROVEMENT MODEL, *supra* note 221, at 1–2. *See also* OPTIVER, THE PFOF YOU DIDN'T KNOW EXISTED: EXCHANGE MARKETING & RESPONSE FEES 2–3 (Aug. 2021), https://www.optiver.com/wp-content/uploads/2021/08/Equity-Option-Asymmetric-Fees-Paper.pdf [https://perma.cc/JJM7-7DCJ] ("This asymmetric fee schedule acts as a barrier to competition as it directly rewards those affiliated MMs who enjoy a cost advantage over their unaffiliated competitors. . . . At best these cost features

must grapple with evaluating advantages for certain market participants, including wholesalers that would route order flow to an auction facility as executing brokers.[231]

The final priority principle would mandate auction responses "to be integrated with the continuous order book of an open competition trading center [in order] to balance the objectives of obtaining the best prices for segmented orders and maintaining fair competition both in qualified auctions and on continuous order books."[232] More specifically, to reinforce the

---

create a skewed playing field across MMs and, at worst, could result in wider spreads for retail investors."); Thomas Ernst & Chester Spatt, Payment for Order Flow and Asset Choice 50 (rev. Feb. 21, 2023) (unpublished manuscript) (on file with author), https://joim.com/wp-content/uploads/emember/downloads/ernst_paper.pdf [https://perma.cc/3PSS-533T] (stating that "option markets do not have off-exchange internalization [but use] exchange-provided methods for internalizing trades" and presenting empirical evidence to conclude that "the large discount given in the PIM [price improvement mechanism] auction says more about the wideness of the quotes than the competitiveness of the auction"). The ultimate charge is that "an on-exchange auction process doesn't necessarily guarantee order-by-order competition." Michael Golding, Optiver, *The SEC Is Tackling the Equity Market. Here Are Some Lessons From the Options Market*, LINKEDIN (June 21, 2022), https://www.linkedin.com/pulse/sec-tackling-equity-market-here-some-lessons-from-options-golding/ [https://perma.cc/SSH6-BZFQ]. Accordingly, some criticism of the proposed Order Competition Rule based on the experiences of the options space seems to be circular in light of the advantages enjoyed by wholesalers. *See, e.g.*, Stephen John Berger, Managing Dir., Glob. Head of Gov't & Regul. Pol'y, Citadel Sec. LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 20 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20164211-334052.pdf [https://perma.cc/HEA9-9T4J] [hereinafter Citadel Securities' Comment Letter on the Order Competition Rule Proposal] ("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.").

[231] *See* Svetlana Bryzgalova et al., *Retail Trading in Options and the Rise of the Big Three Wholesalers*, 78 J. FIN. 3465, 3475 n.16 (2023), https://onlinelibrary.wiley.com/doi/pdf/10.1111/jofi.13285 ("To some extent, [the advantages given to wholesalers in price improvement auctions in the options space are] natural, since markets benefit from the presence of largely uninformed retail flow and wholesalers are therefore compensated for delivering these orders. However, the structure and size of the fees associated with servicing retail order flow that would lead to the optimal level of competition among market makers and efficient order execution remains an open question.").

[232] Order Competition Rule Proposal, *supra* note 2, at 161.

principle of price priority, "orders resting on the continuous order book of the open competition trading center operating the qualified auction, whether displayed or undisplayed, would have priority over auction responses at a less favorable price for the segmented order."[233] Furthermore, with "the purpose of promoting public price transparency," "displayed orders resting on the continuous order book would be required to have priority at the same price over auction responses, while, in turn, auction responses would be required to have priority at the same price over undisplayed orders resting on the continuous order book."[234] Finally, the SEC stated that "open competition trading centers also would have flexibility to develop additional execution priority rules for their auction mechanism," for instance, in the context of "multiple best priced responses."[235]

Even this abridged description of the basic features of the proposed Order Competition Rule, which omits many details, gives a sense of its complexity and the corresponding multitude

---

[233] *Id.*

[234] *Id.*

[235] *Id.* One pivotal problem connected to the framework of priority rules and additional design flexibility involves coordination and potential interaction of auctions on the same trading venue or across different trading venues. *See, e.g.,* BestEx's Comment Letter on the Order Competition Rule Proposal, *supra* note 135, at 5 ("We . . . suggest that exchanges run continuous batch auctions rather than event-based auctions. For example, if Exchange A runs a batch auction every 50 milliseconds, all retail orders arriving at Exchange A within those 50 milliseconds would be grouped. . . . This kind of an auction mechanism, along with the retail price improvement orders from other market participants, would minimize the number of cancellations liquidity providers have to do (e.g., canceling an order posted on a different exchange that did not receive the retail order). Smaller auction sizes, longer duration and no guarantee of fill could drive a decision not to participate in retail auctions for some algorithm providers."); Ari Rubenstein, Chief Exec. Officer, GTS Sec., LLC, Comment Letter to the SEC on the Market Structure Rule Proposals 7–8 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20163336-333822.pdf [https://perma.cc/NSU5-4C3F] ("[T]he operational complexities such auctions would entail are hard to overstate and even more difficult to fully comprehend. For example, the Order Competition Proposal could result in multiple auctions running simultaneously in the same name on the same venue or across different venues with different operational configurations.").

of mandatory elements. Importantly, the regulators have preferred an egalitarian approach to auctions, specifically declining to introduce "designated liquidity providers" with a balance of trading obligations and privileges on the grounds that this mechanism "may reduce the incentive for other market participants to compete to supply liquidity to segmented orders," although "this alternative would provide more certainty regarding individual investor orders executing in qualified auctions, particularly in less liquid securities where there may be a higher chance that no liquidity suppliers bid in the auctions."[236] While not specifically discussed by the SEC as such, the proposed path could also be seen as a culmination of the regulators' earlier deliberations on the need for a mandatory mechanism of exposing order flow for price improvement for a specified time period with the goal of enhancing interaction of various types of liquidity and improving execution quality. This time, the proposed Order Competition Rule would be set in the modern electronic marketplace with its technological advances that allow for a truly marketwide dissemination of trading interests, while also aiming to replicate certain features of off-exchange segmentation. The maximum duration of the proposed auctions would be exactly one hundredth of the 30-second order exposure period contemplated by the regulators not that long ago,[237] but this mechanism is still a speed bump for continuous markets with corresponding implications for the interaction of different auctions across or within trading venues. Furthermore, the very feature of retail order flow exposure is a regulatory constraint on the business model of off-exchange market making, and, in addition to the expectation that "the gains to individual and institutional investors would be an economic transfer from the

[236] Order Competition Rule Proposal, *supra* note 2, at 234. As yet another illustration, the proposal would also "prohibit any volume discount that could give the largest participants an economic advantage in pricing their auction responses compared to other market participants" as a measure "to promote a level playing field among all potential market participants that may wish to trade with segmented orders." *Id.* at 160.

[237] For a description of the order exposure safe harbor proposed in 1995, see *supra* note 64 and accompanying text.

wholesaler[s],"[238] the regulatory agency perceived this approach as an indirect constraint on certain other practices of wholesalers, such as PFOF.[239] Overarchingly, the SEC explicitly expected that its approach would reduce profits of wholesalers and disrupt the existing order flow relationships: "The predicted decline in wholesaler profit margins from internalization might force wholesalers to reduce or cease paying PFOF, which in turn, would remove a key incentive for some broker-dealers to route to wholesalers."[240] On the other hand, the regulators expected a more intense form of competition rather than a displacement of this type of market participants, stating that the proposal "would likely pressure wholesalers to provide greater price improvement in order to remain competitive in providing liquidity to segmented orders" and even noting the possibility that "wholesalers could have a competitive advantages in supplying liquidity in these auctions due to their economies of scale and market making expertise."[241] The regulatory agency also considered the scenario of the reemergence of brokerage commissions, another key cost for retail investors, which necessitates an analysis of its magnitude:

[238] Order Competition Rule Proposal, *supra* note 2, at 212 n.544.

[239] For instance, the SEC had expressed the view that, "in order for a wholesaler to effectively compete against other bidders in qualified auctions, the wholesaler would have to reduce the PFOF it is paying to the retail broker in order to bid more aggressively to potentially win the qualified auction [which] would result in the reduction in PFOF instead going to the customer as additional price improvement." *Id.* at 206 n.514. Moreover, any direct form of regulation on PFOF would raise the issue of the difficulty of monitoring non-monetary compensation, as well as a potential migration to such form of compensation as an industry response. As the regulatory agency asserted decades ago, "If the practice of cash payment for order flow were banned, because it is only one of many forms of inducement for order flow, the Commission has every reason to believe that an attendant increase in related 'soft' inducements for order flow or internalization of order flow would follow. Moreover, it would be impractical to attempt to ban solely soft practices (everything except monetary payment for order flow); such practices are difficult to monitor and industry participants would find alternative avenues for accomplishing the same result." Payment for Order Flow, Exchange Act Release No. 34,902, 59 Fed. Reg. 55,006, 55,011 (Oct. 27, 1994) (codified at 17 C.F.R. pt. 240), https://www.govinfo.gov/content/pkg/FR-1994-11-02/pdf/FR-1994-11-02.pdf (footnote omitted).

[240] Order Competition Rule Proposal, *supra* note 2, at 297.

[241] *Id.* at 217.

> Some retail brokers could also experience costs from wholesalers reducing the amount of PFOF they pay to retail brokers or from reducing or charging for the order handling services they offer to retail brokers. Some of these costs could ultimately be passed on to individual investors, such as through the resumption of commissions for NMS stock trades being charged by some retail brokers.[242]

While the SEC was "unable to quantify the risk that some discount brokers would resume charging commissions on NMS stock and ETF [exchange-traded fund] trades," it noted "a number of factors that might make this risk low,"[243] including the following observation:

> [T]he majority of retail brokers receive relatively little or no PFOF, and yet they have nevertheless successfully managed to support commission-free trading through their other revenue-generating lines of business. . . . Moreover, the average PFOF payment that brokers receive on a 100 share order is 10-20 cents. The PFOF for a 1000 share order is less than the commission fees previously charged by broker-dealers, which had generally been $5 or more. Thus, just as the loss of commission fees was not offset by the receipt of PFOF, the loss of PFOF might not necessitate the return of commission fees.[244]

Unsurprisingly, the proposed Order Competition Rule has resulted in a barrage of criticism, often coming from key stakeholders, including not just wholesalers and retail brokerage firms, but also several securities exchanges and institutional investors that presumably had been intended to realize some benefits from this regulatory change.[245] The sheer volume of

---

[242] *Id.* at 203–04.

[243] *Id.* at 218–19.

[244] *Id.* at 216 (footnotes omitted). However, the SEC's analysis of this issue has been criticized. *See, e.g.*, Robinhood's Comment Letter on the Order Competition Rule Proposal, *supra* note 184, at 67 ("The SEC's lack of rigor and almost flippant approach to the real risk of returning commissions and declining retail investor participation in the marketplace is concerning. If commissions increase or return, there is minimal, if any, value in proposals that, at best, might marginally and hypothetically increase price improvement for some orders.").

[245] For notable comment letters criticizing the proposed Order Competition Rule submitted jointly by key players from different constituencies, see David Howson, Exec. Vice President & Glob. President, Cboe Glob. Mkts., Inc., Nathaniel N. Evarts, Managing Dir. & Head of Trading, Ams., State St. Glob. Advisers, Inc., Kimberly Russell, Mkt. Structure Specialist, Glob. SPDR Bus., State St. Glob. Advisers, Inc., Mehmet Kinak, Glob. Head of Equity Trading, T. Rowe Price Grp., Inc., Todd Lopez, Ams. Head of Execution Servs., UBS Sec. LLC & Douglas A. Cifu, Chief Exec. Officer, Virtu Fin., Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 3 (Mar. 24, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20161714-330556.pdf [https://perma.cc/BJA6-XRSF];

criticism is too extensive to be summarized here, but several arguments aimed at the proposal as a whole or its key features maintain that (i) the level of complexity and the implementation costs would be excessive;[246] (ii) the proposal would have an anticompetitive impact;[247] (iii) institutional investors would not have sufficient interest in participating in auctions;[248] (iv) the

---

Michael Blaugrund, Chief Operating Officer, NYSE Grp., Inc., Jason Clague, Managing Dir. & Head of Operations, Charles Schwab & Co. & Joseph Mecane, Head of Execution Servs., Citadel Sec. LLC, Comment Letter to the SEC on the Market Structure Rule Proposals 2 (Mar. 6, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20158677-326603.pdf [https://perma.cc/U2TP-5QLM] [hereinafter Joint Comment Letter by NYSE, Charles Schwab & Citadel Securities to the SEC on the Market Structure Rule Proposals].

[246] *See, e.g.*, Michael Camacho, Chief Exec. Officer, Wealth Mgmt. Solutions & George C.W. Gatch, J.P. Morgan Asset Mgmt., JPMorgan Chase & Co., Comment Letter to the SEC on the Market Structure Rule Proposals 15 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20162921-332824.pdf [https://perma.cc/Z2FU-P2TB] ("[W]e do not believe the Commission has accurately assessed the scale and complexity of the infrastructure that would be required to implement the Order Competition Rule. If the rule is adopted, market participants would need to design, build, and test an expansive and complicated technology framework."); Two Sigma Securities' Comment Letter on the Order Competition Rule Proposal, *supra* note 179, at 9 ("The Commission's plan is not supported by sufficient analysis regarding the burdens it places on market participants and underweights those burdens, including the complexity and the costs of implementation, which ultimately will have to be borne by retail investors.").

[247] *See, e.g.*, Virtu Financial's Comment Letter on the Order Competition Rule Proposal, *supra* note 138, at 24 ("Mandating that all orders not executed at midpoint or better have to be routed to one of a handful of exchanges that have essentially identical auction structures undermines the competition across different types of market centers, as explicitly envisioned by Congress, and destroys the incentive to innovate or for individual market makers to attract future order flow by providing more price improvement. And although the Commission has expressed concern about market concentration among wholesalers, the Commission inexplicably seeks to resolve this purported problem by funneling retail orders into an extremely concentrated market, where just three exchanges account for the vast majority of NMS stock volume." (footnote omitted)).

[248] *See, e.g.*, Jeffrey P. Mahoney, Gen. Couns., Council of Inst. Invs., Comment Letter to the SEC on the Market Structure Rule Proposals 8 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162681-331929.pdf [https://perma.cc/UG8Z-27M8] ("[F]or many institutional investors, the risk of potentially revealing their identities and trade interest to even a single dealer by participating in the proposed new auction mechanisms could materially outweigh any potential benefits of receiving the executions." (footnote omitted)); Derrick Chan, Head of Equities, Fid. Capital Mkts., Fid. Invs. LLC, Comment Letter to the SEC on the Market Structure Rule Proposals 22–23 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20163322-333788.pdf [https://perma.cc/LM4D-7MR3] [hereinafter Fidelity's Comment Letter on the Market Structure Rule Proposals] ("We are concerned that Qualified

mechanics of auctions would cause information leakage and trading ahead;[249] (v) less actively traded securities could be adversely impacted by the proposal;[250] (vi) the proposal would be too

---

Auction participants will fade their quotes or cancel their bid/offer and front-run auction trading prior to the segmented order being filled on the Qualified Auction. As a potential auction participant, we would be competing against this behavior. Auctions may also preference institutions that have strong technology and a short trading horizon/strategy as the signal-to-noise ratio improves and could lead to greater information leakage risks on larger blocks. We question how many traditional institutional investors – including mutual funds, pension funds, and other institutions who invest on behalf of millions of Americans will be able to participate in Qualified Auctions."); Jennifer W. Han, Exec. Vice President, Chief Couns. & Head of Glob. Regul. Affairs, Managed Funds Ass'n, Comment Letter to the SEC on the Market Structure Rule Proposals 17 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162531-331597.pdf [https://perma.cc/9V53-K8AD] ("[W]e question whether institutional investors could, without undue cost, participate in covered auctions. At a minimum, to do so, they would need to configure their order routing and execution algorithms to react extremely quickly to auction messages, and more generally take into account the added market complexity associated with mandatory covered auctions. It would involve a major business decision to undertake such a significant operational and technological build and necessitate hiring additional personnel. The majority of our members engage in fundamental research and are not likely to be interested in expanding their business to engage in covered auctions, particularly given the extremely short timeframe to react to auction messages. They also would need to consider potential information leakage concerns associated with their orders executing within a covered auction."); *see also* Citadel Securities' Comment Letter on the Order Competition Rule Proposal, *supra* note 230, at 20 ("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.").

[249] *See, e.g.*, Citadel Securities' Comment Letter on the Order Competition Rule Proposal, *supra* note 230, at 17 ("[A]ll 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 . . . . 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).").

[250] *See, e.g.*, Nathaniel N. Evarts, Managing Dir., Head of Trading, Ams. & Kimberly Russell, Mkt. Structure Specialist, Glob. SPDR Bus., State St. Glob. Advisors, Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 5 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162728-332114.pdf

rigid and discourage further experimentation and differentiation;[251] and (vii) the proposal ignores the impact of other pending and proposed regulatory measures or conflicts with its companion proposals.[252] From the standpoint of the empirical analysis offered by the regulators, notable critical arguments maintain that (i) the SEC's analysis understated the cost of failed auctions caused by the exposure of retail orders during the 100-300 millisecond timeframe,[253] (ii) the

---

[https://perma.cc/LRP6-C4EA] [hereinafter State Street's Comment Letter on the Market Structure Rule Proposals] ("For retail investors, the execution quality they receive could deteriorate in less actively traded securities in the event that liquidity providers opt not to support all securities in the auctions. This could result in more liquidity gaps, volatility halts, and poor execution outcomes. We also worry that directing orders into these auctions without addressing exchange limits on liability exposes retail investors to unnecessary risks."); JJ Kinahan, President, tastytrade, Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 13 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162483-331539.pdf [https://perma.cc/N3QD-8QKK] [hereinafter Tastytrade's Comment Letter on the Market Structure Rule Proposals] ("An order-by-order auction removes incentives on market makers to execute trades in less liquid underlyings. . . . The assumed negligible gains in more liquid names will be more than offset by what we see as losses in less liquid names as well as those that are currently less liquid, suffering an even bigger loss of potential liquidity.").

[251] *See, e.g.*, Adrian Griffiths, Head of Mkt. Structure, MEMX LLC, Comment Letter to the SEC on the Market Structure Rule Proposals 33 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20163328-333796.pdf [https://perma.cc/B2Q3-S7H7] [hereinafter MEMX's Comment Letter on the Market Structure Rule Proposals] ("MEMX is also concerned that the proposal would negate the ability of market centers to innovate by hard-coding an inflexible design into the proposed regulatory structure without a full and fair assessment of: (1) whether a superior design may be available now or may become available in the future; (2) whether the U.S. equity market would be better served by allowing venues to differentiate their product offerings; and (3) the impact on competition if all qualified auctions are homogenous as a matter of regulatory design, including heightened risks of concentration in one or more venues, contrary to the Commission's goal of increasing competition.").

[252] *See, e.g.*, Robinhood's Comment Letter on the Order Competition Rule Proposal, *supra* note 184, at 39 ("[The proposal] does not take into account the economic effect of the pending MDI [Market Data Infrastructure] Rules or the contemporaneous Proposed Rule 605 and Tick Size Proposal, the combined effects of which may very well obviate any basis for the Proposed OCR [Order Competition Rule]."); SIFMA's Comment Letter on the Market Structure Rule Proposals, *supra* note 223, at 13 ("Proposed Reg Best Ex and the OCR have significant overlap and potentially inconsistent mandates that the Commission has not addressed.").

[253] *See, e.g.*, Robert Battalio, Professor of Fin., Mendoza Coll. of Bus., Univ. of Notre Dame, Comment Letter to the SEC on the Order Competition Rule Proposal 1 (Mar. 28, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20161906-330732.pdf [https://perma.cc/ZK2H-ZZE9] ("[W]e employ what we believe to be superior data and

SEC's focus on realized spreads is misguided,[254] and (iii) the SEC's analysis of available midpoint liquidity is inaccurate.[255] While these strands of criticism are likely to lead to further debates of the merits of the proposed regulatory approach to order-by-order competition, the very resistance shown by several key constituencies of the securities industry raises doubts about the ultimate adoption of the proposal in its current form and points to potential alternatives.

---

methodologies than those used by the Commission in their 'fade analysis' to estimate the potential costs imposed by failures in the proposed auctions (e.g., auctions that fail to produce an execution) on retail execution quality. . . . In reasonable scenarios, we find that the annualized potential costs of failed auctions greatly exceed $2 billion, which is greater than the Commission's estimate of the annualized 'competitive shortfall' of $1.5 billion that the proposed auctions are designed to deliver to retail investors."); Virtu Financial's Comment Letter on the Order Competition Rule Proposal, *supra* note 138, at 6 n.21 ("Virtu analyzed all marketable retail orders it received for 2020–2022 and found that the NBBO moved against investors on 20.15% of the shares and in investors' favor on 5.07% of the shares at 300ms from the time of order receipt [which] suggests a total cost to all retail investors of $2.911Bn/year. Significantly, even at just 100ms, this net cost is a staggering $2.597Bn/yr.").

[254] *See, e.g.*, Citadel Securities' Comment Letter on the Order Competition Rule Proposal, *supra* note 230, at 8 ("[T]he Commission elects to narrowly focus on a single metric – realized spread – 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 . . . ." (footnote omitted)); SIFMA's Comment Letter on the Market Structure Rule Proposals, *supra* note 223, at 22 ("The Commission . . . uses unreliable realized spread calculations to conclude that better executions are achieved on exchanges relative to wholesalers and does not perform an apples-to-apples comparison of wholesaler versus exchange executions based on realized spreads . . . .").

[255] *See, e.g.*, Charles Schwab's Comment Letter on the Market Structure Rule Proposals, *supra* note 187, at 11 ("The Commission's analysis asserts that 75% of shares on orders routed to wholesalers that did not receive a midpoint fill could have received a midpoint fill by interacting with midpoint peg orders. The Commission does admit that this liquidity is dispersed across exchanges and ATSs, and would be difficult or impossible to access but theorizes that the proposed auctions would serve as a 'coordination mechanism' to allow midpoint order submitters and individual investors to interact. The problem is this theorizing does not align with reality."); Lewis, *supra* note 176, para. 33, at 15, para. 37, at 17 ("Since the Commission's analysis matches retail orders to resting midpoint liquidity, a failure to control for order details, such as a size constraint, will include orders that could not have been executed in the manner assumed by the Commission, resulting in an overstatement of the potential benefits. . . . It does not necessarily follow that an investor making liquidity available at the midpoint on an ATS would be interested in participating in retail auctions under the Order Competition Rule Proposal, nor has the Commission demonstrated that such investors would likely participate in the auctions." (footnote omitted)).

Some of the variations of and substitutes for the proposed Order Competition Rule considered by the SEC feature RLPs as an approach to on-exchange segmentation.[256] Compared to other substitutes, such as the trade-at rule, "a new information barrier rule specifying new policies and procedures for wholesalers that must be part of the policies and procedures for protecting material, non-public information," and a rule mandating that "execution quality information concerning an individual investor's order be disclosed on their transaction confirmations,"[257] the use of RLPs appears to be a more targeted and realistic option. In one of the alternatives, the regulatory agency envisioned, *in addition to* the concept of auctions, the following form of on-exchange segmentation: "Separate trading mechanisms for segmented orders could also be priced in 0.1 cents increments, but, similar to current market practices, quotes in exchange RLP programs would not be displayed in exchange proprietary feeds or consolidated market data."[258] Yet another iteration, in addition to the concept of auctions,

> could also allow quotes in RLPs to be displayed in proprietary feeds and in consolidated market data. This would potentially increase the transparency of liquidity available to segmented orders and may further improve their order routing and execution quality compared to not displaying RLP quotes under this alternative. . . . Displaying exchange RLP quotes would provide more

---

[256] As described in their existing form by the SEC, "[T]he RLPs offered by many registered exchanges are specifically set up to segment the marketable order flow of individual investors, allowing liquidity suppliers to interact with this order flow without the risk that their orders will trade against the marketable orders of other market participants that may impose greater adverse selection risk. The pricing increments, both for quoting and trading, in RLPs, are usually 0.1 cents [being exempted by the SEC from the reach of Rule 612], although some exchanges have RLP programs that allow liquidity suppliers to quote only at the midpoint." Order Competition Rule Proposal, *supra* note 2, at 186–87 & n.411 (footnotes omitted). However, quotes in RLPs are not disseminated to the marketplace, with only limited information being provided: "[T]he SIP [Security Information Processor] disseminates a flag indicating the side of the market for which an exchange has an RLP quote available at a price better than the NBBO available. However, the SIP does not make known the price or the size of the RLP quote, which creates opacity in the liquidity available in RLP programs." *Id.* at 187.

[257] *Id.* at 227–28, 238–39.

[258] *Id.* at 229.

> transparency into the liquidity available to the orders of individual investors on these exchanges, which might result in more individual investor orders being routed to these exchanges when the prices of displayed quotes are equal to or better than the expected execution prices individual investor orders may expect to receive in qualified auctions (*e.g.*, if the RLP is posting a quote at the NBBO midpoint).[259]

By contrast, the SEC had specifically considered other alternatives as *substitutes* for the concept of auctions, such as "allowing exchanges to display quotes in retail liquidity programs" and "a separate retail NBBO."[260] More specifically, under this approach, securities exchanges would be able "to display the price and size of quotes in their RLP programs on their proprietary feeds and in the consolidated market data feed."[261] While the SEC did not explicitly specify what tick size regime would be applicable, the existing RLPs "have been granted an exemption from Rule 612 to provide executions in tenths of a penny,"[262] and one of the companion market structure proposals would "apply[] the proposed minimum pricing increments to the trading of NMS stocks regardless of trading venue."[263] The SEC also provided the following description of the potential competitive effect:

> Compared to the baseline, there would be greater transparency in the liquidity available to the marketable orders of individual investors. This could increase competition between exchange RLPs and wholesalers for the execution of individual investor marketable orders and result in more individual investor orders being executed in exchange RLPs (although the majority of individual investor orders would still likely be internalized by wholesalers). Because broker-dealers would be able to see the displayed quotes in RLPs, when marketable orders of individual investors are routed to execute in RLPs, it may be because the quoted prices in the RLP were better than the prices the wholesaler would have been willing to internalize the individual investor order at. Additionally, the increase in competition may result in wholesalers offering more price improvement to the

[259] *Id.*

[260] *Id.* at 226.

[261] *Id.* at 238.

[262] *Id.* at 144.

[263] Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2, at 80,269.

> marketable orders of individual investors to attract order flow from retail brokers.[264]

As an enhancement of the concept of displaying quotes in RLPs, the SEC also considered the so-called Retail Best Bid and Offer ("RBBO") as "a new, smaller-sized benchmark from the NBBO for segmented orders [that would] incorporate information from smaller odd lot quotations and quotes from exchange RLPs, which would be aggregated up across multiple price levels by individual exchanges until they exceeded a value of $500 or greater."[265] Moreover, "[t]he RBBO would be a protected quote for the purposes of executing segmented orders and would also be added as a benchmark in Rule 605 reports for calculating price improvements statistics for segmented orders."[266] The regulatory agency also pointed out the potential advantages of the concept of RBBO compared to the current market structure:

> [C]ompared to the baseline, there would be more price improvement and lower trading costs for marketable orders of individual investors. This would occur because wholesalers would need to offer price improvement against a tighter benchmark in order to internalize a segmented order. The disclosure of price improvement against the NBBO in Rule 605 reports might also enhance competition among wholesalers to offer greater price improvement in order to attract more order flow from retail brokers.[267]

Ultimately, the SEC rejected the alternative of displaying quotes in RLPs and its RBBO enhancement on the grounds that these measures, *relative* to the concept of auctions, would (i) result in more order flow being internalized by wholesalers and produce wider bid-ask spreads in

---

[264] Order Competition Rule Proposal, *supra* note 2, at 238.

[265] *Id.* at 239.

[266] *Id.* Although there was no reference to the duty of best execution, the mechanics of a protected quote would aim to prevent trade-throughs by analogy to Rule 611, which was in part designed to "backstop a broker's duty of best execution on an order-by-order basis by prohibiting the practice of executing orders at inferior prices, absent an applicable exception." Regulation NMS, Exchange Act Release No. 51,808, 70 Fed. Reg. 37,496, 37,516 (June 9, 2005) (codified at 17 C.F.R. pts. 200, 201, 230, 240, 242, 249 & 270), https://www.gpo.gov/fdsys/pkg/FR-2005-06-29/pdf/05-11802.pdf [https://perma.cc/ZZ9B-5N24] [hereinafter Regulation NMS].

[267] Order Competition Rule Proposal, *supra* note 2, at 239.

RLPs "to account for the risk of trading with individual investor order flow that imposed greater adverse selection risk [while] wholesalers would know the identity of the retail broker of the order they were handling [and] could avoid internalizing individual investor order flow that posed greater adverse selection risk and give greater price improvement to individual investor orders with less adverse selection risk," (ii) involve "less price improvement . . . because wholesalers would not need to compete on an order by order basis when they internalize an individual investor order," (iii) disadvantage institutional investors "because they would not be able to trade with marketable individual investor orders as frequently," and (iv) "allow wholesalers to pay more PFOF to retail brokers . . . since wholesalers would be able to internalize order flow at more profitable spreads."[268] In other words, the regulators once again endorsed a more granular form of segmentation, although, to the author's best knowledge, the original call for a "retail NBBO" by an industry commentator had specifically envisioned segmented order books on each securities exchange identifying specific brokerage firms.[269] Accordingly, it is feasible to redesign RLPs in a way to resemble off-exchange segmentation, although that approach would involve more complexity relative to the current state of RLPs. Furthermore, while institutional investors' trading strategies responding to specific retail orders would not be identical to the ones anticipating them, it is difficult to compare the expected participation rate from that perspective. Also, there are some similarities between maintaining quotes, without being required to do so continuously, and monitoring / responding to auctions.

---

[268] *Id.* at 238–39.

[269] @mittalbestex [Hitesh Mittal], X [TWITTER] (Oct. 28, 2021, 12:02 PM CST), https://twitter.com/mittalbestex/status/1453769169447571460; *see also* Fidelity's Comment Letter on the Market Structure Rule Proposals, *supra* note 248, at 26 ("[T]he Commission might consider rules allowing exchanges and ATS[s] to trade and segment pools/limit order books to *bona fide* retail orders either by retail MPID [market participant identifier] or other prearranged anonymous identifier.").

Although the SEC described this approach to RLPs as the one where "wholesalers would not need to compete on an order by order basis when they internalize an individual investor order,"[270] it still would introduce a powerful competitive force that would push in the direction of order-by-order competition. Competing *displayed* quotes for retail orders, potentially coming from a range of market participants, rather than hypothetical *undisplayed* price improvement opportunities, would be a restraining force on wholesalers for each order, although the order in question would not be exposed or announced to other market participants and order flow arrangements between customer-facing brokers and wholesalers could still exist.[271] Moreover, without a mandatory mechanism to direct such order flow for broader exposure, the wholesaler in question would be able to match—if not freeride—the best price, but not bypass it, at least

[270] Order Competition Rule Proposal, *supra* note 2, at 238.

[271] The SEC's original rationale for not displaying quotes in RLPs can be traced back to the concerns about "a variety of problems" presented by subpenny pricing at the time of the adoption of Rule 612 in 2005, and the waiver for RLPs was granted in part because "sub-penny prices will not be disseminated through the consolidated quotation data stream, which should avoid quote flickering and its reduced depth at the inside quotation." Order Granting Approval to Proposed Rule Changes by New York Stock Exchange LLC and NYSE Amex LLC to Establish Retail Liquidity Programs on a Pilot Basis and Granting Exemptions Pursuant to Rule 612(c) of Regulation NMS, Exchange Act Release No. 67,347, 77 Fed. Reg. 40,673, 40,681–82 (July 3, 2012), https://www.govinfo.gov/content/pkg/FR-2012-07-10/pdf/2012-16769.pdf [https://perma.cc/DX4T-9AW2]. However, putting aside the issue of displaying subpenny prices, it is not inconceivable that RLPs could have been implemented with displayed quotes in penny increments and a hidden subpenny price improvement component combined with ranking, as segmentation of retail flow could have permitted price improvement of at least one penny in many instances. Another potential variation, which was recently proposed by a major exchange group, would permit discretionary, as opposed to predetermined, price improvement similar to off-exchange price improvement practices: "The SEC should also seriously consider providing exchanges with the flexibility to attract retail liquidity by offering retail liquidity providers the option to post to exchanges at less aggressive prices but have the opportunity to improve the price of better-priced hidden orders on the same side and execute against an incoming retail removing order, at an improved price within their established discretionary price range." Patrick Sexton, Exec. Vice President, Gen. Couns. & Corp. Sec'y, Cboe Glob. Mkts., Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 11 (Aug. 23, 2023), https://www.sec.gov/comments/s7-31-22/s73122-249719-570262.pdf [https://perma.cc/B8KW-WBRM].

systematically, given that its compliance with the duty of best execution would be easier to monitor compared to the current market structure.[272] In addition, under the RBBO enhancement, there would be another mechanical restraint to ensure that better priced quotations are not being ignored. In addition, the critical take on regulatory reforms based on the relatively low share of the existing RLPs[273] should be questioned as currently there is no simple mechanism to direct order flow to RLPs in the absence of displayed quotes or even a strong incentive for wholesalers to expose lucrative order flow, which may also involve PFOF, in RLPs on an agency basis. Furthermore, since it is possible for a submitter of a retail order to get a free execution via an

---

[272] The option to engage in price matching may also create some room for wholesalers to engage in cherry picking. Notably, the SEC used essentially the same logic in describing one of the articulated limitations of the existing RLPs: "[W]holesalers who compete with RLPs lack the incentives to route the individual investor order flow with lower adverse selection risk to the RLPs. If only the individual investor order flow with higher adverse selection risk goes to RLPs, the liquidity providers in RLPs would widen spreads to reflect the increased adverse selection. This in turn, makes RLPs less competitive relative to wholesalers." Order Competition Rule Proposal, *supra* note 2, at 187 (footnote omitted). In fact, an empirical study concluded that RLPs "offer less price improvement on average than off-exchange wholesalers," but it also found that such programs "average an improvement of around 10% of the spread." Ernst et al., Would Order-by-Order Auctions Be Competitive?, *supra* note 120, at 41. These findings suggest that order flow currently routed to RLPs still has favorable characteristics in the aggregate rather than being treated as exhaust.

[273] *See, e.g.*, Stephen John Berger, Managing Dir., Glob. Head of Gov't & Regul. Pol'y, Citadel Sec. LLC, Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 17 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20164212-334052.pdf [https://perma.cc/A7TN-9GGD] [hereinafter Citadel Securities' Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal] ("The lack of competitiveness of exchange retail programs further demonstrates the Commission's flawed logic in asserting that the minimum quoting increment is disadvantaging exchanges and driving off-exchange trading. If that were true, exchange retail programs should flourish, as trading there can occur at 1/10 of a cent increments."); Brogaard, *supra* note 177, para. 74, at 32 ("The limited success of [RLPs] suggest that institutional investors are not eager to provide liquidity to retail investors. The SEC has not provided any empirical analysis to show why the OCR [Order Competition Rule] proposal would result in a different outcome than the current RLPs and why the auctions would serve as a more effective 'coordinating mechanism.'").

RLP,[274] a retail broker that does not accept PFOF may have a stronger incentive for sending its orders to an RLP than a wholesaler, but the former would need an appropriate order routing infrastructure, which entails additional costs.

Overarchingly, the approach to displaying quotes in RLPs has significant advantages in addition to a lower level of complexity, such as its integration with continuous limit order books that does not require speed bumps in the form of auctions with the corresponding risk of price fluctuations, the lack of potentially problematic interactions of different auctions, and the incentive to display quotes for the retail segment. Moreover, such displayed quotes could be aggregated across different RLPs to create a composite limit order book for retail order flow. In the author's view, this approach is one of the most realistic alternatives for regulatory reform, as well as a material constraint of the business model of off-exchange market makers. Interestingly, a number of key players in the securities industry, including several wholesalers, have endorsed a similar approach, suggesting such improvements to RLPs as displayed prices and sizes of trading interests, a finer price grid, and identification-based segmentation.[275]

---

[274] *See, e.g.*, N.Y. STOCK EXCH. LLC, NEW YORK STOCK EXCHANGE: PRICE LIST 2023, at 15 (rev. July 3, 2023), https://www.nyse.com/publicdocs/nyse/markets/nyse/NYSE_Price_List.pdf [https://perma.cc/E4DG-ATN8] (describing the fee-rebate structure for the NYSE's RLP).

[275] *See, e.g.*, Virtu Financial's Comment Letter on the Order Competition Rule Proposal, *supra* note 138, at 52 ("[T]he Commission could also have pursued its goals by exploring innovations or enhancements to existing retail liquidity programs, which are viewed as close analogues to its proposed auctions, and where participation has been minimal. The Commission could consider enabling complementary liquidity sources to interact more with retail by allowing them to display quotes at sub-penny increments. This would enable wholesalers to route to them more frequently. These displayed sub-penny quotes would be unprotected but the wholesalers would be expected to interact with them before internalizing at less favorable prices. This would address: (i) the criticism that 'retail is inaccessible' by making it accessible to anyone who wants to quote on an RLP venue; (ii) the criticism of an 'unlevel playing field' by allowing exchanges to quote in sub-pennies; and (iii) the criticisms that wholesaling has 'too much concentration' and 'lacks order-by order competition.'" (footnote omitted)); Calvin Hayes, Jane St. Capital, LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 6–7 (Mar. 31, 2023),

https://www.sec.gov/comments/s7-31-22/s73122-20163099-333099.pdf [https://perma.cc/7ZKL-ZS4B] ("[W]e recommend the Commission strengthen the existing exchange retail liquidity programs, both those eligible to quote in $0.001 increments as well as those offering midpoint pricing, by permitting exchanges to display the size and price of these quotes. This increased transparency could also be accompanied by the explicit inclusion of such liquidity in obligatory order-by-order best-execution analysis for eligible orders. . . . Notably, such a modification could be implemented at a small fraction of the cost of the Proposal and without the disruption and fragmentation that would be associated with potentially-overlapping [sic] periods of auction dissemination and resolution. In particular, we believe strengthened retail liquidity programs could represent a more straightforward opportunity for institutional investors to interact with marketable retail orders, as opposed to requiring such interest to regularly respond to auctions."); Patrick Sexton, Exec. Vice President, Gen. Couns. & Corp. Sec'y, Cboe Glob. Mkts., Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 11 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162799-332207.pdf [https://perma.cc/635V-VHZA] ("We do not believe mandating auctions for small held orders is the most prudent way to accomplish more midpoint trading. . . . [A]llowing Cboe to disclose price and size of orders pursuant to our Retail Price Improvement program would . . . bring additional order competition and visibility for retail orders."); MEMX's Comment Letter on the Market Structure Rule Proposals, *supra* note 251, at 37 ("MEMX's [proposed] retail midpoint liquidity program . . . would disseminate a retail liquidity identifier over the SIPs when there is resting midpoint liquidity entered into the program that is willing to trade with incoming marketable retail order flow. This solves the Commission's coordination problem by providing a mechanism to publicly advertise the availability of midpoint liquidity to brokers that handle retail order flow."); John A. Zecca, Exec. Vice President and Glob. Chief Legal, Risk & Regul. Officer, Nasdaq, Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 41 (Mar. 30, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162299-331153.pdf [https://perma.cc/7G9S-7BEC] [hereinafter Nasdaq's Comment Letter on the Market Structure Rule Proposals] ("As to retail liquidity programs, we ask the Commission to allow exchanges to operate these programs with more flexibility so that they can compete more effectively for retail orders. Exchanges that employ such programs should have exemptions from the minimum quoting rule so that they can accept, rank, and display orders in $0.0010 increments. There are many other aspects of flexibility that should be considered, such as the ability to attribute the originating broker, if not broadly, then at least as to the participant providing the price for that particular order. The SEC should not stand in the way of competitive venues setting up features that would allow for better competition for retail investor orders, including but not limited to better ways to segment retail order flow through better definitions of retail orders as such."); NYSE's Comment Letter on the Market Structure Rule Proposals, *supra* note 225, at 9 ("NYSE believes that potential innovations in RLP programs or other market-driven product enhancements could meet the Commission's goals [and] that the Commission should work with exchanges in allowing for greater innovation in RLP programs, including potentially allowing for greater display of interest eligible to trade in such programs and harmonized trading increments."); Hubert De Jesus, Managing Dir., Glob. Head of Mkt. Structure and Elec. Trading & Samantha DeZur, Managing Dir., Glob. Pub. Pol'y Grp., BlackRock, Inc., Comment Letter to the SEC on the Market Structure Rule Proposals 13 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20163995-

In addition to the proposed Order Competition Rule, the SEC has also advanced several other measures in the same regulatory package that have a connection to order-by-order competition. Importantly, the proposed Regulation Best Execution, yet another complex regulatory measure, aims to produce more order exposure, although from the angle of mandated policies and procedures rather through a formalized mechanical approach employed by its companion proposal. More generally, "a broker-dealer's policies and procedures would be required to address how it will . . . assess reasonably accessible and timely information, including information with respect to the best displayed prices, opportunities for price improvement, and order exposure opportunities that may result in the most favorable price."[276] Another key feature of the proposal is its coverage of "certain conflicted transactions with retail customers," which would include PFOF arrangements, exchange rebates, and integrated execution.[277] The regulatory agency also envisioned a variety of potential compliance approaches for different types of market players in the execution chain:

> For a retail broker-dealer in NMS stocks, its policies and procedures for the best market determination could include assessments of any assurances from a wholesaler that certain orders routed by the retail broker-dealer to the wholesaler would be guaranteed midpoint executions by the wholesaler or otherwise exposed to opportunities for midpoint executions. If midpoint executions were not guaranteed by a wholesaler, a retail broker-dealer's policies and procedures could

---

333998.pdf [https://perma.cc/2QXA-QQWU] [hereinafter BlackRock's Comment Letter on the Market Structure Rule Proposals] ("We believe that an efficient and effective alternative to the proposed qualified auction requirement would be to foster the development of existing [RLPs] and midpoint matching facilities by eliminating structural impediments to the broader adoption of these mechanisms. For example, in lieu of the proposed qualified auction mechanism, the Commission could allow venues to display sub-penny retail prices or establish order priority rules which promote retail liquidity and attract retail order flow. . . . [B]y enhancing the visibility of midpoint and better priced retail liquidity, wholesalers should be compelled by their duty of best execution to route retail orders to these facilities if they are not willing to internalize them at a comparable price, obviating the need for an explicit order competition rule." (italics removed)).

[276] Best Execution Rule Proposal, *supra* note 2, at 5449.

[277] *Id.* at 5440, 5464 & n.183.

> provide for assessments of whether customer orders would best be executed with midpoint liquidity that may be available on an exchange, ATS, or other market. Following an assessment of the opportunities for midpoint executions, a broker-dealer's policies and procedures could provide for an assessment of whether other price improvement opportunities might be available, such as from wholesalers, from resting liquidity between the best bid and offer on exchanges, through auctions, or otherwise. . . . For customer orders that a wholesaler intends to execute at prices worse than the midpoint, its policies and procedures could provide for an assessment of whether those orders would best be executed with midpoint liquidity that may be available on an exchange, ATS, or other market. A wholesaler's policies and procedures would also need to address how it will consider other opportunities for price improvement, which could include liquidity available on exchanges or other markets priced between the best bid and offer. Finally, these policies and procedures would need to address how the wholesaler will assess order exposure opportunities for customer orders that may result in the most favorable price for those orders.[278]

Putting aside the merits of the proposed Regulation Best Execution and its criticism coming from different segments of the securities industry,[279] the goal of additional order

---

[278] *Id.* at 5460.

[279] *See, e.g.*, Stephen John Berger, Managing Dir., Glob. Head of Gov't & Regul. Pol'y, Citadel Sec. LLC, Comment Letter to the SEC on the Regulation Best Execution Proposal 1 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20164210-334052.pdf [https://perma.cc/LCH3-ATN4] ("[The] proposal [would] override longstanding protective best execution rules with extremely onerous, arbitrary, and impractical requirements that [would] not benefit investors . . . ."); Nasdaq's Comment Letter on the Market Structure Rule Proposals, *supra* note 275, at 46–47 ("[T]he Proposal, as written, lacks clarity about the Commission's unique vision for best execution, and we are concerned that its interplay with existing rules will lead to confusion and duplication of efforts. . . . [T]he Commission has chosen to structure the Proposed Rule largely as a vague policies and procedures-based rule . . . ."); State Street's Comment Letter on the Market Structure Rule Proposals, *supra* note 250, at 5–6 ("State Street Global Advisors supports the goals of improving execution for individual investors. We are concerned, however, that the proposed rule's prescriptive approach to best execution (*i.e.*, the singular focus on price without adequately weighing other factors) would have the opposite effect, particularly for larger orders. . . . We are also concerned that the overlap of different best execution standards from the Commission, FINRA and other self-regulatory organizations . . . would add unnecessary costs and complexities for market participants, potentially weighing heavily on smaller broker-dealers. Since the existing best execution standards already ensure a high level of investor protection, these costs would have no clear benefit."); Tastytrade's Comment Letter on the Market Structure Rule Proposals, *supra* note 250, at 7 ("The Commission has not made clear why the existing best execution system, regulated by FINRA, needs change. Nor have the Commission addressed why the manner in which orders are currently competed for is ineffective. In its economic analysis, the Commission

exposure serves as a proxy for enhanced order-by-order competition, as it inherently involves more competition through multilateral trading venues. Viewing that approach as an additional restraint on the business model of wholesalers, the SEC "also preliminarily believes that the proposal would reduce the proportion of retail order flow that is internalized [and] increase competitive opportunities for exchanges and other trading venues because more broker-dealers will consider exchanges and ATSs as potential execution venues."[280]

Another notable measure related to order-by-order competition in the regulatory package aims at "fair competition and equal regulation between OTC market makers, exchanges, and ATSs that compete for retail liquidity by requiring that NMS stocks trade with the same minimum pricing increment regardless of venue (*i.e.*, on or off-exchange)."[281] Several stakeholders responded with the argument that the existing regulatory framework already puts different types of trading venues on an equal footing with respect to the tick size regime,[282] and,

---

has not clarified what the financial benefit to customers will be under Regulation Best Execution. Further the alleged benefits under Order Competition Rule cannot be independently verified. Finally, the criteria and manner with which broker dealers [sic] will be required to seek and execute orders strikes us as unnecessarily complex and overly burdensome.").

[280] Best Execution Rule Proposal, *supra* note 2, at 5535.

[281] Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2, at 80,279.

[282] *See, e.g.*, Citadel Securities' Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 273, at 14 ("[A]ll market centers are *already* on a level playing field with respect to trading since longstanding exchange retail programs facilitate trading at pricing increments inside the minimum quoting increment of one cent (including 1/10 of a cent and midpoint)."); Steve Quirk, Chief Brokerage Officer, Robinhood Mkts, Inc., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 54 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20162926-332838.pdf [https://perma.cc/3E5Z-UYYG] ("The Commission cites a 'more level playing field' for exchanges and off-exchange market centers as the basis for [the proposed] change . . . . [But] Rule 612 makes no prohibition on permissible trading increments off *or on* exchange. Accordingly, if exchanges want to compete for this order flow by providing additional price improvement in smaller increments, they are welcome to do so without the Commission's intervention."); Douglas A. Cifu, Chief Exec.

in the tick size regime proposal, the SEC itself had injected some uncertainty on the question whether securities exchanges and ATSs are subject to the same standard with respect to subpenny pricing.[283] In any instance, this harmonization of quoting and trading increments,

---

Officer, Virtu Fin., Inc., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 13 (Mar. 30, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20162672-331887.pdf [https://perma.cc/3MQ9-TXNH] [hereinafter Virtu Financial's Comment Letter on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal] ("[E]xisting quoting and trading increment rules *are already uniform across market centers* as there are uniform restrictions governing execution increments on any market center – exchange, ATS, or dealer."). In the author's view, this argument is erroneous as it ignores the distinction between securities exchanges as multilateral trading venues with predetermined order matching protocols, which also need to obtain a Rule 612 waiver from the SEC, in addition to the regular rulemaking process, to offer such execution options as RLPs, and wholesalers as trading firms that are able to offer discretionary—and more flexible—price improvement without any special regulatory approval. *See* Regulation NMS, *supra* note 266, at 37,556 (noting that "a broker-dealer could, consistent with the proposed rule, provide price improvement to a customer order that resulted in a sub-penny execution as long as the broker-dealer did not accept an order priced above $1.00 per share in a sub-penny increment" and stating that "Rule 612 will not prohibit a sub-penny execution resulting from a midpoint or volume-weighted algorithm or from price improvement, so long as the execution did not result from an impermissible sub-penny order or quotation"); Regulation of Exchanges and Alternative Trading Systems, Exchange Act Release No. 40,760, 63 Fed. Reg. 70, 844, 70,847, 70,853 (Dec. 8, 1998) (codified at 17 C.F.R. pts. 202, 240, 242 & 249), https://www.govinfo.gov/content/pkg/FR-1998-12-22/pdf/98-33299.pdf [https://perma.cc/2L6P-X6RR] (defining the term "exchange," with a potential exemption for ATSs, as a multilateral trading venue that "uses established, non-discretionary methods (whether by providing a trading facility or by setting rules) under which such orders interact with each other" and stating that the applicable coverage "explicitly exclude[es] registered market maker and single dealer systems, which commit capital in all—or almost all—trades").

[283] More specifically, the regulatory agency described in neutral terms, rather than explicitly specifying whether it is permissible or not, the practice of certain ATS of "offer[ing] sub-penny transactions separate from midpoint or benchmark [such as] order types which effectively split the distance between the NBB [National Best Bid] or NBO [National Best Offer] and the midpoint [as] a form of pre-set price improvement trades." Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2, at 80,306. Otherwise, the author is unaware of any legal authority or regulatory pronouncement maintaining that ATSs, despite being multilateral trading venues with predetermined order matching protocols, are subject to more flexible rules than securities exchanges. Moreover, the SEC itself had brought two enforcements actions against ATSs for essentially the same practice of spread splitting, also described as price improvement, as well as fixed subpenny offsets, as contrary to Rule 612. UBS Sec. LLC, Securities Act Release No. 9697, Exchange Act Release No.

which could otherwise be two distinct categories, has a long history,[284] and it could be seen as a key tool for enhancing order-by-order competition, especially between lit and dark liquidity. As pointed out by the SEC, the European regulatory regime under MiFID II recently embraced the same approach,[285] and, in fact, several public policy arguments in its favor were similar.[286] However, the harmonization of quoting and trading increments, which would apply the same tick size regime to off-exchange trading, is practical only if the price grid is sufficiently granular, and the proposed changes to the tick size regime do provide for the existence of several different subpenny price increments.[287] Moreover, the existence of the same tick size regime for both on-exchange and off-exchange trading could be of limited effect if there are significant restraints on

---

74,060, at 2–10 (Jan. 15, 2015) (settled proceeding), https://www.sec.gov/litigation/admin/2015/33-9697.pdf [https://perma.cc/TTF7-YP2T]; Credit Suisse Sec. (USA) LLC, Securities Act Release No. 10,013, Exchange Act Release No. 77,002, at 2–3, 6–7 (Jan. 31, 2016) (settled proceeding), https://www.sec.gov/litigation/admin/2016/33-10013.pdf [https://perma.cc/63VQ-A72B].

[284] *See, e.g.*, BLMIS's Comment Letter to on the Order Execution Obligations Rule Proposals, *supra* note 94, at 13–14 ("Another important standard that needs to be established is a uniform minimum increment for price improvement. . . . The SEC must level the playing field upon which market orders and limit orders compete for priority. . . . By establishing price improvement increments that are equal to the minimum quotation increment, the Commission would ensure the integrity of the price priority of the limit order in each market's quotations.").

[285] Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2, at 80,283 n.240.

[286] For a discussion of such arguments, see Dolgopolov, *Off-Exchange Market Makers and Their Best Execution Obligations*, *supra* note 15, at 488–90.

[287] *See* Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 2, at 80,280 (stating that, "[u]nder this proposal, the four potential minimum pricing increments for a particular NMS stock would be" $0.001, $0.002, $0.005, and $0.01). Moreover, even a finer price grid on its own could be a disruptive event for the business model of off-exchange market making, as illustrated by the transition to decimalization at the turn of the 21st century: "The large Wall Street firms' trading desks also have suffered under decimals, but no one has been hit as hard as the wholesale market-makers. . . . The result is that Knight, Schwab, and others are now doing the opposite of payment for order flow and are asking brokers to pay *them* a commission to execute their orders. In a matter of months, the wholesalers went from being kings of the hill to having to rethink their business models." ARTHUR LEVITT WITH PAULA DWYER, TAKE ON THE STREET: HOW TO FIGHT FOR YOUR FINANCIAL FUTURE 208 (rev. ed. 2003).

segmentation for the former category.[288] One might also anticipate the emergence of practices to side-step such harmonization under the proposed tick size regime. For instance, a representative of a leading wholesaler recently commented on this contemplated regulatory change and observed that a wholesaler could simply split a single retail order routed to it and execute such fractional orders at different prices in order to achieve some desired average price.[289] Given that wholesalers exercise a great deal of discretion over order flow they handle, it is possible to split a retail order, potentially even into one-share orders, and execute such orders simultaneously, which, of course, would be very different from splitting an order in a limit order book on a securities exchange or an ATS. Accordingly, should the regulators pursue this approach, there needs to be a pronouncement whether this potential practice would be permissible or not as a deviation from the proposed tick size regime. Moreover, this concern would have to be addressed even under the scenario of different quoting and trading increments.

Not surprisingly, several wholesalers, which would probably be greatly impacted by the proposed harmonization, opposed this measure.[290] However, other constituencies resisted this

---

[288] Notably, a leading wholesaler asserted that "analyzing data for stocks that have quoted spreads that are much wider than the minimum quoting increment clearly demonstrates that the minimum quoting increment is not the cause of off-exchange retail trading." Citadel Securities' Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 273, at 15–16. In fact, the study in question suggested that this phenomenon is driven by segmentation. CITADEL SEC. LLC, UNLEVEL PLAYING FIELD? WHAT 605S CAN TELL US ABOUT TICK SIZES 2, 4 (Sept. 2022), https://www.citadelsecurities.com/wp-content/uploads/sites/2/2022/09/Market-Lens-September-2022.pdf [https://perma.cc/N78J-EBES]. While this explanation is essentially trivial, the issue of competitive advantages and disadvantages still matters, for instance, in the context of hypothetical transactions that the lit market could have captured or competed for at a given more granular price less than one existing tick size away.

[289] *SIFMA Equity Market Structure Roundtable, Part I*, *supra* note 139, at 0:55:20–:59 (remarks of Joseph Mecane, Citadel Securities LLC).

[290] *See, e.g.*, Citadel Securities' Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 273, at 18 ("Ignoring the execution

approach as well. Even several major exchange groups, perhaps as a compromise that would still put them on an equal footing with wholesalers, endorsed the idea of uniform and yet distinct quoting and trading increments.[291] Likewise, several commenters from the institutional investor

---

quality delivered to retail investors under the current market structure, the Commission elects to tilt the playing field in favor of the exchanges in the hope that it will reduce off-exchange retail trading. This is done by attempting to restrict the prices at which trading can occur, with full knowledge that any such restrictions will disproportionately impact the off-exchange market centers where most retail transactions are executed today. . . . While this could make it more difficult for wholesale broker-dealers to offer better prices than quoted on exchange (meaning that off-exchange retail trading may decline), the real negative impact would likely be borne by retail investors through worse execution quality."); Virtu Financial's Comment Letter on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal, *supra* note 282, at 2 ("The notion that tick sizes need to be harmonized is a red herring aimed at masking the Commission's real objective – the elimination of off-exchange trading and the wholesaling business in order to drive more trading activity back to exchanges."); *but see* Adam Nunes, Hudson River Trading LLC, Comment Letter to the SEC on the Market Structure Rule Proposals 3 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162946-332891.pdf [https://perma.cc/2JEN-TTWT] ("Hudson River Trading generally agrees with the Commission's goal to implement a minimum pricing increment regime that covers both quoting and trading and is uniform across market center types. . . . Various commenters have proposed a regime that provides for different quoting and trading increments . . . that are uniform across market center types. We are concerned that such a regime could harm market quality with respect to on-exchange trading, which could lead to wider spreads that are used by off-exchange market centers. Specifically . . . this proposed regime would allow market participants to submit non-displayed orders on exchanges at price points that would not be permissible for displayed orders. This ability to step ahead of displayed orders would reduce the incentive to post displayed orders." (footnote omitted)).

[291] Nasdaq's Comment Letter on the Market Structure Rule Proposals, *supra* note 275, at 18 ("The Proposal requires venues to use the same minimum pricing increments for executing trades as for quoting bids and offers. This type of harmonization may erase opportunities for price improvement, however. We therefore suggest standards that allow flexibility in executing trades at finer increments of $0.0010 for retail orders, provided that trades in such finer increments reflect the overall provision of meaningful price improvement to justify such actions . . . ."); NYSE's Comment Letter on the Market Structure Rule Proposals, *supra* note 225, at 6 ("Once tick constrained securities are identified, NYSE proposes changing the quoting increment of such securities to $0.005. . . . NYSE recommends establishing a common trading increment of $0.001 for securities priced above $1.00 that would be applicable for both on and off exchange trading. . . . NYSE believes that a harmonized trading increment of $0.001 would preserve meaningful price improvement opportunities for retail while allowing public investors to compete with bi-lateral trading through the use of exchange RLP programs. Establishing a common minimum trade increment would improve the relative competitiveness of RLP programs; further enhancements to RLP program design, such as

community were skeptical about applying the same price grid to quoting and trading increments, sometimes explicitly expressing doubts that the proposed regulatory approach would enhance interaction between institutional and retail orders.[292] On the other hand, several institutional

---

displaying the price and size of available RLP liquidity, would promote determinism in execution price and allow public market participants to be on a more level competitive playing field."); *see also* Joint Comment Letter by NYSE, Charles Schwab & Citadel Securities to the SEC on the Market Structure Rule Proposals, *supra* note 245, at 2 ("[W]e recommend setting a market-wide harmonized trading increment of $.001 for all symbols trading at or above $1.00 per share. In our view, the minimum quoting increment and the minimum trading increment do not need to be the same.").

[292] *See, e.g.*, Jiří Król, Deputy Chief Exec. Officer & Glob. Head of Gov't Affairs, Alt. Inv. Mgmt. Ass'n, Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 2–3 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20164218-334032.pdf [https://perma.cc/X8HW-ZFN8] ("[W]e believe that any move to reduce tick sizes should focus on the quoting increment only, and not on the trading increment [as the proposed regulatory approach] would harm investor choice and limit the potential for investors to obtain the best possible price for their orders."); Joseph Scafidi, Glob. Head of Trading & Carlos Oliveira, Head of Trading Analytics and Mkt. Structure, Brandes Inv. Partners, L.P., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 2–3 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20163075-333040.pdf [https://perma.cc/7AKY-XQRD] ("Regarding minimum trading increments, a potential benefit is setting a standard that would facilitate the ability of orders from retail and institutional investors to interact. . . . We understand that the Commission has endeavored to level the playing field across trading venues by harmonizing tick and trading increments across all of them. This would be a meaningful change that could improve market quality, or materially undermine it, and we and other industry participants are not convinced that the impacts have been sufficiently identified and analyzed. That said, rather than taking such costly and uncertain approach, we believe a minimum trading increments of $0.001 . . . across different trading centers would be appropriate, whether applied to trading generally or to orders generated by retail investors."); Gregory Davis, Managing Dir. and Chief Inv. Officer & Matthew Benchner, Managing Dir., Personal Inv., The Vanguard Grp., Inc., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 5 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162793-332197.pdf [https://perma.cc/ZYN7-T9Q8] ("Though we support reducing tick sizes to one half of a cent for some stocks, we are concerned that the proposal to harmonize quoting and trading in even smaller increments may reduce liquidity and inadvertently harm investors and markets. . . . In addition, the proposal to harmonize trading increments at the minimum tick size could cause retail investors who trade stocks or ETFs [exchange-traded funds] through brokerage accounts to lose the benefit of the sub-spread price improvement they receive today. . . . [T]he Commission could lower the minimum

investors expressed the view that a smaller tick size by itself could enhance this type of interaction, while voicing a concern about tick sizes becoming too small.[293]

Even these related measures in the companion proposals illustrate that the proposed regulatory approach to implementing order-by-order competition is facing nontrivial challenges,

---

quoting increment for tick-constrained stocks to a half-penny and raise the minimum trading increment to a tenth of a penny for all stocks priced at $1.00 or more per share.").

[293] *See, e.g.,* Kevin Duggan, Senior Managing Dir., Ont. Teachers' Pension Plan et al., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 2 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20163096-333095.pdf [https://perma.cc/4FML-VSAK] ("The existing $0.01 tick increment prevents exchanges from displaying prices available to retail investors inside the one-cent minimum. One way to increase opportunities for investor orders to interact would be to allow exchanges to fully display orders willing to trade with orders from retail investors, at sub-penny increments. This improved transparency could increase opportunities for investors to find each other and trade at mutually beneficial prices. . . . At the same time, we believe the Commission should be targeted and deliberate in reducing the tick size. A more severe tick size reduction for the most actively-traded [sic] securities . . . could increase existing speed advantages of electronic trading firms when trading on exchanges."); *see also* Sarah A. Bessin, Deputy Gen. Couns. & Nhan Nguyen, Assistant Gen. Couns., Inv. Co. Inst., Comment Letter to the SEC on Regulation NMS: Minimum Pricing Increments, Access Fees, and Transparency of Better Priced Orders Proposal 9–12 (Mar. 31, 2023), https://www.sec.gov/comments/s7-30-22/s73022-20162791-332193.pdf [https://perma.cc/54NE-595B] ("[W]e strongly oppose the proposed $0.001 and $0.002 tick increments without first conducting further analysis . . . . Such increments are excessively granular, and the Commission does not provide adequate data or other justifications to support them. Importantly . . . these increments would create risks of significant market harm, increased operational complexity, and unintended consequences to funds and other institutional investors. . . . Of greatest concern is that overly granular increments would enable 'pennying,' in which a market participant can gain execution priority over another participant by outbidding by an economically insignificant amount—in this case, by as little as $0.001 or $0.002 for the same security. This practice would have several negative consequences, such as making it more difficult for funds to execute large orders and subjecting them to execution delays, resulting in price slippage that translates to additional costs for fund investors. This would further disincentivize displaying of limit orders in large size on exchange, and further incentivize participants to trade via off-exchange, non-displayed trading venues. This, in turn, would contribute to even greater market fragmentation and increased dispersion of market liquidity across different market centers. . . . Second, we are concerned that excessively granular sub-penny increments could negatively affect quoted market depth, which is critical for funds and advisers seeking to execute large orders. . . . Third, we are also concerned that overly granular quoting increments, which result in a greater number of price points, would significantly and needlessly increase operational complexity for market participants." (footnotes omitted)).

with a significant degree of industry resistance and alternative solutions being floated. The proposed Order Competition Rule itself is likely to go through additional rounds of heated debates and revisions, as well as comparisons against its alternatives, with the overall architecture of the equities space in the background.

CONCLUSION

In its recent regulatory package, the regulators have aimed at a truly herculean task of implementing order-by-order competition in the contest of a holistic reassessment of equity market structure and address the balance between competition among markets and competition among orders.[294] Some of the key features of the proposed regulatory approach would have a critical impact on the business model of wholesalers and their order flow arrangements with retail brokers. Balancing pros and cons of different models of competition, namely, the one embodied by the current market structure and its potential alternatives tweaked by regulatory innovations, is a challenging and multifaceted task, as aptly illustrated by the regulators' previous attempts to address the underlying issues. In fact, one of the chief concerns is whether

[294] Not surprisingly, this balance was illustrated decades ago specifically in the context of off-exchange market making with the complaint that, "by focusing on competition between markets, there has been a lessened focus on increasing competition among customer orders." *National Market System House Hearings*, *supra* note 121, at 74 (prepared statement of William H. Donaldson, Chairman and Chief Executive Officer, the New York Stock Exchange). In turn, one criticism of the proposed Order Competition Rule appeals to the language of Regulation NMS that "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," interpreting the proposal as "a completely centralized system . . . requiring nearly all retail marketable orders to be sent to an auction mechanism that, in practice, only exchanges will be permitted to offer." Citadel Securities' Comment Letter on the Order Competition Rule Proposal, *supra* note 230, at 21& n.75 (quoting Regulation NMS, *supra* note 266, at 37,499).

the SEC's proposed regulatory approach would be too prescriptive and complex,[295] which should be considered in conjunction with various stakeholders' interests being affected and the very level of industry resistance that might lead to a protracted courtroom battle. Accordingly, the pace of adoption should not be expected to be quick. Moreover, some compromise solutions, including the ones that introduce additional competition as a restraint on order flow arrangements, are feasible. Such compromises, by definition, are likely to be incremental and hence less radical for the equities space, but cautious experimentation, incremental changes, and coalition-building across different constituencies have their own advantages.

The host of issues relevant for order-by-order competition includes the limits on segmentation, as opposed to some hypothetical all-to-all market structure, and the challenges of reconciling segmentation with order-by-order competition in an efficient manner. Another related consideration is the impact of various regulatory approaches on such dimensions as retail versus institutional traders, small versus large orders, and more liquid versus less liquid securities, let alone the impact on the respective business models of different constituencies. A broader question, putting aside any immediate wealth redistributions among different types of market participants, is to what extent segmentation might interfere with the marketplace as a whole in the long run.[296]

---

[295] *See, e.g.*, BlackRock's Comment Letter on the Market Structure Rule Proposals, *supra* note 275, at 12 ("The complexity and highly prescriptive nature of qualified auctions, where every element from execution priority to auction duration has been rigorously stipulated is of primary concern to us. A regulatory framework which is too rigid stifles innovation and inhibits the ability of trading venues to create market solutions for retail orders.").

[296] *See, e.g.*, Professor Harris's Comment Letter on the Order Competition Rule Proposal, *supra* note 225, at 6 ("[S]egregation hurts well-informed traders whose research efforts help ensure that prices reflect values. . . . Since informative prices are essential to our economy, the SEC should consider whether the short-term benefits that retail traders obtain from price discrimination in their favor are worth the additional burden (increased liquidity costs) that removing them from exchange markets imposes upon well-informed traders. The SEC also should consider whether

Ultimately, it is about the extent to which the modern electronic marketplace could support a partial value-creating disintermediation and an enhanced interaction of natural liquidity, whether institutional-to-retail or retail-to-retail,[297] while recognizing the enduring role of specialized market makers. Potentially, there is some room for a greater degree of commodification of executions services outside of bilateral relationships, which could bring additional efficiencies to the marketplace as a whole. This type of commodification may potentially involve the emergence of a new class of liquidity providers handling a big chunk of retail order flow, for instance, via RLPs or auction facilities.

---

retail traders benefit substantially from trading at prices that would be more informative if everyone traded in exchange markets.").

[297] *See, e.g.*, BestEx's Comment Letter on the Order Competition Rule Proposal, *supra* note 135, at 2 ("We believe that institutional investors, via their brokers' algorithms and smart order routers, are likely to save even more than retail investors in reduced price impact and spread costs by interacting with retail order flow through the newly proposed auction mechanism."); Sean Paylor, Acadian Asset Mgmt. LLC, Comment Letter to the SEC on the Order Competition Rule Proposal 3 (Mar. 31, 2023), https://www.sec.gov/comments/s7-32-22/s73222-20163546-333885.pdf [https://perma.cc/6FVB-A2TY] ("Institutional investors have an incentive to consider all sources of liquidity at our disposal, especially mechanisms that provide access to liquidity that exhibits lower adverse selection. For this reason, we expect institutional investors to regularly participate in the proposed retail auctions, should they facilitate direct, unmediated interaction between institutional and retail orders."); MITTAL & BERKOW, *supra* note 115, at 14 (As a result of [the] bifurcation of retail flow [in the current market structure], limit orders from retail investors lose the opportunity to interact with retail market orders and instead only interact with the more toxic flow on exchanges, yielding the same higher adverse selection and lower fill rates other investors face."); *see also* Sarah A. Bessin, Deputy Gen. Couns. & Kevin Ercoline, Assistant Gen. Couns., Inv. Co. Inst., Comment Letter to the SEC on the Regulation Best Execution and Order Competition Rule Proposals 15 (Mar. 31, 2023), https://www.sec.gov/comments/s7-31-22/s73122-20162786-332187.pdf [https://perma.cc/4KZR-6TDD] ("[W]hile some members may step in for certain executions, there are a variety of reasons institutional investors may choose not to participate in an auction.").