

INITIAL DECISION RELEASE NO. 1015
ADMINISTRATIVE PROCEEDING
FILE NO. 3-15350

UNITED STATES OF AMERICA
Before the
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

In the Matter of the Application of
SECURITIES INDUSTRY AND FINANCIAL
MARKETS ASSOCIATION

for Review of Actions Taken by
Self-Regulatory Organizations

INITIAL DECISION (PUBLIC)¹
June 1, 2016

APPEARANCES:

Daniel G. Swanson, Eugene Scalia, Joshua Lipton, Amir C. Tayrani, and Thomas M. Johnson, Jr., Gibson, Dunn & Crutcher LLP, for Nasdaq Stock Market LLC

Stephen D. Susman and Jacob W. Buchdahl, Susman Godfrey LLP, for Nasdaq Stock Market LLC

Jeffrey S. Davis and John Yetter, Nasdaq OMX, for Nasdaq Stock Market LLC

Douglas W. Henkin, Seth T. Taube, Patrick Marecki, and Charles Loughlin, Baker Botts LLP, for NYSE Arca, Inc.

Michael D. Warden, HL Rogers, Eric D. McArthur, Benjamin Beaton, and Kevin P. Garvey, Sidley Austin LLP, for Applicant Securities Industry and Financial Markets Association

BEFORE:

Brenda P. Murray, Chief Administrative Law Judge

BACKGROUND

This proceeding concerns applications filed by the Securities Industry and Financial Markets Association (SIFMA),² pursuant to Section 19(d) of the Securities Exchange Act of

¹ This public initial decision contains redactions and minor modifications from the original sealed initial decision issued on June 1, 2016, as discussed in an order issued on June 28, 2016.

1934, to set aside certain rule changes made by NYSE Arca, Inc. (NYSE Arca), and Nasdaq Stock Market LLC (Nasdaq) (collectively with NYSE Arca, the Exchanges), regarding fees for depth-of-book market data.

Securities exchanges aggregate and assimilate many types of market data derived from the orders and trades conducted on their platforms. SIFMA Ex. 376 at 13563.³ The Commission has referred to subsets of this market data as “core data” and “non-core data.” *Id.* at 13567-68; *see* Order Setting Aside Action by Delegated Authority and Approving Proposed Rule Change Relating to NYSE Arca Data (2008 ArcaBook Order), Exchange Act Release No. 59039, 73 Fed. Reg. 74770, 74771 (Dec. 9, 2008). The rule changes at issue concern fees assessed by the Exchanges to access their non-core “depth-of-book” data. For each security, core data include: (1) a national best bid and offer (NBBO), (2) the best bids and offers from each exchange, and (3) the last sales reports from each exchange. 2008 ArcaBook Order, 73 Fed. Reg. at 74780. By law, securities exchanges must provide core data to central processors, known as Securities Information Processors (SIPs), who use that information to calculate the NBBO for each security. 17 C.F.R. § 242.603(b); SIFMA Ex. 376 at 13567-68. NBBO, or “top-of-book” data, provide a view of availability by showing the quantities available at the best (lowest) offer price and the best (highest) bid price. NYSE Arca Ex. 65 at 1545. The SIPs then distribute this information in a consolidated feed available to the public, which broker-dealers must purchase and make available to investors seeking to place a trade. 17 C.F.R. § 242.603(b), (c); 2008 ArcaBook Order, 73 Fed. Reg. at 74780; SIFMA Ex. 376 at 13567-68.

Non-core depth-of-book data “consists of outstanding limit orders to buy stock at prices lower than, or to sell stocks at prices higher than, the best prices on each exchange.”⁴ *NetCoalition v. SEC (NetCoalition I)*, 615 F.3d 525, 529-30 (D.C. Cir. 2010), *superseded on other grounds by statute as stated in* 715 F.3d 342 (D.C. Cir. 2013) (*NetCoalition II*). Depth-of-book data show the displayable “shares available to buy at every single price level and the shares available for sale at every price level,” and contain a summary of an exchange’s limit-order book, which consists of all pending displayed limit orders. Tr. 21; NYSE Arca Ex. 65 at 1545. This information allows a trader to learn the displayed liquidity—the amount of stock available

² SIFMA sees itself as “the voice of the nation’s securities industry, bringing together the shared interests of hundreds of broker-dealers, banks and asset managers.” <http://www.sifma.org/about/> (last visited May 24, 2016).

³ I will cite to the transcript of the hearing as “Tr. ___.” I will cite to the NYSE Arca, Nasdaq, and SIFMA exhibits as “NYSE Arca Ex. ___,” “Nasdaq Ex. ___,” and “SIFMA Ex. ___.” Many exhibits contain multiple sets of pagination. When available, I cite to the last non-zero numerical digits of their Bates numbers. I will use similar designations in citations to the prehearing and post-hearing filings.

⁴ A limit order can be contrasted from a market order. A market order is an order to buy or sell immediately, at the best price available in the market. *See* SIFMA Ex. 376 at 13564. For a limit order, the buyer places a bid on the highest price he is willing to pay to purchase a specific stock, and a seller sets an “ask” or “offer” on the lowest price he is willing to accept for the sale of a specific stock. *See id.*

at a price other than the best price—of a security on a particular exchange. *See NetCoalition I*, 615 F.3d at 530. Because it is not core data, securities exchanges are not required to distribute depth-of-book data. 2008 ArcaBook Order, 73 Fed. Reg. at 74779. Exchanges that distribute depth-of-book data generally sell it to customers either through a direct feed, or indirectly through redistributors like Bloomberg and Thomson Reuters. NYSE Arca Ex. 65 at 1548.

The parties agree that the fees concerning at least two depth-of-book products are at issue. The first product is NYSE Arca’s depth-of-book product, ArcaBook. The second product is Nasdaq’s Level 2 depth-of-book product, which “provides information on the best price quoted by each market participant, but does not include every price quoted by each participant.” Nasdaq Ex. 601 at 9.⁵

Nasdaq and SIFMA dispute whether fees for two additional Nasdaq depth-of-book products are at issue: OpenView, which provides depth-of-book information “on stocks traded on NASDAQ but listed on . . . other exchanges,” and TotalView, which provides “every bid and offer . . . for stocks listed on NASDAQ.” Nasdaq Ex. 601 at 9; *see* Nasdaq Br. at 1 n.1; SIFMA Br. at 4 n.1. I rule on whether these two products are at issue later in this initial decision.

Procedural background and prior proceedings

This proceeding is the most recent in a lengthy line of challenges brought by SIFMA and other parties before the Commission and the United States Court of Appeals for the District of Columbia Circuit. In large part, these earlier challenges inform and control this current proceeding and therefore require discussion.

On May 23, 2006, NYSE Arca filed a proposed rule change with the Commission (the 2006 ArcaBook Rule), seeking to impose a fee for its ArcaBook depth-of-book product, which had previously been free.⁶ NYSE Arca Ex. 11. Under the law at the time, the 2006 ArcaBook Rule did not take effect until approved; it went through a notice-and-comment period and received Commission approval. 15 U.S.C. §78s(b) (2006); *NetCoalition I*, 615 F.3d at 528, 532. On October 12, 2006, the Division of Market Regulation (now known as the Division of Trading and Markets) approved the 2006 ArcaBook Rule under delegated authority. *See* NYSE Arca Ex. 67. NetCoalition, a trade association, then filed a petition seeking review of the 2006 ArcaBook Rule by the Commission. *NetCoalition I*, 615 F.3d at 527, 532. On December 2, 2008, after extensive briefing, the Commission approved the 2006 ArcaBook Rule and determined that the fees were consistent with the Exchange Act by applying a “market-based approach.” 2008 ArcaBook Order, 73 Fed. Reg. at 74770, 74781, 74797.

⁵ Nasdaq Exhibit 601 has two sets of pagination; when citing to this exhibit, I refer to the pagination at the bottom of the page.

⁶ Nasdaq and NYSE Arca are self-regulatory organizations (SROs) registered with the Commission. *See* 15 U.S.C. § 78f. For the most part, when SROs seek to establish new rules or modify existing ones, they must first go through a notice-and-comment period and obtain Commission approval. 15 U.S.C. § 78s(b). As discussed later in this decision, a subset of SRO rules—including the rules implementing the disputed fees for depth-of-book data—can become effective immediately upon filing, subject to later Commission review. *Id.* § 78s(b)(3)(A), (C).

In the 2008 ArcaBook Order, the Commission effectively rejected claims that the data fees sought to be imposed must bear a relation to the costs of collecting the data, and it found that NYSE Arca was subject to two significant competitive forces in setting fees for ArcaBook. *See* 2008 ArcaBook Order, 73 Fed. Reg. at 74773-74, 74782, 74794. First, the Commission concluded that the need to attract order flow “imposes significant pressure on NYSE Arca to act reasonably in setting its fees for depth-of-book order data, particularly given that the market participants that must pay such fees often will be the same market participants from whom NYSE Arca must attract order flow.” *Id.* at 74783. Second, the Commission held that “a variety of alternative sources of information . . . impose significant competitive pressures” on ArcaBook data. *Id.* at 74785. The Commission also found no “substantial countervailing basis” to disapprove the 2006 ArcaBook Rule. *Id.* at 74794.

In *NetCoalition I*, an appeal by NetCoalition and SIFMA of the 2008 ArcaBook Order, the D.C. Circuit vacated the order on the grounds that the Commission “failed to disclose a reasoned basis . . . for concluding that NYSE Arca [was] subject to significant competitive forces in pricing ArcaBook.”⁷ *NetCoalition I*, 615 F.3d at 544 (internal quotation marks omitted). In particular, the court noted numerous problems with the evidence supporting the Commission’s conclusions. Much of the evidence cited, purportedly showing that order flow competition constrains market data prices, consisted of little beyond the “self-serving views” of NYSE Arca and other exchanges. *Id.* at 541. Moreover, the Commission’s theory that ArcaBook prices would be kept low to attract order flow was contradicted by the Commission’s insistence that depth-of-book data are “unnecessary” and of “limited appeal” to most investors. *Id.* at 540. And the Commission’s argument—that prices were constrained by the existence of alternatives to ArcaBook—had failed to assess: whether the alternatives were “reasonably interchangeable” substitutes, the product’s elasticity of demand, “the number of potential users or how they might react to a change in price,” or numerous other factors controlling trader behavior. *Id.* at 542-44. The court also explained why the alternatives identified by the Commission might be ineffective substitutes for ArcaBook data. *Id.* at 543-44. On November 9, 2010, the court’s decision vacating the 2008 ArcaBook Order became effective. *SIFMA*, Exchange Act Release No. 72182, 2014 SEC LEXIS 1686, at *15-16 (May 16, 2014) (discussing procedural history).

⁷ The D.C. Circuit held that the Commission’s use of a market-based approach to evaluate the 2006 ArcaBook Rule was permissible and that a cost-based approach was not required under the Exchange Act. *NetCoalition I*, 615 F.3d at 534-35. It did, however, note:

[W]e do not mean to say that a cost analysis is irrelevant. On the contrary, in a competitive market, the price of a product is supposed to approach its marginal cost, *i.e.*, the seller’s cost of producing one additional unit. Supracompetitive pricing may be evidence of ‘monopoly,’ or ‘market,’ power. Thus, the costs of collecting the distributing market data can indicate whether an exchange is taking ‘excessive profits’ or subsidizing its service with another source of revenue

Id. at 537 (internal citations omitted).

Shortly before the D.C. Circuit issued *NetCoalition I*, Congress enacted the Dodd-Frank Act.⁸ Before Dodd-Frank, fees like the 2006 ArcaBook Rule became effective only upon Commission approval. Dodd-Frank, effective July 22, 2010, changed this framework, by allowing such fees to become effective immediately upon filing. 15 U.S.C. § 78s(b)(3)(A).⁹ The Commission retained the ability, within sixty days of filing, to “temporarily suspend the change in the rules of the [SRO] . . . if it appears to the Commission that such action is necessary or appropriate in the public interest.” *Id.* § 78s(b)(3)(C). Upon such suspension, the Commission must institute proceedings “to determine whether the proposed rule should be approved or disapproved.” *Id.*

On September 7, 2010, Nasdaq filed with the Commission a notice of a rule change (2010 Nasdaq Rule) representing that it was seeking to harmonize certain fees between three depth-of-book data products: Level 2, TotalView, and OpenView. Nasdaq Ex. 548. The 2010 Nasdaq Rule became effective immediately, and the Commission did not act within sixty days of filing to temporarily suspend the rule change.

On November 1, 2010, NYSE Arca filed with the Commission a notice of a rule change (2010 ArcaBook Rule). *SIFMA*, 2014 SEC LEXIS 1686, at *15. The 2010 ArcaBook Rule, which also became effective immediately, assessed the same fees for ArcaBook that had been proposed in the 2006 ArcaBook Rule. *Id.*; NYSE Arca Ex. 1 at 4. The Commission had approved those fees in the vacated 2008 ArcaBook Order, and NYSE Arca had been assessing them since the beginning of 2009. NYSE Arca Ex. 1 at 3-4.

On November 9, 2010, the Commission issued a notice soliciting comments on the 2010 ArcaBook Rule. *See* NYSE Arca Ex. 1. NetCoalition and SIFMA submitted a joint comment, alleging that NYSE Arca sought to assess the same fees that the *NetCoalition I* court held had not been determined to be “fair and reasonable” under the Exchange Act, and that in doing so, NYSE Arca was relying on the same evidence and theories that *NetCoalition I* had rejected. SIFMA Ex. 65 at 1567, 1570. As with the 2010 Nasdaq Rule, the sixty-day period during which the Commission could suspend the 2010 ArcaBook Rule expired without the Commission taking any action. *SIFMA*, 2014 SEC LEXIS 1686, at *18.

On December 28, 2010, and January 3, 2011, respectively, NetCoalition and SIFMA petitioned the D.C. Circuit to review the non-suspension of the 2010 Nasdaq Rule and the 2010

⁸ *See also* Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. 111-203, § 4, 124 Stat. 1376, 1390 (July 21, 2010).

⁹ Dodd-Frank amended Exchange Act Section 19(b)(3)(A), which lays out certain SRO rule changes that are immediately effective. Prior to Dodd-Frank, SRO rule changes “establishing or changing a due, fee, or other charge imposed by the [SRO] . . . may take effect upon filing.” 15 U.S.C. § 78s(b)(3)(A)(ii) (2006) (emphasis added). Dodd-Frank changed that language to “shall take effect upon filing” and broadened it to apply to fees imposed by the SRO not just on its own members, but also “on any person, whether or not the person is a member of the [SRO].” Dodd-Frank, 124 Stat. at 1835; 15 U.S.C. § 78s(b)(3)(A)(ii) (emphasis added); *SIFMA*, 2014 SEC LEXIS 1686, at *14 & n.36.

ArcaBook Rule. Petition for Review, *NetCoalition v. SEC*, No. 10-1422 (challenge to 2010 NASDAQ Rule); Petition for Review, *NetCoalition v. SEC*, No. 11-1001 (challenge to 2010 ArcaBook Rule). The D.C. Circuit consolidated these two proceedings along with several other SRO fee rules challenges brought by NetCoalition and SIFMA, but later dismissed them for lack of jurisdiction. Order, *NetCoalition v. SEC*, Case No. 10-1421 (D.C. Cir. June 3, 2011); *NetCoalition II*, 715 F.3d 342 (D.C. Cir. 2013).

The *NetCoalition II* judgment referred to the “availability of judicial review [of the fees] down the road,” and recognized, without explicitly adopting, the Commission’s argument that judicial review was available through Exchange Act Section 19(d) and (f).¹⁰ *NetCoalition II*, 715 F.3d at 352-53. The court stated that it took “the Commission at its word . . . that it will make the section 19(d) process available to parties seeking review of unreasonable fees charged for market data, thereby opening the gate to our review.” *Id.* at 353. The court also upheld *NetCoalition I*’s determination that a market-based approach requires “evidence that competition will in fact constrain pricing for market data,” stating that it remained “a controlling statement of the law.” *Id.* at 354.

Following *NetCoalition II*, SIFMA¹¹ filed an application under Exchange Act Section 19(d) challenging the 2010 ArcaBook Rule and alleging that the fees it imposed: (1) constituted a limitation on access reviewable under Exchange Act Section 19(d) and (f); (2) was unenforceable under Exchange Act Section 19(b)(3)(C) because it was not “fair and reasonable” and did not “protect investors and the public interest”; and (3) failed the Commission’s market-based approach because NYSE Arca had presented no evidence of being subject to significant competitive forces or its costs of collecting and distributing the data at issue. NYSE Arca Ex. 2 at 286. SIFMA also filed another application challenging numerous other SRO rules, including the 2010 Nasdaq Rule.¹²

On May 16, 2014, the Commission consolidated SIFMA’s challenges to the 2010 ArcaBook Rule and 2010 Nasdaq Rule into a single proceeding, which it then referred to me to

¹⁰ Exchange Act Section 19(d) allows “application by any person aggrieved” for review by the Commission of an SRO action that prohibits or limits “access to services offered by” the SRO, while 19(f) requires the Commission to review an SRO rule challenged under 19(d) and ensure the rule is “consistent with the purposes of this chapter” and does not “impose[] any burden on competition not necessary or appropriate.” 15 U.S.C. § 78s(d)(1)-(2), (f). In *NetCoalition II*, the Commission argued that Section 19(d) and (f) together allow “a party that is aggrieved by the fees . . . [to] challenge them as not consistent with the Exchange Act, including for not being ‘fair and reasonable.’” *NetCoalition II*, 715 F.3d at 352-53 (quoting Commission Br. at 46).

¹¹ NetCoalition had ceased to exist by the end of 2012. Jennifer Martinez, *NetCoalition winds down operations*, (Oct. 24, 2012, 2:35 PM), <http://thehill.com/policy/technology/263793-netcoalition-winds-down-operations>.

¹² Application for an Order Setting Aside Rule Changes of Certain Self-Regulatory Organizations Limiting Access to their Services, Admin. Proc. File No. 3-15351 (filed May 31, 2013).

designate an administrative law judge to preside over the consolidated proceeding. *SIFMA*, 2014 SEC LEXIS 1686, at *50-59. The Commission instructed that I first make “a determination of jurisdiction” under Exchange Act Section 19(d), and if I found jurisdiction, to then hold “additional record development and proceedings.” *Id.* at *50-52. After briefing from the parties, I determined that SIFMA had standing to pursue its challenges under Exchange Act Section 19(d). *SIFMA*, Admin. Proc. Rulings Release No. 1921, 2014 SEC LEXIS 3906 (ALJ Oct. 20, 2014). I then held a hearing from April 20 to April 24, 2015. The record consists of testimony from three fact witnesses and five expert witnesses. The Exchanges filed post-hearing briefs on June 8, 2015, SIFMA filed its opposition on July 20, 2015, and the Exchanges filed their reply briefs on August 3, 2015.

LEGAL STANDARD

The Commission directed me to “hold a hearing addressing whether the [2010 ArcaBook Rule and 2010 Nasdaq Rule] should be vacated under the statutory standard set forth in Exchange Act Section 19(f) – as informed by the two-part test set out in [the 2008 ArcaBook Order], the D.C. Circuit’s decision in *NetCoalition I*, and appropriate briefing from the parties.” *SIFMA*, 2014 SEC LEXIS 1686, at *52.

Exchange Act Section 19(d) authorizes the Commission “on its own motion, or upon application by any person aggrieved,” to review an SRO action that “prohibits or limits” any person “access to services offered by [the SRO].” 15 U.S.C. § 78s(d)(1)-(2). Subsection (f) describes the review process for an action, like this one, brought under Section 19(d). *See* 15 U.S.C. § 78s(f). Under that subsection, the legal inquiry in this proceeding is whether the Exchanges’ depth-of-book data fees are “consistent with” and “in furtherance of the purposes of” the Exchange Act; if they are not, the Commission “shall set aside the action of the [SRO]” *Id.* The Exchanges have the burden of establishing that the 2010 ArcaBook Rule and 2010 Nasdaq Rule are consistent with the Exchange Act. *SIFMA*, 2014 SEC LEXIS 1686, at *39 n.88.

In its 2008 ArcaBook Order, the Commission identified several provisions as specifying the purposes of the Exchange Act relevant to this matter; such provisions provide that the Exchanges’ fees for the non-core data must be fair and reasonable, and not unfairly or unreasonably discriminatory.¹³ *See* 15 U.S.C. §§ 78f(b)(4)-(5), (8), 78k-1(c)(1); 17 C.F.R. § 240.603(a)(1)-(2); 73 Fed. Reg. at 74779, 74782. The Commission determines this inquiry under a market-based approach:

- The Commission first “ask[s] whether the exchange was subject to significant competitive forces in setting the terms of” its fees. 73 Fed. Reg. at 74781.

¹³ As initially enacted, the Exchange Act had four basic purposes: to afford a measure of disclosure to people who buy and sell securities; to prevent and afford remedies for fraud in securities trading and manipulation of the markets; to regulate the securities markets; and to control the amount of the nation’s credit that goes into those markets. I Louis Loss, & Joel Seligman & Troy Parades, *Securities Regulation* 328 (4th ed. 2006).

- If this standard is met, the Commission will allow the fees to stand “unless it determines that there is a substantial countervailing basis to find that the terms nevertheless fail to meet an applicable requirement of the Exchange Act or the rules thereunder.” *Id.*
- If this standard is not met, “the Commission will require the exchange to provide a substantial basis, other than competitive forces, . . . demonstrating that the terms of the proposal are equitable, fair, reasonable, and not unreasonably discriminatory.” *Id.*

In *NetCoalition I*, the court upheld the Commission’s market-based approach, but directed that there must be sufficient evidence to meet the Commission’s standards. 615 F.3d at 533-35, 539-44.

FINDINGS OF FACT

The factual findings and legal conclusions are based on the entire record. I have considered and rejected all arguments and proposed findings and conclusions that are inconsistent with this initial decision.

There are approximately eleven securities exchanges operating today in the United States, split into four exchange “families.” Tr. 84; SIFMA Ex. 376 at 13565. Those families are: (1) the NYSE Group, which includes both the New York Stock Exchange and NYSE Arca;¹⁴ (2) Nasdaq, which also includes two smaller regional exchanges; (3) the BATS Global Markets Group;¹⁵ and (4) the Chicago Stock Exchange. SIFMA Ex. 376 at 13565. There are also a substantial number of alternative trading systems, which include dark pools.¹⁶ *Id.* at 13565 & n.2. Generally speaking, securities exchanges compete in a number of products and services, such as (1) listing services, (2) index services, (3) network and data center colocation services, and, most relevant to this proceeding, (4) trading services, and (5) data services. NYSE Arca Ex. 65 at 1551-53; Nasdaq Ex. 601 at 5.

There is fierce competition for trading services (or “order flow”). Tr. 1035-36; *see also NetCoalition I*, 615 F.3d at 539. The market for trading services is tremendously divided, and greater order flow makes an exchange’s depth-of-book data more valuable to customers. NYSE Arca Ex. 65 at 1551. At the end of 2014, when the market share of the alternative trading systems is included, no single exchange family accounted for even 25% of trading in U.S.

¹⁴ Despite belonging to the same exchange family, the New York Stock Exchange and NYSE Arca are separate exchanges. Tr. 84; SIFMA Ex. 376 at 13565.

¹⁵ The Commission approved a merger of BATS with Direct Edge, in 2014. Nasdaq Ex. 601 at 7. BATS owners include numerous SIFMA members. *Id.* at 8.

¹⁶ Dark pools are owned by exchanges, large brokerages, and independent companies. NYSE Arca Ex. 65 at 1559. Dark pools do not provide pre-trade market data, including depth-of-book data. *Id.* at 1558.

equities. Nasdaq Ex. 601 at 6. To attract order flow, most exchanges use a “maker-taker” fee structure, where rebates are paid to “makers” who create liquidity by posting orders to buy or sell, and fees are charged to “takers” who take that liquidity. SIFMA Ex. 376 at 13567. The rebates paid to attract order flow can be quite sizable; Nasdaq pays around seven hundred million dollars a year in “maker” rebates. Tr. 431-32.

Depth-of-book feeds

All the major exchanges, including the New York Stock Exchange, NYSE Arca, Nasdaq, BATS, and Direct Edge sell real-time depth-of-book data feeds.¹⁷ NYSE Arca Ex. 65 at 1548, 1576. Depth-of-book data is sold either for display use or non-display use. *Id.* at 1548. A display subscription allows an individual to view the depth-of-book data displayed on a monitor or device, such as a Bloomberg terminal. *Id.* Exchanges generally charge different display fees depending on whether the user is a professional or non-professional subscriber. *Id.* Professional subscribers are persons licensed or registered with a securities or commodities trading regulator or who provide investment advice or analysis, and non-professional subscribers are anyone else. *Id.* at 1548-49.

Non-display subscriptions allow for the use of depth-of-book data in computer applications such as market making, high-frequency trading, algorithmic trading, and the operation of dark pools. NYSE Arca Ex. 65 at 1549. Generally, non-display subscribers are smaller in number but account for a relatively large volume of orders on securities exchanges. *Id.* at 1550.

No one contested the representation that the pricing of depth-of-book data is uniformly applied to similarly situated subscribers. NYSE Arca Ex. 65 at 1548.

ArcaBook

NYSE Arca has one depth-of-book product, ArcaBook, which “provides, among other information, lists of all of the bids and offers placed on NYSE Arca, including those outside the prevailing market price, in a real-time data feed.” NYSE Arca Prehearing Br. at 8.

James Gilbert Brooks, III, testified on the history of ArcaBook and ArcaBook pricing; the types of customers who subscribe to ArcaBook; customer behavior in response to changes in ArcaBook pricing; and NYSE Arca’s efforts to maintain and grow their ArcaBook customer base. Specifically, he testified that ArcaBook is delivered to customers either through a direct feed or by distributors, such as Bloomberg.¹⁸ Tr. 108. The direct feed is for institutional, rather

¹⁷ New York Stock Exchange offers a depth-of-book feed called NYSE OpenBook. Nasdaq Ex. 601 at 13. NYSE Arca offers ArcaBook. *Id.* Nasdaq depth-of-book data feeds include Nasdaq TotalView and OpenView. NYSE Arca Ex. 65 at 1548 n.28. Direct Edge offers EdgeBook Depth and EdgeBook Attributed, and BATS also offers a depth-of-book feed. *Id.*; Nasdaq Ex. 601 at 13.

¹⁸ Brooks is senior director and head of proprietary market data at the New York Stock Exchange. Tr. 18-19. He graduated from the University of Virginia with a degree in economics,

than individual, subscribers, because the direct feed is a “fire hose” of two hundred to three hundred million orders a day, intended to be read by machines and requiring substantial investments in infrastructure and bandwidth. Tr. 26, 29-30. There are fewer than two hundred subscribers for ArcaBook’s direct feed, and these are usually very large, sophisticated organizations. Tr. 48-49. Distributors, like Bloomberg, take the ArcaBook feed and turn it into a visual display that humans can read. Tr. 29-30.

NYSE Arca charges a variety of fees for ArcaBook depending on the customer and the intended use. It first began charging for ArcaBook in January 2009. Tr. 65; NYSE Arca Ex. 65 at 1565. NYSE Arca’s filing fee from November 2010, which is the subject of this proceeding, imposed a \$750 per month access fee, which permitted a subscriber to receive the raw data feed from NYSE Arca and use it without limits internally. Tr. 35-36. The rule change also imposed a display fee, which allows a subscriber to view ArcaBook on a display device from a vendor like Bloomberg, after that vendor had converted the raw ArcaBook feed into something readable. Tr. 36-37. For a listing of all securities, the display fee was \$30 for professional subscribers and \$10 for nonprofessionals. Tr. 37-38, 40. Since November 2010, NYSE Arca has imposed additional fees for non-display uses as well as a redistribution fee. Tr. 43-44. Some of the already existing fees have also increased since 2010. *See generally* Tr. 130-34; SIFMA Exs. 81, 93, 380. When NYSE Arca first began charging for ArcaBook, the number of direct feed subscribers fell from 220 to around 170, and the number of professional display subscribers declined from 29,636 to 29,133. Tr. 90-92.

When setting fees for ArcaBook, Brooks and his team examine the market and competing products to determine a fair price, which is often lower than what he thinks the product is actually worth because he is worried about customers canceling. Tr. 65-66. Brooks considers Nasdaq’s TotalView and the BATS depth-of-book products to be ArcaBook’s competitors, and stated that they compete in price and in features offered. Tr. 63-65. NYSE Arca deliberately tries to price its products to prevent customer attrition. Tr. 143. Brooks is also aware that in response to an ArcaBook price increase, clients may drop ArcaBook or route their order flow elsewhere. For example, BlueFin Trading, a former subscriber, dropped ArcaBook because of a price increase. Tr. 71-73. Lime Brokerage and Pico Trading also made threats to shift order flow elsewhere in response to a price increase for ArcaBook. Tr. 73-75. NYSE Arca also instituted a tiered pricing structure to placate the concerns of ██████████, a large customer. Tr. 75-77. However, the only customer Brooks could identify that actually dropped ArcaBook in response to a price increase is BlueFin, and Brooks admitted that he had never heard of BlueFin until they dropped ArcaBook. Tr. 93, 112, 135. Brooks was also unable to identify any customer that switched from ArcaBook to Nasdaq’s TotalView or vice versa. Tr. 137-38. However, Brooks also testified that he would not be aware of customer switching depth-of-book products unless that customer specifically told him. Tr. 159-60.¹⁹

and prior to his work at the New York Stock Exchange, Brooks worked at Nasdaq OMX. Tr. 20. Brooks’s current position involves proprietary data in all phases: product development, the release of new products, the enhancement of existing products, and marketing of proprietary data products. Tr. 19.

¹⁹ Brooks testified that NYSE Arca does not track costs that are solely attributable to the ArcaBook product. Tr. 47. I find unpersuasive SIFMA’s contention that NYSE Arca’s

Nasdaq's depth-of-book products

Nasdaq has three depth-of-book products: TotalView, Open View, and Level 2. TotalView displays every bid and every offer for all market participants listed on Nasdaq. Tr. 402. OpenView provides the same information, but for stocks listed on other exchanges besides Nasdaq. Tr. 405-06. Level 2 “provides information on the best price quoted by each market participant, but does not include every price quoted by each participant.” Nasdaq Ex. 601 at 9. Nasdaq considers Level 2 a subset of Total View. Tr. 403.

Oliver Albers testified that Nasdaq sells over ninety data products and the data products department accounts for 19% of Nasdaq's total revenue.²⁰ Tr. 389, 391. Albers admitted that data products is one of Nasdaq's most profitable units, with profit margins between 70 and 80%, though he said that was partially due to the way Nasdaq allocated costs. Tr. 545. Nasdaq views its data products as a source of competitive advantage – in that it can drive order flow and add value to clients. Tr. 391. Nasdaq's biggest customers for depth-of-book data products are data vendors and retail brokers. Tr. 399. Retail brokers typically only buy one, maybe two, depth-of-book products. Tr. 399. Albers testified that this was because the retail brokers only needed one depth-of-book product, and sometimes, not even that; he believes that some might use it as a marketing tool. Tr. 400.

Nasdaq considers the NYSE and BATS exchange families among its competitors for the sale of data products. Tr. 392-93, 477-79. Albers and his team have created internal documents identifying and comparing Nasdaq and their competitors' depth-of-book products; he testified that he would not have created such documents and he probably would not be employed if, as SIFMA claims, investors were required to purchase all depth-of-book data. Tr. 413-15; SIFMA Ex. 133 at 610, 623. Nasdaq and Albers were concerned that a Direct Edge and BATS merger would create a powerful competitor in the data products market. Tr. 417; SIFMA Ex. 133 at 623.

Before deciding on a price for its depth-of-book data, Albers and his team run through various scenarios to determine potential attrition and revenue loss from customers either dropping Nasdaq's product entirely or switching to a competitor's product. Tr. 415-16; SIFMA Ex. 133 at 612. They also attempt to understand how each individual client will react, and will

statements on this point “contradict[] its prior representations to the Commission that its ‘market data revenues compare favorably to the markets’ cost of producing the data.’” *See* SIFMA Br. at 49-50. The two are not necessarily mutually exclusive. In any event, as I place little weight on cost and profit margin data for the reasons set forth in my legal conclusions, this issue is of minimal relevance.

²⁰ Albers has been at Nasdaq for fifteen years, and is currently the global head of sales in Nasdaq's data products department. Tr. 383-84. He graduated from Ohio University and has an M.B.A. from George Washington University. Tr. 671. Albers spends almost half his time visiting clients and trying to sell them Nasdaq's data products; he also supervises sixteen salespersons located in six cities across the globe. Tr. 387.

also consult with their transactions and listing groups, because they are aware that a pricing change to depth-of-book products may lead to angry customers shifting order flow away from Nasdaq. Tr. 496-97. His team also reach out to customers in advance of a pricing decision to get feedback on their pricing changes – they even go in front of SIFMA’s market data committee twice a year to discuss their pricing changes. Tr. 497.

Albers testified that Nasdaq’s depth-of-book products are marketed aggressively “[b]ecause it’s a very highly competitive market, and we’re trying to further our business in any way we can.” Tr. 438; *see also* Tr. 430. Nasdaq spends around one million dollars advertising its data products, two million dollars a year on research and development of depth-of-book products, and actively works on creating and improving products that respond to client needs. Tr. 392, 394, 419, 483-90. Nasdaq also has created numerous advertisements and marketing programs to persuade potential clients to switch from other exchanges’ products, or to upgrade from Nasdaq’s basic Level 2 to the more comprehensive TotalView product. Tr. 407, 419-30, 432-33, 436-38, 490-92; SIFMA Exs. 118, 121, 122, 124, 127-29. Nasdaq also mulled a proposal where a client would receive a discount on market data in exchange for routing more order flow to Nasdaq, though the proposal was rejected by the Commission. Tr. 433-36; SIFMA Ex. 123. In addition to heavy advertising efforts, Albers and his sales team kept close watch on his competitors’ actions. Tr. 439-40, 473-77; Nasdaq Exs. 509, 515. He and his team also compiled a list of reasons given by customers who declined to purchase TotalView. Tr. 446; Nasdaq Ex. 511 at 36-37. Some of those reasons were that core data and/or Level 2 data were sufficient, or that the depth-of-book data from NYSE Arca or BATS/Edge was sufficient and cheaper. Nasdaq Ex. 511 at 36.

Nasdaq has 350,000 professional subscribers to its data products, which includes core data. Tr. 408-09. Of those 350,000 professional subscribers, 85,000 get some type of depth-of-book product from Nasdaq; of those, 30,000 receive TotalView. Tr. 409. Of those 30,000 subscribers, 5,000 subscriptions are for servers rather than human beings, and those servers are all operated by around one hundred firms. Tr. 410. Those one hundred firms conduct upwards of 90% of all trading on Nasdaq. Tr. 450. Because order flow is Nasdaq’s “life blood,” this gives those one hundred firms “the upper hand in almost all of [the] negotiations.” Tr. 450-51, 540-41. These one hundred firms’ power is especially pronounced because, at many of them, the person who Nasdaq negotiates with about depth-of-book pricing is also responsible for determining whether order flow is routed to Nasdaq. Tr. 542-43; Nasdaq Ex. 527 at 269.

Albers testified that he has had clients switch from Nasdaq’s depth-of-book product to another exchange’s depth-of-book product and that that he has discussions “all the time” with clients who threaten to move order flow in response to depth-of-book pricing. Tr. 386, 443. In fact, some of Nasdaq’s customers have infrastructure which allows them to easily switch back and forth, on a monthly basis, between various exchanges’ depth-of-book data, based on market share and pricing changes. Tr. 443. The risk of customers switching to other depth-of-book products or routing order flow away in response to high prices for depth-of-book data is a serious risk that Albers’ team has presented to Nasdaq’s management. Tr. 492-96; Nasdaq Ex. 524 at 193. An internal document from 2006, “NASDAQ Market Data,” states that “[m]arket data is currently an extremely competitive environment that affects all aspects of NASDAQ’s business

model,” with “numerous competitors currently vying for what tends to be a finite pool of funds allocated to market data consumption.” Nasdaq Ex. 524 at 193.

██████████ is an example of a client that routed order flow elsewhere because of Nasdaq’s depth-of-book fee increases. Tr. 503-04. In 2012, Nasdaq sought to introduce new tiers of pricing for direct access non-display use of its depth-of-book data. Tr. 505-06; Nasdaq Ex. 505 at 16-17. ██████████ representative was furious with the new prices, claiming that Nasdaq placed a “false valuation” on its depth-of-book data, and that the valuation “will dissipate quickly as we begin pulling orders away from NASDAQ to other exchanges This simple relationship between market data and order flow should resonate.” Nasdaq Ex. 505 at 13. ██████████ followed up on this threat, routing significant order flow away from Nasdaq, and Nasdaq became so concerned that it began to involve several senior executives. Tr. 510-12; Nasdaq Ex. 506. ██████████ also reduced its number of servers subscribed to Nasdaq’s depth-of-book data. Tr. 512-14; Nasdaq Ex. 507. Despite ██████████ actions, Nasdaq did not budge with its pricing. Tr. 640-41. ██████████, a software company that assists firms with facilitating trading, is another example of a significant customer that threatened to drop all Nasdaq depth-of-book products in response to a price increase. Tr. 514-17; Nasdaq Ex. 508. Nasdaq also tried to induce more order flow from ██████████ by offering to cap their market data fees at a lower level in exchange for more trade execution. Tr. 517-26; Nasdaq Exs. 502, 503, 504. While that effort was ultimately unsuccessful, Nasdaq successfully placated another customer, Hudson River Trading, with a fee cap. Tr. 529-34; Nasdaq Ex. 501.

Lee Shavel, the chief financial officer at Nasdaq OMX Group, testified that his company enjoyed a 70-75% profit margin on market data products, but explained it was that high because of the way it allocated certain joint costs to various business segments.²¹ Tr. 1334, 1337. Shavel also testified that depth-of-book data were “crucial” for a category of large and sophisticated market professionals, such as banks, market makers, and algorithmic traders. Tr. 1344. These entities are big customers of depth-of-book data and also are responsible for around 90% of Nasdaq’s order flow. Tr. 1347-57. SIFMA does not dispute that a small group of traders account for a tremendous share of order flow, up to 90% of trades executed on Nasdaq’s platform. Tr. 1014, 1034; *see also* Tr. 450.

EXPERT TESTIMONY

Terrence Hendershott and Aviv Nevo for NYSE ARCA

Terrence Hendershott, Ph.D., and Aviv Nevo, Ph.D., opined on behalf of NYSE Arca as to whether competitive forces discipline and constrain NYSE Arca’s pricing of ArcaBook.²²

²¹ Prior to joining Nasdaq OMX Group, Shavel was a managing director in Bank of America and Merrill Lynch’s investment banking group, where he specialized in covering stock exchanges. Tr. 1334.

²² Hendershott is a professor at the Haas School of Business at the University of California, Berkeley, with an expertise in management of information systems and the role of information technology in financial markets and electronic communications networks and stock exchange design. NYSE Arca Ex. 65 at 1537. Nevo is a professor in the department of economics at

NYSE Arca Ex. 65 at 1539. Hendershott and Nevo submitted a joint report: Hendershott was primarily responsible for conclusions about the nature and industry use of depth-of-book data, and Nevo was primarily responsible for the economic analysis of pricing and competition in the depth-of-book data market. *Id.* at 1539, 1545, 1550, 1559.²³ Hendershott and Nevo conclude that competition for order flow and depth-of-book data imposes significant competitive restraints on NYSE Arca's pricing of ArcaBook. *Id.* at 1543. In support of their position, they assert and conclude that:

Over the last decade, a large number of exchanges and alternative trading systems have captured significant trading volume from the NYSE Group and NASDAQ.

Individual exchanges do not maintain an exclusive hold on trading in a particular security.

Economic theory demonstrates that a negative relationship exists between order flow and the price of depth-of-book data. In other words, competition for order flow disciplines and constrains the price of depth-of-book data.

NYSE Arca sets ArcaBook prices to maximize joint profits from multiple exchange products. This is consistent with multiproduct firm pricing that seeks to optimize joint profits from the sale of two complementary products, namely, transaction services and depth-of-book data. Supporting this proposition are the declines in both ArcaBook subscriptions and NYSE Arca trading volume when ArcaBook prices increased, as well as the pricing of ArcaBook in the inelastic region of the demand curve.²⁴

Northwestern University and a professor of marketing at Northwestern's Kellogg School of Business. *Id.* at 1538. Nevo served as a deputy assistant attorney general for economic analysis in the Antitrust Division at the United States Department of Justice in 2013-2014, and his expertise includes empirical industrial organization, competition economics, and econometrics. *Id.*

²³ The exhibit consists of a forty-four page report, Exhibits 1-8, and Appendices A-D.

²⁴ Here, price elasticity of demand measures the percentage decrease in quantity demanded in response to a 1% change in price. NYSE Arca Ex. 65 at 1568 n.88. Demand is elastic if quantity demanded decreases by more than 1% in response to a 1% increase in price, and inelastic if quantity demanded decreases by less than 1%. *Id.* In other words, if demand is elastic, revenues decline in response to a price increase and if demand is inelastic, revenues increase in response to a price increase. *Id.* Pricing ArcaBook in the inelastic region of the demand curve would cause an increase in revenue when the price is increased because the increase in revenue from charging a higher price is greater than the decreased revenue from selling fewer units. *See generally id.* at 1568-69; NYSE Arca Ex. 86. By contrast, if NYSE Arca priced ArcaBook in the elastic portion of the demand curve, a price increase would reduce overall revenue because the loss in revenue from decreased unit sales is greater than the gain in revenue from higher unit prices. *See generally* NYSE Arca Ex. 65 at 1568-69; NYSE Arca Ex. 86.

Many customers buy one depth-of-book product and switch to another one over time.

Trading for nearly all stocks is unconcentrated or moderately concentrated and traders can obtain depth-of-book data information about a particular stock from competing depth-of-book products offered by different exchanges.

Economic theory and empirical evidence shows that competing depth-of-book data products contain similar information.

Id. at 1543-44.

Hendershott opined²⁵ that depth-of-book data are directly implicated in only a small share of trades—3.3% according to one article—that occur outside the NBBO. NYSE Arca Ex. 65 at 1548. For the remaining 96.7% of trades, which occur at or within the NBBO, depth-of-book data are not necessary. *Id.* Thus, his opinion is that most market participants do not need depth-of-book data to trade, but such data would be useful for a trader seeking to fill a large order, and can help a trader decide whether to submit a limit order or a market order to trade immediately. *Id.* at 1546-47. For example, high-frequency traders and other market participants with sophisticated trading strategies use depth-of-book data. *Id.* at 1547. According to Hendershott, high-frequency traders and other subscribers of non-display data account for a relatively large volume of orders on the exchanges, and therefore have bargaining power relative to the exchanges that provide depth-of-book data. *Id.* at 1550.

Hendershott claimed that stock exchanges compete across a variety of different products and services, including index and listing services. NYSE Arca Ex. 65 at 1551-52. They also compete in order execution, which accounts for the majority of their revenue, where traders pay a per-share fee for orders that *take* liquidity (execute against existing orders in the exchange's order book), and receive a rebate for orders that *make* liquidity (add to exchange's order book). *Id.* at 1552-53. And they compete in data services, such as the sale of core and non-core data. *Id.* at 1552-53. According to Hendershott, the exchanges seek to maximize their profits across all their products and services, and because these products are all complementary goods, an increase in the price of one good may reduce the revenue from another product. *Id.* at 1553-54. Also, when pricing its data services, an exchange will worry that a too-high price will damage revenue from their main business of order execution. *Id.* at 1554. For a variety of reasons, competition from new entrants, especially for order execution, has increased dramatically over the last decade. *Id.* at 1554-59.

Hendershott represented that New York Stock Exchange and NASDAQ accounted for approximately 75% of equity trading volume in early 2007, but that is no longer true. NYSE Arca Ex. 65 at 1558. In 2014, New York Stock Exchange and NASDAQ each handled less than 20% of trading volume; BATS and DirectEdge captured some of that trading volume, but electronic trading platforms and other alternative trading systems captured the largest share from

²⁵ I will refer to each expert individually, rather than collectively, when discussing the assertions made in their respective sections of the report.

the incumbent exchanges. *Id.* at 1558, Ex. 2. Hendershott represented that available data showed fifty dark pools trading domestic equities, and the nineteen for which data were available accounted for 14% of consolidated volume in 2013. *Id.* at 1559. Hendershott opined that the proliferation of dark pools is clear evidence that low barriers to entry provide competitive discipline to the U.S. exchange industry. *Id.* at 1559.

Nevo argued that competition between securities exchanges places downward pricing pressure on depth-of-book data products and that the existence of substitutes to ArcaBook constrains NYSE Arca's ability to set supracompetitive prices. NYSE Arca Ex. 65 at 1560. Nevo concluded that competing depth-of-book products offered by NASDAQ, New York Stock Exchange, and others constrain depth-of-book product prices. *Id.* at 1560, 1570.

Nevo explained that new entrants have taken substantial market share in order flow from incumbent exchanges. NYSE Arca Ex. 65 at 1560. As a result, NYSE Arca must keep its prices for its products and services low, including for depth-of-book data, in order to compete. *Id.* at 1560-61. To demonstrate the competition between exchanges for order execution, and to rebut SIFMA's claim that the trading volume for particular shares may be concentrated at a single exchange, Nevo calculated the Herfindahl-Hirschman Index (HHI)²⁶ for the trading volume across exchanges for all stocks and exchange traded funds traded in November 2014.²⁷ *Id.* at 1561. Nevo found that the aggregate HHI is 1,362, which he claimed met the DOJ's definition of an unconcentrated market. *Id.* at 1562. Nevo further found that for 90% of stocks, trading volume is unconcentrated or moderately concentrated with HHIs under 2500, and the remaining 10% of stocks with concentrated trading volumes are more likely to be small-cap stocks that are rarely traded. *Id.* at 1562-63. Nevo claimed that the lack of concentration in trading volume is proof that competition disciplines exchange fees through the potential loss of order flow and trading volume. *Id.* at 1564. He reasoned that the same is true of depth-of-book fees as well: if they increase, they drive up the cost of trading at an exchange, thus causing participants to shift their order flow elsewhere. *Id.*

To test out his theory, Nevo conducted an experiment, focusing on January 2009, when ArcaBook changed from being free to "significant[ly]" increasing its price.²⁸ NYSE Arca Ex. 65 at 1565. Nevo sought to measure the impact the price increase had on NYSE Arca's share of trading volume. *Id.* at 1566. He concluded that as a result of the ArcaBook fee, NYSE Arca lost

²⁶ HHI is a standard measure of industry concentration, ranging from near zero (low concentration) to 10,000 (complete concentration in one venue). NYSE Arca Ex. 65 at 1561.

²⁷ Nevo computed HHI values by exchange owner rather than by exchange because several exchanges have the same owner. *Id.* at 1562.

²⁸ The new fee structure included a monthly per-customer access fee, a monthly per-subscriber device fee, and a fee cap for non-professional users. NYSE Arca Ex. 65 at 1565. After the new fees were implemented, subscriber accounts declined from 3,787 to 3,594 and the number of professional subscribers declined from 29,636 to 29,133. *Id.* at 1569. Because the percentage change in subscribers was substantially smaller in magnitude than the percentage change in price, Nevo concluded that demand for ArcaBook at 2009 prices was inelastic. *Id.* at 1569.

a “statistically significant” 2.4% of market share in trading volume versus other traditional exchanges and 2.1% versus the rest of the market (including dark pools). *Id.* at 1566-67. Nevo also stated that NYSE Arca is pricing its depth-of-book product on the inelastic demand curve. *Id.* at 1568-69. This shows that it is not maximizing its profits from the depth-of-book data, because inelastic demand means that NYSE Arca could increase revenues by increasing the price of depth-of-book data. *Id.* at 1568. But Nevo claimed that ArcaBook’s pricing is consistent with the conduct of a firm seeking to maximize joint profits from a portfolio of products, and is further proof that competition for order flow constrains the pricing of depth-of-book data. *Id.* at 1569-70. Nevo explained that because order flow and depth-of-book data have a complementary relationship, an increase in the price of ArcaBook would dramatically curtail order flow, leading to a loss of overall revenue, which is why ArcaBook is priced on the inelastic demand curve. *Id.* at 1568-70.

Nevo also claimed that the pricing of depth-of-book products is constrained by competitor products offered by other exchanges. NYSE Arca Ex. 65 at 1570. He examined 114 entities that purchased Nasdaq depth-of-book data in the ninety-four months from January 2007 to October 2014. *Id.* at 1572. By comparing those subscriber names to the names on customer sheets for NYSE Arca’s ArcaBook and New York Stock Exchange’s OpenBook depth-of-book product, Hendershott and Nevo concluded that: those subscribers also purchased ArcaBook and OpenBook in 54% of months; also purchased either ArcaBook or OpenBook in 21% of months; and did not purchase either ArcaBook or OpenBook in 25% of months. *Id.* at 1572-73, Ex. 7.

Nevo also identified numerous Nasdaq depth-of-book subscribers who either never subscribed to ArcaBook or at some point dropped ArcaBook. NYSE Arca Ex. 65 at 1574-75. Nevo claimed this data show that few entities are required to purchase all depth-of-book data from every exchange, and that most entities can and do switch between depth-of-book products, perhaps in response to price changes. *Id.* at 1575. Nevo further argued that depth-of-book information is mostly correlated across the exchanges, allowing traders to buy a depth-of-book product from one exchange and use it to forecast the depth-of-book at other exchanges. *Id.* at 1577-78.

Nevo found no evidence that the marginal cost of ArcaBook could be determined and characterized the use of marginal cost as an indication of a competitive market as misguided. NYSE Arca Ex. 65 at 1578. In his opinion, the true measure of competitiveness in the market for depth-of-book data is whether there are barriers to entry. *Id.* at 1580.

Hendershott and Nevo were also offered as rebuttal witnesses to SIFMA’s experts Bernard S. Donefer and David S. Evans. Tr. 164, 273-74. In rebuttal, Hendershott and Nevo agreed with SIFMA’s expert Evans that the Exchanges are “multi-product” platforms that compete in selling proprietary data products and trade executions, and that a sale of one product impacts the decision to buy the other. Tr. 166-67, 274-75. But Hendershott disagreed with Evans that the exchanges are both “multi-product” and “multi-sided” platforms.²⁹ Tr. 167.

²⁹ According to Evans, the exchanges are multi-sided platforms because they act as intermediaries between buyers and sellers of equity. SIFMA Ex. 377 at 13683-84. Evans

Hendershott disputed SIFMA expert Donefer's findings that most traders need depth-of-book data. Tr. 170-71. Hendershott again cited the fact that 96.7% of trades occur at the NBBO prices that are provided by core data. Tr. 170-72. Hendershott conceded that depth-of-book data may be useful to certain market participants, such as high-frequency traders or traders who rely on algorithmic computer models, and that depth-of-book data would allow traders to see the supply and demand for a particular security. Tr. 224-27, 229.

Hendershott also disputed Donefer's assertion that depth-of-book products are not substitutes for each other by referencing a study in his expert report, showing that out of 120 Nasdaq depth-of-book customers, only about half also subscribed to the depth-of-book products from NYSE Arca and New York Stock Exchange.³⁰ Tr. 173-78. Hendershott also disagreed with Donefer's assertion that the duty of best execution required market participants to purchase depth-of-book data, because only broker-dealers have that duty, but he conceded that depth-of-book data would help some broker-dealers meet their best execution duty. Tr. 193-94, 236-37.

Hendershott did not agree with Donefer's assertion that traders need depth-of-book data to participate in open and closing auctions. Tr. 191. Only traders who wish to trade on an order imbalance need depth-of-book imbalance data, and this strategy is done only by a very few sophisticated entities. Tr. 191-93. Hendershott responded to Evans's criticism that Hendershott's regression analysis, which showed that NYSE Arca's relative share of the trading market declined when it began charging for NYSE Arca, failed to account for other factors that could explain for NYSE Arca's diminished share of the trading market, including the entry of BATS as a securities exchange. Tr. 202-03. Hendershott stated that these criticisms were misplaced because in one regression he controlled for overall market volume. Tr. 203.

Nevo disagreed with Evans's assertion that the Exchanges keep depth-of-book prices high to cross-subsidize low prices for order flow. Tr. 278-79. According to Nevo, Evans's customers who buy depth-of-book data are large and sophisticated entities with an outsized portion of trading volume, and can discipline the Exchanges if depth-of-book pricing gets too high. Tr. 308-09. Nevo agreed with Evans that NYSE Arca priced its depth-of-book product on the inelastic demand curve, but, according to Nevo, that pricing demonstrated that depth-of-book data fees were constrained by fear of losing order flow. Tr. 309-15; NYSE Arca Ex. 86.

Nevo testified that Evans's criticisms of the regression analysis in Hendershott and Nevo's expert report relied on a theory of perfect competition, which is unrealistic. Tr. 281-82. According to Nevo, in the real world, the fact that a company raised prices and lost some customers does not demonstrate that the company has market power sufficient to raise an antitrust concern. Tr. 282-83. Nevo also criticized Evans's position that order flow competition

argued, and Nevo disputes, that as a result of this structure, the exchanges price depth-of-book products higher and cross-subsidize order flow. *Id.* at 13684-85; Tr. 277-78.

³⁰ Hendershott concluded that not every customer needs depth-of-book data, much less *all* depth-of-book data from all exchanges. Tr. 178-79, 182-83; NYSE Arca Ex. 87.

is correlated with an increase in depth-of-book data prices, and argued that Evans confused correlation with causation. Tr. 283-84.

Nevo defended his analysis showing that around 90% of shares that trade on Nasdaq also trade on NYSE Arca, and vice versa. Tr. 292-93; NYSE Arca Ex. 83. Nevo explained that the 90% of shares that trade on both Exchanges account for almost 100% of trading by volume, so the 10% of stocks that are concentrated on a particular exchange are small stocks that rarely trade. Tr. 293-95. Nevo also responded to criticisms of his HHI analysis, including Donefer's contention that measuring concentration on a monthly basis does not comport with the fact that traders make decisions at fractions of a second, by arguing that the only way to conduct an HHI analysis was across a longer and more meaningful time period such as a month. Tr. 295-99. Nevo also testified that cost and profit margins of depth-of-book data are difficult to calculate and that it would be unrealistic to expect or require them to equal each other, which occurs only in a model of perfect competition. Tr. 301-05.

Nevo defended the analysis showing that, out of 120 random Nasdaq depth-of-book customers, only about half of them also bought depth-of-book data from NYSE Arca and New York Stock Exchange. Tr. 320-22; NYSE Arca Ex. 65 at Ex. 7; NYSE Arca Ex. 82. Nevo admitted, however, that 75% of customers who purchased Nasdaq depth-of-book data also purchased another exchange's depth-of-book data product.³¹ Tr. 336-37; NYSE Arca Ex. 65 at Ex. 7; NYSE Arca Ex. 82. Nevo also admitted that when NYSE Arca first imposed fees for ArcaBook, it only lost 2% of professional and 5% of non-professional subscribers. Tr. 359-60. Furthermore, Nevo admitted that while his regression analysis showed that NYSE Arca's share of trading volume declined in January 2009 when it began charging for ArcaBook, Nasdaq and New York Stock Exchange's share of trading volume also declined during that time. Tr. 371-72; NYSE Arca Ex. 65 at Ex. 2.

Janusz A. Ordover for Nasdaq

Janusz A. Ordover presented expert testimony on behalf of Nasdaq.³² Nasdaq Ex. 601.³³ Ordover focused on whether the existence of alternatives to depth-of-book data and order flow competition constrained Nasdaq's prices for depth-of-book data. *Id.* at 3-4. Initially, Ordover addressed issues raised in the 2008 ArcaBook Order and in *NetCoalition I*. He concluded: (1)

³¹ The study included only those Nasdaq customers who purchased their data directly from Nasdaq, and not Nasdaq customers who received their depth-of-book data from a redistributor. Tr. 344-49. Nevo concluded, without supporting evidence, that customers switched between depth-of-book products, and even if Nevo had evidence he would not be able to conclude that the switch was as a result of a price change. Tr. 350-54.

³² Ordover has been a professor of economics at New York University since 1973 and served as a deputy assistant attorney general for economics at the Antitrust Division of the U.S. Department of Justice from 1991-1992. Nasdaq Ex. 601 at 2. Ordover's expertise includes the pricing of information and the costs and benefits of regulatory interventions in markets. *Id.*

³³ The exhibit consists of a thirty-one page report and Attachment 1.

Nasdaq was subject to significant competitive forces in setting fees for depth-of-book data; (2) traders have competitive alternatives to Nasdaq depth-of-book data; (3) economic evidence shows that order flow competition constrains Nasdaq's depth-of-book data prices; and (4) from an economic perspective, a market-based approach to pricing is likely to lead to greater efficiency and enhanced consumer welfare. *Id.* at 3.

As an expert in the economics of competition, including antitrust and regulation, Ordovery testified that products like ArcaBook and Nasdaq's depth-of-book offerings do not have to be absolutely identical for them to compete in the same market. Tr. 675, 685-86. Ordovery also testified that the mere fact that NYSE Arca and Nasdaq had exclusive control over their depth-of-book data did not mean they were not competitors. Tr. 686. In fact, Ordovery testified that it is very common for a business to have "exclusive control" over their information in the data business or content industries. Tr. 686. Ordovery stated that Nasdaq's efforts to innovate and market its depth-of-book products suggested it faced significant competitive forces. Tr. 689-90.

According to Ordovery, exchanges like Nasdaq and NYSE Arca compete on a variety of products and services, and the rapid rise of BATS, Direct Edge, and the substantial increase in OTC trading, including dark pools, indicate there are no substantial barriers to entry or expansion in the business of trading equities. Nasdaq Ex. 601 at 6. Ordovery claimed that over the past six years, Nasdaq's and NYSE Arca's share of trading volume has fallen from 32 to 17% and 17 to 11%, respectively, and that at the end of 2014 no single trading platform accounted for even 25% of trading volume. *Id.* at 6.

Ordovery argued that significant competition between Nasdaq's depth-of-book products and those of other exchanges constrains prices. Nasdaq Ex. 601 at 9-10. Ordovery cited Nasdaq's continual improvement and innovation in its depth-of-book products as evidence of Nasdaq's efforts to improve its competitive standing. *Id.* at 9-10. Ordovery also cited efforts by Nasdaq and its competitors to undercut each other to gain market share in depth-of-book products. *Id.* at 10-11. Ordovery conceded that not every exchange's depth-of-book product is identical, but maintained that the substantial overlap in quality of data can effectively constrain prices, comparing it to Coke and Pepsi, two products that are not identical yet constrain each other's prices. *Id.* at 13.

Ordovery testified that Nasdaq gained and lost a substantial number of depth-of-book customers in every year during the period between 2008 and 2014. Nasdaq Ex. 601 at 14. In this time period, annual churn rates on Nasdaq's depth-of-book products were between 23 and 41%.³⁴ *Id.* at 14-15. Moreover, customers can, and do, put pressure on Nasdaq's pricing by increasing or decreasing their subscriptions to depth-of-book data. *Id.* at 15-16. Based off this data, Ordovery concluded that significant numbers of Nasdaq's customers can drop its depth-of-book products, or reduce their usage, if Nasdaq priced those products too high. *Id.* at 16. Ordovery testified that a churn analysis demonstrated that customers can and do switch from one depth-of-book supplier to another, that Nasdaq's depth-of-book product is not essential, and that

³⁴ Ordovery calculated the churn rate as the sum of annual customer additions and losses divided by the total number of customers in that year. Nasdaq Ex. 601 at 15 n.37.

not every customer needs depth-of-book product from all exchanges. Tr. 695-97, 701; Nasdaq Ex. 601 at 15.

Ordover acknowledged that his churn analysis did not account for customers who stopped purchasing depth-of-book data from Nasdaq directly but instead received it from a redistributor. Tr. 698-99, 766-68. Ordover believed it unlikely that many customers would choose to receive depth-of-book data from a redistributor because it would be slower and more expensive; however, he admitted that he is unaware of the actual percentage of customers who switched to redistributors. Tr. 699-700. In response to Evans's criticism that he had cited few examples of customers switching, Ordover put forward around thirty examples of customers switching between depth-of-book products, though he admitted that for those examples, he did not know whether customers dropped Nasdaq or simply switched to a redistributor. Tr. 702, 777-79.

Ordover testified that competition for order flow constrains Nasdaq's depth-of-book prices, citing ██████, which, displeased with a price increase in Nasdaq's depth-of-book product, threatened to, and eventually did, route significant order flow away from Nasdaq. Nasdaq Ex. 601 at 19-20. Ordover also cited another example where, in a bid to attract more order flow, Nasdaq lowered market data fees for a customer. *Id.* at 20-21. Ordover acknowledged that ██████, a company that had threatened Nasdaq in response to a depth-of-book price increase, was still a Nasdaq depth-of-book customer, even though the fees ██████ had complained about had been raised again. Tr. 760-63. Ordover admitted that Nasdaq did not reduce its price in response to the ██████ order flow threat and that ██████ still buys depth-of-book data from Nasdaq. Tr. 799.

Ordover disputed SIFMA's arguments that Nasdaq depth-of-book prices had continuously increased, but even if they had, he contended that it was not evidence of a lack of competitive forces in the marketplace. Tr. 704-07. In Ordover's opinion, the only material fee increase for Nasdaq's depth-of-book products was the increase for the non-display direct feed, which only affected high-frequency traders. Tr. 708-09.

Ordover agreed with Donefer that 80% of Nasdaq's depth-of-book customers also bought ArcaBook. Tr. 712-13. However, Ordover argued that those numbers showed depth-of-book data were not essential, since 20% of Nasdaq's customers did not subscribe to ArcaBook. Tr. 713. Also, he contended that among Nasdaq's depth-of-book customers, over 51% are only purchasing TotalView, meaning half of its customers are not purchasing Nasdaq's full depth-of-book service. Tr. 713-15. Ordover testified that the only customers who absolutely need depth-of-book data from all the exchanges are customers such as algorithmic and high-frequency traders, who are a small proportion of the overall total of customers, but who exert enormous power over the Exchanges because they represent a gigantic percentage of the trading market. Tr. 716-18. Ordover criticized SIFMA's argument that broker-dealers needed to purchase depth-of-book data to meet their best execution obligations, citing a lack of evidence. Tr. 719-20.

Ordover disputed SIFMA's claim that the reasonableness of an exchange's depth-of-book fees can be determined from the cost incurred in collecting and distributing the depth-of-book data. Nasdaq Ex. 601 at 25. Ordover testified that marginal cost pricing is not sustainable in industries like this, with high fixed costs and low marginal cost. Tr. 729-31. He also claimed

that a great portion of the costs of depth-of-book data were joint costs, like the costs of paying rebates for trade execution, that were currently not being allocated to depth-of-book data. Tr. 732-38. Ordovery also contested SIFMA's assertion that depth-of-book fees should be based off marginal cost, pointing out that numerous SIFMA members price the data on their own products above marginal cost. Nasdaq Ex. 601 at 27. According to Ordovery, the more appropriate methodology to measure competition and market power is an assessment of the market structure and competitive forces that constrain pricing. *Id.* at 26.

Bernard S. Donefer for SIFMA

Bernard S. Donefer was retained by SIFMA as an expert rebuttal witness.³⁵ He testified that depth-of-book data is essential to market participants. SIFMA Ex. 376 at 13561. Donefer argued that ArcaBook and Nasdaq's TotalView provide a complete picture of each exchange's depth-of-book that cannot be obtained elsewhere. *Id.* at 13562. Using the example of WD-40 Co., Donefer explained that depth-of-book data allow a trader "to see *all* of the visible orders available for a security on a particular exchange at *all* price levels." *Id.* at 13573. Donefer testified that without depth-of-book data from all the exchanges, a trader seeking to execute a particularly large order would not know how to make his routing and trading decisions. *Id.*³⁶ Donefer also stated that depth-of-book data has become more valuable with the introduction of decimalized trading, which allows shares to be traded on a spread of just one cent and which considerably reduced the amount of shares available at the best bid and offer prices. *Id.* at 13576.

According to Donefer, each exchange's order book is entirely unique, and a trader at any given time cannot expect the order book on one exchange to be representative of the order book on another exchange. SIFMA Ex. 376 at 13587; Tr. 815. Donefer was emphatic that depth-of-book data is essential for market participants, like high-frequency traders, who need core and non-core data at the fastest speeds. SIFMA Ex. 376 at 13578. Exchanges are required to provide core data, which includes the NBBO on each stock, but that data are given to a central processor that aggregates the data before distribution, and this creates a delay. *Id.* at 13578-79. In contrast, subscribers to a direct depth-of-book feed get core data directly at the fastest speed possible between the exchanges and the subscriber. *Id.* at 13579. According to Donefer, active traders without depth-of-book data are at a substantial disadvantage, citing a report by Hendershott that receipt of core data from the central processor lagged behind receipt of core data on a depth-of-book direct feed tens of thousands of times over a single day. *Id.* In addition, Donefer testified

³⁵ Donefer is a distinguished lecturer at the Zicklin School of Business at Baruch College of the City University of New York, associate director of the Zicklin School's Subotnick Financial Services Center, and an adjunct associate professor at the Stern School of Business at New York University. SIFMA Ex. 376 at 13561. Before entering academia in 2003, Donefer's career in the securities industry included serving as a senior vice president and head of capital markets systems at Fidelity Investments in Boston, where he was responsible for Fidelity's trading systems. *Id.*

³⁶ Donefer discussed and provided examples of how depth-of-book data is used for large orders. SIFMA Ex. 376 at 13573-76.

that depth-of-book data are vital for traders who wish to place “imbalance only” orders in the exchanges’ open and close auctions. *Id.* at 13580; Tr. 833-35.

Donefer argued that several categories of investors require access to all depth-of-book products from every exchange, including pension funds, mutual funds, insurance companies, large endowments, and broker-dealers working for those entities, all of which often trade in quantities so large that they require depth-of-book data to formulate strategies for executing trades. SIFMA Ex. 376 at 13581-82. Market participants for whom depth-of-book data are essential also include short-term traders that trade on mathematical arbitrage models, market makers, and some retail investors. *Id.* at 13582-83. Donefer testified that a broker-dealer that does not purchase all available depth-of-book products will see its order execution decline, because it will not be able to optimize the quantity of shares traded at the best price. *Id.* at 13585. Donefer testified that, because brokers have to meet their duty of best execution, they cannot move order flow easily, and that a broker’s ability to meet best execution is measured by regulators and clients. Tr. 931-32. A broker’s execution quality is evaluated within the industry, and a broker with declining execution quality will lose customers. *Id.* at 13585-86. In Donefer’s opinion, brokers are therefore heavily reliant on ArcaBook and TotalView, at any price. *Id.* at 13586.

Donefer testified that all broker-dealers need depth-of-book data from all the major exchanges, or otherwise they run the risk of not meeting their duty of best execution. Tr. 919-20. It is Donefer’s opinion that institutional investors will always choose a broker with full depth-of-book data access over one without it because of the advantages offered in terms of trade execution, speed, and better queue placement. Tr. 996. Donefer acknowledged that to obtain a direct depth-of-book feed would require a significant investment in infrastructure. Tr. 965-66.

Donefer agreed that about one hundred firms absolutely require all depth-of-book data from every major exchange, and that these firms account for a large percentage of the transactions on exchanges. Tr. 1013-14. Donefer testified that these one hundred firms have no choice but to buy depth-of-book data from every major exchange. Tr. 1016. However, these firms’ opportunities to shift order flow are limited by economic realities; even ██████ stated it would shift order flow subject to best execution. Tr. 1039. Donefer concluded that it was not sustainable for ██████ to permanently route order flow away from Nasdaq due to Regulation NMS, which states that if you have a client order, you must route it to the source of the best price in the market at that time.³⁷ Tr. 1039, 1047.

Donefer criticized Hendershott and Nevo’s conclusions that trading is not concentrated on an individual exchange, noting that their study conceded that trading for 10% of all securities *was* concentrated. SIFMA Ex. 376 at 13577. Donefer argued that the study, based off trading patterns over an entire month, ignored the possibility that at any given time, trading may be highly concentrated within a certain exchange. *Id.* at 13577-78.

³⁷ SIFMA presented no evidence, aside from Donefer’s testimony, to support the idea that traders were limited in shifting order flow.

Donefer did not consider the Hendershott and Nevo analyses persuasive. Donefer found, for instance, that some of their studies are skewed because they did not include market participants who receive depth-of-book data from a third party like Bloomberg. SIFMA Ex. 376 at 13589. He also argues that some attrition in ArcaBook's subscribers after the introduction of fees could be explained by the Great Recession occurring at the same time. *Id.*

David S. Evans for SIFMA

David S. Evans offered expert testimony on whether the Exchanges are subject to significant competitive forces in setting their depth-of-book fees and rebutted the economic analyses and opinions of Hendershott, Nevo, and Ordovery.³⁸ Tr. 1064; SIFMA Ex. 377.

Evans concluded that competitive forces did not constrain the pricing of depth-of-book data because customers lacked good substitutes. Tr. 1066. In determining whether depth-of-book products were substitutes for each other, Evans considered if customers actually switched when prices went up, and testified that the evidence shows they do not. Tr. 1134-35. Evans noted, for instance, that when ArcaBook dramatically increased its prices, it lost few subscribers. Tr. 1066-67. Evans testified that it is likely that for many customers, ArcaBook and Nasdaq's depth-of-book products are complements, not substitutes, and that those customers need both. Tr. 1139.

Evans admitted that order flow competition was very intense; however, he saw no evidence suggesting raising depth-of-book prices caused the Exchanges to lose order flow. Tr. 1170, 1317. Even if it did, Evans believed that, because profits are higher on depth-of-book data sales, an exchange might still earn enough additional revenue from higher depth-of-book prices to offset any loss in order flow revenue. Tr. 1318-19.

Evans testified that he had learned from a [REDACTED] representative that [REDACTED] had been able to pull order flow from Nasdaq only for a short time because the costs were too great. Tr. 1192-93. Evans was surprised when shown an exhibit demonstrating that [REDACTED] had in fact kept order flow with Nasdaq low for several years. Tr. 1200; Nasdaq Ex. 619. However, Evans pointed out that even if [REDACTED] diverted its order flow for a longer period than he realized, it was still not successful in convincing Nasdaq to lower its data fee prices. Tr. 1200-01.

Evans considers the Exchanges "multi-product" firms because they offer multiple related products such as trading services, listing services, and depth-of-book data. SIFMA Ex. 377 at 13683. Evans claims such firms will charge higher prices for products with more inelastic demand and fewer substitutes, such as depth-of-book data. *Id.* at 13683-85. On the other hand, such firms will charge lower prices for products facing stiff competition, such as trading services to attract order flow. *Id.* at 13685. As a result, Evans argued that heavy competition for trading

³⁸ Evans, chairman of Global Economics Group, has a Ph.D. in economics from the University of Chicago, has taught antitrust economics for more than twenty-five years, and has authored five major books and more than one hundred professional articles. SIFMA Ex. 377 at 13676, 13717.

services and order flow could encourage the Exchanges to increase depth-of-book data prices and use those profits to subsidize lower prices for trading services. *Id.*

Evans argued that the availability of depth-of-book data from other exchanges does not constrain the Exchanges' depth-of-book pricing. SIFMA Ex. 377 at 13686-95. Hendershott and Nevo's analysis showed that NYSE Arca lost only 5% of its accounts and 2% of its subscribers in 2009 after it began charging certain subscribers up to \$750 a month for depth-of-book data. *Id.* at 13689-90. To Evans, this demonstrated that ArcaBook customers "could not find substitutes" and "decided to continue purchasing ArcaBook." *Id.* at 13689-90. Evans also contended that the regression analysis, purporting to show a fall in NYSE Arca's market share due to charging fees for ArcaBook, is fatally flawed because it failed to account for the transition of BATS from an alternative trading venue to an exchange, which alone would have significantly reduced NYSE Arca's share of trading volume amongst exchanges. *Id.* at 13697-98.

Likewise, Evans considered Ordover's "churn" analysis fatally flawed because it failed to account for customers who may have stopped purchasing Nasdaq depth-of-book data directly but instead opted to buy it through a redistributor like Bloomberg. SIFMA Ex. 377 at 13690. In addition, Evans faulted the analysis for failing to account for the effects of the Great Recession, when many firms that dropped Nasdaq depth-of-book data may have simply gone out of business. *Id.* at 13690-91. Evans claimed that, aside from a flawed churn analysis, Ordover's only evidence of competition in depth-of-book data is a list of seven customers who switched between Nasdaq and NYSE Arca from 2006-2014. *Id.* at 13692. Evans concluded from Ordover's churn analysis that there was very little switching done by Nasdaq's depth-of-book customers. Tr. 1067. Moreover, Evans argued that the fact NYSE Arca only lost 2% of its subscribers when it instituted fees for ArcaBook is the evidentiary "gold standard" in determining that NYSE Arca had significant market power. Tr. 1095, 1109-10.

Evans recognized an interdependent relationship between order flow and market data sales, but maintained there is no basis for concluding that competition for order flow restrained the price of market data. SIFMA Ex. 377 at 13696. Evans opined that Exchanges lowered prices for order flow and subsidized that reduction by raising the prices of depth-of-book data, and to support this, he cited to evidence showing that, even while the Exchanges' market share for order flow declined, they continued to raise prices for their depth-of-book data. *Id.* at 13696-97. Evans also claimed that analytical mistakes invalidated Hendershott and Nevo's conclusion that NYSE Arca priced depth-of-book data on the inelastic demand curve. *Id.* at 13699. Finally, Evans criticized Ordover's testimony about firms threatening to divert order flow as unpersuasive, irrelevant, and inconsistent with scientific methods for making inferences. *Id.* at 13700-02.

ARGUMENTS OF THE PARTIES

Nasdaq

Nasdaq insisted that its depth-of-book fees are consistent with the Exchange Act because the market for depth-of-book data is subject to significant competitive forces. Nasdaq Br. at 12. Nasdaq argued that the Commission and the D.C. Circuit have recognized two types of

competitive forces that can put pressure on pricing depth-of-book data: 1) the availability of alternative products; and 2) competition for order flow. *Id.* at 10. Nasdaq argued that the Exchanges established the existence of these competitive forces with evidence sufficient to overcome the evidentiary deficiencies the court found when it invalidated the Commission's 2008 ArcaBook Order. *See id.* at 11-26.

According to Nasdaq, its customers fall into two groups: 1) the vast majority of traders, who either require no depth-of-book data or do not require depth-of-book data from all exchanges; and 2) one hundred or so firms, comprising of banks and electronic trading firms, which require depth-of-book data from every major exchange. *See* Nasdaq Br. at 1-5. For the first group, Nasdaq argued that the Exchanges' depth-of-book prices are constrained by the threat that these customers will either reduce their usage or substitute depth-of-book products from other exchanges when the prices get too high. *Id.* at 1-3, 12-19. For the second group, the Exchanges' depth-of-book prices are constrained because the one hundred firms exert massive negotiating leverage over the Exchanges because they account for up to 90% of the order flow on Nasdaq. *Id.* at 3-5, 19-26.

For the first group, Nasdaq claimed that the vast majority of consumers do not buy depth-of-book data, do not need depth-of-book data from all exchanges, or trade in dark pools where there is no depth-of book data. Nasdaq Br. at 12. Furthermore, Nasdaq pointed out that out of all professional traders who purchase some type of market data from Nasdaq, only about 24.3% buy some type of depth-of-book product and only 8.57% subscribe to TotalView, Nasdaq's full depth-of-book product for Nasdaq-listed stocks. *Id.* at 13-14. As a result, Nasdaq maintained that it is restrained from setting too high a price on its depth-of-book data because the majority of customers can either switch to another depth-of-book product or reduce or eliminate their use of depth-of-book data. *Id.* at 14-15. Nasdaq cited to evidence from its witnesses, Albers and Ordovery, showing that approximately thirty firms have switched from Nasdaq depth-of-book products. *Id.* at 15-16; Nasdaq Reply Br. at 9-10. Nasdaq also claimed the evidence shows that the mere threat of switching has caused Nasdaq to reduce its prices to keep customers. Nasdaq Br. at 17-19.

For the second group, Nasdaq argued that the one hundred firms requiring all depth-of-book data have "the upper hand" in negotiations, because "[w]ithout the order flow, Nasdaq really doesn't exist," and the threat of switching by these powerful one hundred firms provides a significant constraint on depth-of-book-pricing. Nasdaq Br. at 3-5, 19-26; Nasdaq Reply Br. at 11-17. Nasdaq claimed that if it raises prices too high for depth-of-book data, the one hundred firms would punish it by routing order flow elsewhere. Nasdaq Br. at 19-26. Because order flow is the "life blood" of Nasdaq, it argued that this threat constrains its pricing of depth-of-book data. *Id.* at 4, 20-21. As an example, Nasdaq cited ██████████ withdrawal of half of its order flow from Nasdaq from 2012 to today, and threats of similar action by other customers. Nasdaq Br. at 22-23. It also cited other examples of powerful entities threatening to shift order flow away from Nasdaq. *Id.* at 23-24.

Nasdaq also argued that the evidence of its competitive constraints can be seen in the consistently low prices assessed for its depth-of-book products. Nasdaq Br. at 26-30. It claimed that, contrary to SIFMA's claims, its depth-of-book prices have either remained constant or

actually declined over the years. *Id.* at 27-29. Nasdaq conceded that its April 2012 filing was a “meaningful price increase,” but stated that it was the “only instance” of a meaningful price increase from 2006 until now. Nasdaq Reply Br. at 5. Nasdaq also defended the rationale behind the price increase, arguing that it was “fully consistent with higher demand by high-intensity computer data users who were consuming the data at a far greater rate and were deriving far greater value.” *Id.* Nasdaq claimed that this price increase was carefully implemented, and essentially applied only to the one hundred firms. Nasdaq Br. at 30. Nasdaq also argued that, in 2003, it implemented significant permanent reductions in subscription fees for TotalView and OpenView. *Id.* at 27. In subsequent years, Nasdaq also significantly decreased distribution and direct access fees for TotalView and OpenView. *Id.* at 28 nn.7-9. Nasdaq contended that its pricing decisions always take into account potential client impacts and that the considerable sums it spends on marketing and promoting depth-of-book products demonstrate that it faces serious competition. *Id.* at 31-34. Nasdaq criticized SIFMA for failing to produce any supporting witnesses, documents, or data from any of its members. Nasdaq Reply Br. at 2.

Nasdaq stated that the marginal cost of producing depth-of-book data is largely irrelevant because the costs of producing market data are not properly reflected in its accounting. Nasdaq Br. at 37-42. This is because Nasdaq incurs significant joint costs in creating a trading platform and attracting order flow, and without either, its depth-of-book data would be valueless. *Id.* at 39, 41-42. However, when Nasdaq does its accounting, none of these joint costs are allocated to the depth-of-book data, and the result is that profit margins for depth-of-book data appear far greater than they are in reality. *Id.* at 41-42. Nasdaq also claimed that profit margins are largely irrelevant for determining whether an entity is constrained by competition. *Id.* at 42.

Lastly, Nasdaq argued that SIFMA represents Nasdaq’s competitors, not the investing public, and that even if I found that Nasdaq’s products were not subject to significant competitive forces, the fees for depth-of-book data would still be in the public interest. Nasdaq Br. at 44-45.

NYSE Arca

NYSE Arca insisted that the sole issue, based on *NetCoalition I*, is whether the evidence in this record satisfies the market-based approach espoused by the Commission. NYSE Arca Br. at 1. NYSE Arca argued that the issue of sufficient competition is determined by the following criteria: are sellers of depth-of-book data subject to competitive constraints; does the risk of a reduced order flow constrain depth-of-book data prices; and does “trader behavior” indicate there are alternatives to purchasing an exchange’s depth-of-book data? *Id.* NYSE Arca believes the record provides an affirmative answer to each of these questions. *Id.* at 2-3.

NYSE Arca argued that its prices are constrained by the threat of large firms shifting order flow elsewhere. NYSE Arca Br. at 20-22. In support, NYSE Arca cited the [REDACTED] example, which it claimed clearly established the linkage between order flow and pricing of depth-of-book data, as well as examples of several of its own customers threatening it with shifting order flow. NYSE Arca Br. at 20-23; NYSE Arca Reply Br. at 9-10. NYSE Arca also cited a regression analysis conducted by its expert witnesses, purporting to show that NYSE

Arca's share of order flow declined by 9.8% relative to the rest of the trading market after it introduced fees for ArcaBook. NYSE Arca Br. at 24. NYSE Arca reiterated that ArcaBook is priced in the inelastic region of the demand curve in order to increase trading volume. *Id.* at 26-27. According to NYSE Arca, a profit-maximizing firm with market power would never price its product on the inelastic part of the demand curve because raising prices into the elastic portion of the demand curve would increase profits. *Id.* at 26. However, NYSE Arca prices its product on the inelastic demand curve because by raising prices, it would risk lowering demand for the complementary product, trade executions. *Id.* at 26-27; NYSE Arca Reply Br. at 14-15.³⁹ NYSE Arca also argued that when it increases prices, those increases often reflect the increased value of the depth-of-book product. NYSE Arca Br. at 8.

NYSE Arca also argued trader behavior and the availability of substitutes show that ArcaBook pricing is constrained. NYSE Arca Br. at 27-35. NYSE Arca cited evidence which it contends shows that most traders do not need depth-of-book data from all the major exchanges. *Id.* at 28-29. For instance, NYSE Arca cited evidence showing that among a selection of Nasdaq's depth-of-book customers, only 54% also purchased the depth-of-book data from NYSE Arca and the New York Stock Exchange. *Id.* at 28. Moreover, NYSE Arca argued that several prominent broker-dealers only buy depth-of-book products from Nasdaq, NYSE Arca, or the New York Stock Exchange, but not from all three because depth-of-book data from the exchanges are substitutes because of the large overlap in the stocks they trade. *Id.* at 29-30. NYSE Arca took issue with SIFMA's insistence that the Exchanges provide evidence of traders switching from one depth-of-book product to another, arguing that *NetCoalition I* only required evidence of the availability of alternatives. NYSE Arca Reply Br. at 15-16.

NYSE Arca also contended that ArcaBook is sold in a competitive market, citing to conclusions by the Department of Justice's Antitrust Division that the securities exchange data product market faced significant competition. NYSE Arca Br. at 13-14. NYSE Arca further maintained that new, vigorous competition among trading platforms disciplined depth-of-book data pricing by forcing exchanges to keep overall costs of trading low to avoid losing business to new competitors. *Id.* at 14.

NYSE Arca was highly critical of the positions taken by SIFMA's expert witnesses. NYSE Arca Br. at 15-19, 25-26, 33-35, 41-43. It rejected Evans's position that the Exchanges have significant market power over their depth-of-book products because each controls the source of information on liquidity on its exchange below top of book, noting, among other things, that the Ford Motor Company is the only source of Ford automobiles yet faces competition in the auto industry. *Id.* at 17-18. NYSE Arca also argued that SIFMA did not provide any evidence of trader behavior related to substitution, and that many SIFMA members re-sell depth-of-book data for profit and operate alternate trading venues that compete with the Exchanges for order flow. *Id.* at 32, 35-36. NYSE Arca contended that SIFMA filed its petition

³⁹ Hendershott and Nevo concluded that NYSE Arca was pricing on the inelastic portion of the demand curve by comparing the increase in revenue when it started charging for ArcaBook with the loss of ArcaBook subscribers. NYSE Arca Ex. 65 at 1569. The percentage change in the loss of subscribers was "substantially smaller in magnitude than the percentage change in price," leading them to conclude that demand was inelastic. *Id.*

to force exchanges to lower the price of market data products for the benefit of certain SIFMA members. NYSE Arca Reply Br. at 4-5. NYSE Arca also argued that profit margins and costs are meaningless in assessing depth-of-book data fees because accounting measures do not reflect market power. NYSE Arca Br. at 37-38; NYSE Arca Reply Br. 20-21.

In response to SIFMA, NYSE Arca contended that any price increases were reasonable and reflect “the value received by customers for their use of ArcaBook.” NYSE Arca Reply at 17. NYSE Arca also pointed out that many key prices remain constant, for example, the non-professional ArcaBook user fee has not changed since it was implemented. *Id.* at 18. NYSE Arca concluded that SIFMA has not met its burden of establishing a “substantial countervailing basis” to find that its filing as to ArcaBook violates the Exchange Act or Commission rules, and that SIFMA’s arguments are contrary to the public interest. NYSE Arca Br. at 38, 44-45.

SIFMA

SIFMA contended that the evidence overwhelmingly shows that the Exchanges’ depth-of-book pricing is not significantly constrained by alternative data sources or the possibility of order flow being routed elsewhere. Instead, SIFMA argued that an Exchange’s depth-of-book data are an exclusive product, containing data unique to each exchange that is essential to many traders. SIFMA Br. at 9-10, 17-32. SIFMA contended that depth-of-book data are essential for several reasons. One, they provide far more information about the liquidity of any particular stock than one would obtain from core data alone. *Id.* at 9-10. Two, the only way to obtain a full picture of the available liquidity in the market is to subscribe to all the depth-of-book data from the major exchanges. *Id.* at 10. Three, shares now trade in decimalized form, which has “substantially decreased the depth at the best prices and substantially increased the depth at the various one cent price points inferior to the best prices.” *Id.* at 10-11 (quoting *NetCoalition I*, 615 F.3d at 530 n.7). Four, the low-latency provided by depth-of-book data are essential to participate in the Exchanges’ order imbalance auctions at the beginning and close of each trading day. *Id.* at 11. Finally, depth-of-book data proprietary feeds are much faster than the feeds for core data and other market data. *Id.* at 11-12. SIFMA alleged that the Exchanges take advantage of the necessity of depth-of-book data by repeatedly raising existing fees and creating new fees. *Id.* at 12-14. SIFMA asserted that depth-of-book fees have been extremely lucrative for the Exchanges, with profit margins for some products of 85%. *Id.* at 14-15.

SIFMA disputed the argument that alternatives constrain the Exchanges’ depth-of-book pricing. It argued that the best way to determine whether substitution constrains prices is by looking at customer behavior when prices increase. SIFMA Br. at 17-19. The evidence, SIFMA asserted, showed almost zero substitution when prices increased. *Id.* at 18-19. SIFMA argued that NYSE Arca imposed a “massive fee increase,” up to 74,900%, when it began charging for ArcaBook in 2009. *Id.* at 13, 19. Prices went from zero for all subscriptions to \$10 a month for nonprofessional subscribers, \$30 a month for professional subscribers, and \$750 a month for direct feed subscriptions. *Id.* at 19. Despite this increase, ArcaBook’s professional subscribers only dropped 2%, and the number of accounts dropped 5%. *Id.* at 20. SIFMA asserted that such a small drop “indicates that most of the subscribers who obtained ArcaBook could not find substitutes in the face of this massive price increase.” *Id.*

SIFMA also argued that Nasdaq lost only 17.7% of its customers and only 3.1% of Nasdaq's depth-of-book revenue, or "virtually no substitution whatsoever," after imposing a fee increase in 2012. SIFMA Br. at 22-23. Furthermore, SIFMA stated that the Exchanges have only identified a few anecdotal examples of customers switching between depth-of-book products, and that none of the evidence demonstrates that any of the switching was in response to price changes. *Id.* at 21-25, 29-30.

SIFMA also argued that NYSE Arca was able to identify only one customer who had dropped a depth-of-book product because of price, and it disputed that there was even one because the customer dropped the Arca integrated feed and not ArcaBook. SIFMA Br. at 22 & n.15. SIFMA accused NYSE Arca of failing to present any evidence showing that it ever suffered significant subscriber losses in response to "any of the numerous other price increases" over the past seven years, including two price increases over the past two years. *Id.* at 14, 19, 21. As for Nasdaq, SIFMA argued that the evidence shows a number of price increases with little to no loss of subscribers. *Id.* at 22-23. SIFMA also dismissed Nasdaq's expert's churn analysis as flawed and unreliable. *Id.* at 23 n.16.

SIFMA took issue with evidence from the Exchanges showing that some customers buy depth-of-book data from some but not all exchanges; to SIFMA, this evidence has no relevance as to whether customers actually switch between the products in response to price changes. SIFMA Br. at 29. SIFMA also considered irrelevant the evidence that trading in securities is dispersed across many exchanges. *Id.* at 30-31. And SIFMA dismissed the findings of the Department of Justice's Antitrust Division, which it contended focused on a different issue and examined different evidence. *Id.* at 31-32.

SIFMA also claimed that the Exchanges have failed to show that competition for order flow constrained their depth-of-book prices. SIFMA Br. at 32. SIFMA conceded that competition for order flow is intense, but argued that the Exchanges presented no evidence showing that competition for order flow actually constrains depth-of-book fees. *Id.* at 33. SIFMA argued that traders, because of order execution obligations, including best execution, have limited ability to "penalize" the Exchanges for raising depth-of-book prices by shifting their order flow elsewhere. *Id.* at 33-34. SIFMA claimed that the Exchanges have produced evidence of only one customer who shifted order flow in response to a depth-of-book fee increase, and that this falls far short of carrying the Exchanges' burden. *Id.* at 35. SIFMA argued that this confirmed that traders have limited ability to shift order flow, because Nasdaq personnel recognized that [REDACTED] was "shooting themselves in the foot." *Id.*

SIFMA claimed that NYSE Arca's regression analysis, the "only effort either Exchange made to present systematic evidence of a relationship between depth-of-book data fees and order flow," contained several fatal flaws. *Id.* at 38-40. SIFMA believes the regression analysis demonstrates that NYSE Arca was losing order flow even before the depth-of-book fees were introduced, such as when other exchanges entered the market and decreased NYSE's share of exchange trading volume, and therefore is of little value. *Id.* at 39. SIFMA claimed that the experts failed to study the impact on order flow of price increases for high-frequency and algorithmic traders in 2013 and 2014. *Id.* at 39-40. And SIFMA argues that competition for order flow has actually *increased*, not decreased, depth-of-book prices. *Id.* at 40-47. Finally,

SIFMA argued that the Exchanges' cost and profit margins are relevant under *NetCoalition I*, and that Nasdaq's high profit margins and NYSE Arca's refusal to disclose profit margins indicate significant market power. *Id.* at 48-54.

LEGAL CONCLUSIONS

Under the standards articulated by the Commission and D.C. Circuit, the Exchanges have shown that they are subject to significant competitive forces in setting fees for depth-of-book data: the availability of alternatives to the Exchanges' depth-of-book products, and the Exchanges' need to attract order flow from market participants constrains prices. There is no substantial countervailing basis to find against the Exchanges. The SRO rules at issue make available valuable proprietary information to anyone on a basis that is not unreasonably discriminatory from sources that are under no obligation to provide it. The Exchanges' pricing for depth-of-book data is uniformly applied to similar-situated subscribers. Tr. 384, 617-18. Accordingly, the SRO rules at issue implementing fees for depth-of-book data are consistent with and in furtherance of the purposes of the Exchange Act.

Depth-of-book products covered

I conclude that ArcaBook, and Nasdaq's Level 2, OpenView, and TotalView are all subject to this proceeding. The parties agree that ArcaBook and Level 2 are at issue. But SIFMA and Nasdaq disagree as to whether the challenged 2010 Nasdaq Rule also relates to OpenView and TotalView. Nasdaq Br. at 1 n.1, 36; SIFMA Br. at 4 n.1. Nasdaq argued those products are not at issue because the 2010 Nasdaq Rule sought to harmonize only certain Level 2 fees with those of OpenView and TotalView, and that fees for those latter two products were not increased. Nasdaq Br. at 36; *see* Nasdaq Ex. 548 at 392-93. But SIFMA countered that in harmonizing Level 2's fees with those of OpenView and TotalView, the 2010 Nasdaq Rule re-imposed the fees for all three products. SIFMA Br. at 4 n.1.

SIFMA's argument is correct. The 2010 Nasdaq Rule did not impose a new fee applying only to Level 2. Nasdaq Ex. 548 at 392. Instead, it removed language that limited certain existing fees only to TotalView and OpenView. *Id.* (noting that language within the brackets was to be removed). Without that limiting language, those fees applied to TotalView, OpenView, and Level 2 as well. *Id.* In effect, Nasdaq withdrew two fees that applied only to TotalView and OpenView, respectively, and then imposed new, broader fees, that applied to those products and Level 2. Accordingly, the 2010 Nasdaq Rule imposed new fees on TotalView, OpenView, and Level 2, and all three data products are subject to this proceeding. The Commission indicated as much. *SIFMA*, 2014 SEC LEXIS 1686, at *55 (consolidating the ArcaBook challenge with "the challenge to the fees for NASDAQ's depth-of-book *products*" (emphasis added)).

Cost and profit margin data are not required

The parties extensively dispute the relevance of the Exchanges' cost and profit margins in producing depth-of-book data. In *NetCoalition I*, the court stated:

[I]n a competitive market, the price of a product is supposed to approach its marginal cost . . . [s]upracompetitive pricing may be evidence of “monopoly,” or “market,” power . . . [and] the costs of collecting and distributing market data can indicate whether an exchange is taking “excessive profits” . . . [e]ven NYSE Arca’s proposal acknowledges that costs are relevant in assessing the reasonableness of its fees.

615 F.3d at 537-38. As a result of the court’s language, this record contains a great deal of evidence on the Exchanges’ cost and profit margins in producing depth-of-book data.

It is essentially undisputed that the Exchanges enjoy strong profit margins from the sale of depth-of-book data. For example, Nasdaq’s profit margin for the sale of depth-of-book data is consistently over 80%. SIFMA Ex. 142 at 2; *see also* SIFMA Ex. 317 at 8848 (characterizing information services, which includes depth-of-book sales, as “high margin”); SIFMA Ex. 318 at 8876 (showing 70% operating margins for information services). Shavel characterized information services as “our largest operating profit contributor,” a product with “relatively strong pricing power,” and acknowledged that depth-of-book sales enjoyed a “relatively high margin.” Tr. 1337; SIFMA Ex. 319 at 8902. NYSE Arca submitted no evidence relating to its costs and profit margins, but based on the similarity of the Exchanges’ business models, it is reasonable to assume that NYSE Arca enjoys similar profit margins.

Depth-of-book costs and profit margins, however, have limited significance on these facts. First, *NetCoalition I* did not *require* cost or profit margin data, but simply stated that such data may be relevant in determining market power. *NetCoalition I*, 615 F.3d at 537 (rejecting petitioner’s cost-based challenges but explaining “we do not mean to say that a cost analysis is irrelevant”).

Second, the Exchanges demonstrated their depth-of-book costs and profit margins are misleading because they incur significant costs in creating a trading platform and attracting trading volume, but none of these joint costs are allocated to depth-of-book data. *See* Tr. 1337-38 (Shavel explaining that for accounting purposes, none of the costs of running a trading platform are allocated to Nasdaq’s data business); *see also* Tr. 1132 (Evans explaining that “there are empirical problems with determining profit margins”). Nasdaq pays 700 to 800 million dollars in rebates to attract order flow. Tr. 734-36, 1029-1031. Without that order flow, Nasdaq would have no depth-of-book data to sell. Tr. 432, 735. If even a small portion of those rebate costs were allocated to depth-of-book data, the high profit margins of Nasdaq’s depth-of-book data sales would be severely diminished. Tr. 389, 737-38, 1031-32. The low costs and high profit margins for Nasdaq’s depth-of-book data are largely due to Nasdaq’s own accounting practices and are misleading in terms of the true cost of producing the product.

Third, the evidence is persuasive that the Exchanges’ costs and profit margins are of limited value in determining whether the Exchanges are constrained by competition. Experts for both sides testified that *NetCoalition I*’s instruction that prices should approach marginal costs in a competitive market relied on a theoretical model of perfect competition rarely seen in practice. Tr. 301-02, 379-80, 1090-92, 1145-46. The experts also agreed that a scenario in which prices equaled marginal costs was particularly unrealistic in a market, like this, with high fixed costs

and low marginal costs. Tr. 380, 730-32, 1090, 1146. Moreover, even extremely profitable markets can still be competitive. For example, Nasdaq's profit margins in the trading business, an industry which is indisputably highly competitive, approach 40-50%. Tr. 1086-88, 1339-40; SIFMA Ex. 318 at 8878. SIFMA's own expert testified that "in this matter, I have not put much weight on the price cost margin," and warned that evidence of profit margins must be "treated carefully." Tr. 1132-34. For these reasons, the Exchanges' costs and profit margins are given little weight in this decision.

Determinative Findings

The record evidence shows that competition plays a significant role in restraining exchange pricing of depth-of-book products.

Alternative depth-of-book products from other exchanges are a significant competitive force

This record showed that depth-of-book products from different exchanges function as substitutes for each other. The Exchanges' unchallenged evidence is that no single exchange dominated trading; of nearly 8,200 stocks, only 10% of the stocks examined were likely to be concentrated in any particular exchange, and those 10% of stocks accounted for just 3% of trading volume and market capitalization across all stocks. NYSE Arca Ex. 65 at 1563, 1577. In fact, when weighted by trading volume, the likelihood that a security trading on one major exchange trades on another major exchange is over 99%. *Id.* at 1576, 1588. Accordingly, because of the overlap in traded stocks, depth-of-book data related to prices and quantities can be heavily correlated across exchanges, and depth-of-book products from different exchanges can be used as substitutes for each other. *Id.* at 1577-78; Tr. 174-80. In *NetCoalition I*, the court stated "[d]epth-of-book data from other exchanges could be an alternative . . . but that determination cannot be made without knowing how actively the security is trade[d] on those exchanges." 615 F.3d at 543. Contrary to SIFMA's objections, the evidence here demonstrates that trading in securities is widely dispersed across exchanges and that price and quantity information can be correlated between the exchanges.

The Exchanges have provided persuasive evidence that the threat of substitution from depth-of-book customers constrains their depth-of-book prices. The evidence shows that switching between depth-of-book products is commonplace. Albers identified three customers who dropped TotalView to switch to ArcaBook. Tr. 565. Ordover identified numerous firms that had switched between ArcaBook and Nasdaq's depth-of-book products, including Lynx Capital Partners, Soros Fund Management, PHD Capital, MWD Energy, Standard Pacific Capital, Tradeking Group, and Berner Kantolnal Bank. Nasdaq Ex. 601 at 16. At the hearing, Ordover claimed to have identified 31 to 35 examples of customers switching between ArcaBook and Nasdaq's products. Tr. 702. Brooks also provided an example of a company, BlueFin, which dropped ArcaBook in direct response to a price increase, and examples of two companies, Lime Brokerage and Pico Trading, which threatened to drop ArcaBook if prices kept increasing. Tr. 71-75. The Exchanges also relied on a "churn analysis" conducted by Ordover, which measured the number of depth-of-book customers Nasdaq lost and added each year from 2008 to 2014, showing that anywhere from 23% to 41% of its total customer base was lost or

added each year. Nasdaq Ex. 601 at 14-15. The churn analysis also showed that during that period, large customers, particularly brokers, substantially reduced or increased (or both) the number of subscribers for Nasdaq depth-of-book data. *Id.* at 14-15. The churn analysis does not conclusively establish that customers dropped or added Nasdaq depth-of-book data due to pricing, but it does demonstrate the large percentage of customers that shift in and out of Nasdaq's depth-of-book customer base each year.

The record shows that the Exchanges implement their depth-of-book prices out of concern for losing subscribers to substitutes. For instance, before setting a new depth-of-book price, Nasdaq performs "a lot of internal analysis, modeling out what the different pricing changes would look like, what we think the potential individual client impacts are," and determining whether "the price [is] commensurate with the value of the deal." Tr. 496. Nasdaq reaches out to subscribers, "walk[s] them through what [it is] looking to do," obtains their feedback, and even goes in front of SIFMA's market data committee every six months to solicit comments. Tr. 497. NYSE Arca also sets prices to deliberately prevent customer substitution or attrition. Tr. 143. The concern with customer substitution or attrition is reflected in numerous internal documents. For example, Nasdaq uses detailed models to predict depth-of-book customer attrition and the overall impact on revenues at "various scenarios of different [depth-of-book] price levels." Tr. 415; *see* SIFMA Ex. 133 at 612. And a report prepared for Nasdaq executive management warned that "history has shown that data products that are not priced proportionately to the value they deliver, do not sell," and that "countless . . . competitors stand at the ready . . . if NASDAQ makes any missteps with respect to pricing strategy." Nasdaq Ex. 524 at 193.

Over time, the Exchanges have implemented a limited number of fee increases after initially imposing fees for their depth-of-book data products, further supporting the proposition that there is competitive market for such products that is constraining prices. For example, in 2003, Nasdaq lowered its prices for TotalView professional subscriptions from \$150 per month to \$70 per month, where it has remained unchanged. Tr. 452-53; Nasdaq Ex. 511 at 4. Its prices for TotalView non-professional subscriptions have also not changed since 2003. Tr. 453. In addition, Nasdaq capped or reduced numerous depth-of-book fees, and a few of the "fee increases" cited by SIFMA often had the effect of increasing costs for a small minority of customers while decreasing them for most. Tr. 455-62; SIFMA Ex. 379 at 13821; *see also* Nasdaq Ex. 542. When Nasdaq did increase a depth-of-book fee, the increase often applied only to its biggest customers or a small subset of that group, and in one case was motivated by a customer who admitted that his company was not getting charged commensurate to the value of the product. Tr. 462-72; SIFMA Ex. 379. Similarly, NYSE Arca began charging for depth-of-book data in 2009, and while it has instituted some new fees that primarily affect its largest customers, its original fees have remained mostly constant. Tr. 37-40 (describing the fees imposed in 2009); SIFMA Ex. 376 at 13593 (showing that fees for non-professional users have remained constant, and fees for professional users have gone up \$10 per month).

Discussion of opposing arguments

SIFMA contends that the evidence shows almost a complete lack of substitution in response to significant depth-of-book price increases. SIFMA Br. at 18-24. In particular, it

points to the “massive fee increase” when NYSE Arca began charging for ArcaBook in 2009, and prices went from zero to anywhere from \$10 to \$750 a month depending on the subscription type. *Id.* at 19; *see also* Tr. 87-88. Despite this, SIFMA contends that ArcaBook’s professional subscribers dropped only from 29,636 to 29,133, and the number of accounts fell only from 3,787 to 3,594, drops of approximately 2% and 5% respectively. SIFMA Br. at 20. SIFMA also argues that Nasdaq lost only 17.7% of its customers and only 3.1% of Nasdaq’s depth-of-book revenue, or “virtually no substitution whatsoever,” after imposing a fee increase in 2012. *Id.* at 23. Furthermore, SIFMA argues that the Exchanges have identified only a few anecdotal examples of customers switching between depth-of-book products, and that none of the evidence demonstrates that any of the switching was in response to price changes. *Id.* at 23-25, 29-30.

I reject, as unpersuasive, SIFMA’s argument regarding NYSE Arca’s low subscriber attrition. First, SIFMA grossly mischaracterized the extent of NYSE Arca’s price increase in 2009, by stating that prices increased anywhere from 900% to 74,900%. SIFMA Br. at 19. ArcaBook was priced at \$0 before 2009, so literally any price increase would appear massive when measured in this manner. Moreover, it is essentially undisputed that the price of \$0 for ArcaBook was not a competitive price, so it is inappropriate to use that as a baseline from which subscriber attrition is measured. Furthermore, even after NYSE Arca began charging for ArcaBook, it was still, in many respects, cheaper than competing products from Nasdaq and New York Stock Exchange. *See* SIFMA Ex. 376 at 13595. For these reasons, ArcaBook’s purportedly insufficient subscriber attrition numbers do not refute NYSE Arca’s position.

SIFMA’s arguments that Nasdaq’s subscriber attrition evidence is too anecdotal and fails to demonstrate causality are similarly unconvincing. For one, Albers thoroughly refuted SIFMA’s claims that Nasdaq repeatedly increased depth-of-book fees. Tr. 455-466; *see* SIFMA Ex. 379. But SIFMA’s argument fails even when applied to the one uncontested “significant price increase” of April 2012. SIFMA argued that because Nasdaq lost subscribers constituting only 3.1% of depth-of-book revenue in the year following the price increase, it demonstrates that Nasdaq’s prices are not constrained by substitution. But the April 2012 fee increase affected only a limited group of Nasdaq’s depth-of-book subscribers, the one hundred firms. Tr. 462-64; SIFMA Ex. 379. It is unreasonable to expect a sizable reduction of subscribers or subscriber revenue as a result of a fee imposed on a tiny group of subscribers.⁴⁰ Also, SIFMA’s entire argument relied on two events – that a fee was imposed in April 2012, and that Nasdaq lost 17.7% of customers and 3.1% of revenues in 2013 – but SIFMA has not shown any causative relationship between the two. Moreover, the fee increase in question was apparently instituted in response to a customer who had commented that the prices were low commensurate to the value of the data. Tr. 464; *see also* Tr. 471-72. A price increase to better reflect value may explain the loss of few subscribers.

The record established that the Exchanges have largely not raised their depth-of-book prices since each initially imposing fees; when they have, most of the price increases have

⁴⁰ This is particularly true because the fee increase here affected the one hundred firms, which Nasdaq claims constrain price through their control of order flow, not through substitution. *See generally* Nasdaq Br. at 19-26.

affected a handful of large customers, rather than large numbers of subscribers. The Exchanges have also demonstrated that they deliberately price their data at levels to avoid customer attrition.

Next, the evidence does not support SIFMA's contention that most traders cannot substitute one exchange's depth-of-book product for another's because they need depth-of-book data from *every* exchange. SIFMA Br. at 9-10. According to SIFMA, depth-of-book data from every exchange is essential because: (1) it provides the complete picture of liquidity for any security, made even more important after the "decimalization"⁴¹ of stocks; (2) direct feeds of depth-of-book data are faster than any alternative; and (3) for traders who engage in open and close auctions, it is the "exclusive low-latency" source of "order imbalance" information. SIFMA Br. at 9-12. As a result, SIFMA argues that the existence of multiple depth-of-book products does not serve to constrain prices because many of its largest customers cannot substitute alternative depth-of-book products even in the face of massive price increases. SIFMA Br. at 27-29.

For many market participants, having access to depth-of-book data from all exchanges would provide a clearer picture of liquidity that may be useful when engaging in large transactions, but useful information is not essential information. While depth-of-book data from all exchanges may be required for high-frequency traders who need the fastest feeds, or for traders participating in open and close auctions, both groups reflect only a small percentage of all market participants.

The evidence is that nearly 97% of all trades occur at or within the NBBO, thus most customers do not require any sort of depth-of-book data. NYSE Arca Ex. 65 at 1548; *see also* Tr. 24. Nasdaq has 350,000 professional data subscribers. Tr. 409. But only 85,000 of those 350,000 customers subscribe to any depth-of-book data, and among those 85,000, only 30,000 subscribe to Nasdaq's TotalView. *Id.* at 409-10. In other words, fewer than 10% of Nasdaq's market data customers subscribe to Nasdaq's comprehensive depth-of-book product. *Id.* at 409-10.

The evidence is that customers that need *some* depth-of-book data often do not need *all* depth-of-book data from every exchange. Hendershott and Nevo's unrefuted calculation is that over a 94-month period, Nasdaq depth-of-book subscribers also subscribed to ArcaBook and NYSE's OpenBook about half the time, subscribed to either ArcaBook or OpenBook about a fifth of the time, and did not subscribe to ArcaBook or OpenBook a quarter of the time. NYSE Arca Ex. 65 at 1572-73, 1587. Additionally, major broker-dealers like [REDACTED] do not directly purchase all depth-of-book data products from every major exchange. Tr. 49-52, 182-83; NYSE Arca Ex. 87. The Exchanges compete against each other to obtain depth-of-book customers and there would be little point in doing so if traders needed to purchase *all* depth-of-book products from every exchange. *See, e.g.,* SIFMA Ex. 121; Tr. 419-20, 429-30; *see also* Tr. 415 (Albers testifying that if customers were required to purchase depth-of-book data from every exchange, "I probably wouldn't be

⁴¹ Before decimalization, securities traded in increments of 12.5 cents, but now shares trade at a separate price point for every cent. SIFMA Br. at 10.

employed.”).⁴² It is clear that many customers find depth-of-book data from only some exchanges sufficient for their purposes.

Shifts in order flow and threats of shifting order flow provide a significant competitive force in the pricing of the Exchanges’ depth-of-book data

Order flow is the “life blood” of the Exchanges, and the one hundred firms that most consume and need depth-of-book data control an outsized portion of order flow. Nasdaq Br. at 4, 19-26; NYSE Arca Br. at 20; *see also* Tr. 450-51. There is fierce competition for order flow and “[a]n exchange’s ability to attract order flow determines whether it has market data to distribute.” *NetCoalition I*, 615 F.3d at 539 (alterations in original); *see also* Tr. 719, 1035, 1042, 1068; SIFMA Ex. 377 at 13695. A small group of traders account for a tremendous share of order flow, up to 90% of trades executed on Nasdaq’s platform, and these firms use their control of order flow to constrain depth-of-book prices. Tr. 1014, 1034; *see also* Tr. 450-51.

The sentiment that the customers who control order flow have strong leverage in negotiations is reflected in internal Nasdaq documents, such as a presentation for management, which warned that “[b]roker/[d]ealers hav[e] the upper hand in price negotiations as we are dependent on their flow.” Nasdaq Ex. 526 at 231; Tr. 451, 541-43. Albers also testified that many traders have even stronger leverage in negotiations, because the individual negotiating often has decision-making authority over both routing order flow and purchasing depth-of-book data, an assertion reflected in internal Nasdaq documents. Tr. 542-543; *see also* Nasdaq Ex. 527 at 268. According to Albers, moving order flow is common because “it’s very portable, and we’ve had clients move order flow because our CEO didn’t say the right thing in the press.” Tr. 514.

In 2012, Nasdaq raised fees for non-display uses of its depth-of-book data, which greatly angered ██████████, an executive at ██████████ in charge of order routing strategies. Tr. 503-05; Nasdaq Ex. 505 at 15. After Nasdaq employees attempted to justify the increased fees, ██████████ replied in an email, accusing Nasdaq of “placing false valuation to [its] depth of book.” Nasdaq Ex. 505 at 13. He then threatened:

You have the valuation today only because your clients (brokers, market makers, etc.) are placing orders with NASDAQ. That valuation you speak of will dissipate quickly as we begin pulling orders away from NASDAQ to other exchanges that appreciate and work with their clients. This simple relationship between market data and order flow should resonate with all your clients. As stated to you, we will follow through and vote with our order flow without impacting our best execution obligations.

⁴² Hendershott and Nevo’s analysis did not account for subscribers who received Nasdaq’s depth-of-book data from a redistributor. Tr. 343-45. However, this was not a willful omission. NYSE Arca Ex. 65 at 1572-73 n.101. Even with this deficiency, the analysis refutes the premise that depth-of-book subscribers need *all* depth-of-book products from the major exchanges. Tr. 346-47.

Id. at 13-14. After Nasdaq declined to re-evaluate its fee increases, ██████ routed both equity and options order flow to other exchanges. Tr. 510. ██████ order routing caused significant concern among Nasdaq employees. Tr. 510-12; Nasdaq Ex. 506. According to a Nasdaq employee, ██████ threatened that, unless Nasdaq re-evaluated its fee increases, ██████ would “vote the only way they can- through their [order] flow.” Nasdaq Ex. 507 at 21. In particular, ██████ threatened to do the following:

1. all discretionary orders will be routed away from NASDAQ,
2. They will remove all depth of book fees from their routers wherever they can and
3. They will move all off-exchange quotes to NYSE. They are willing to route away from us at a cost to them to make this point. They are also working with other exchanges to make similar tiers with them.

Id. at 21-22. Albers testified, as to the second point above, that not only did ██████ route their order flow away, but that “they reduced their server consumption of Depth-of-Book information . . . [and Nasdaq] lost about 50 percent of the nondisplay market data usage as well.” Tr. 513. By this point, the ██████ threat was so serious that Albers and his team prepared a briefing for the CEO of Nasdaq. Tr. 514; Nasdaq Ex. 507.

The order flow diverted by ██████ was and, as of the date of the hearing, continued to be substantial. *See* Nasdaq Ex. 619. In the first five months of 2012, ██████ trading volume on Nasdaq averaged approximately 1.2 billion shares a month. *Id.* ██████ voiced its intense displeasure at the new fees in May 2012. *See* Nasdaq Exs. 505, 506. Starting in June 2012, and continuing up until the month preceding the hearing, ██████ trading volume on Nasdaq averaged approximately 610 million shares a month, or 50% of the prior amount. Nasdaq Ex. 619; *see also* Tr. 1202.

The record also contains examples where the Exchanges constrained depth-of-book prices in order to attract or maintain order flow. For example, in an attempt to attract order flow from ██████, Nasdaq gave it a substantially discounted fee cap on depth-of-book data, which was successful in drawing order flow for only a few months. Tr. 518-524; Nasdaq Exs. 502-03. Furthermore, Brooks testified that both Pico Trading and Lime Brokerage threatened to shift order flow away from NYSE Arca in response to price changes. Tr. 73-75. Jump Trading, one of Nasdaq’s largest depth-of-book clients, also responded to a price increase for a related, non-data product service, by warning Nasdaq that “[i]ncreased fees . . . always affect the trading volume in a negative way.” Tr. 537-39; Nasdaq Ex. 606; SIFMA Ex. 125 at 627. Hudson River Trading, another large client, made a similar threat in response to TotalView fees, and forced Nasdaq to institute a cap on fees in order to preserve their business. Tr. 529-33; SIFMA Ex. 125 at 627. Albers testified that he receives threats to move order flow from his customers all the time, but that ██████ and Jump Trading were among the few that put their threats in writing. Tr. 537.

Discussion of additional arguments

Pricing on the inelastic portion of the demand curve is unpersuasive

NYSE Arca maintained that it priced its depth-of-book product on the inelastic part of the demand curve, seeking to maximize revenues from a portfolio of products, *i.e.* depth-of-book data *and* order flow. NYSE Arca Br. at 26. SIFMA responded by arguing that order flow faced intense competition (elastic demand), and depth-of-book data faced less competition (inelastic demand) and that the Exchanges kept prices of depth-of-book data high and used the profits to subsidize prices in the highly competitive order flow market. SIFMA Br. at 41.

NYSE Arca's argument is based on conjecture. And Brooks, its in-house witness, did not mention this possibility in his testimony. I also find SIFMA's position unpersuasive because it presents no evidence in support of the theory that NYSE Arca kept depth-of-book prices high to subsidize order flow costs. SIFMA Ex. 377 at 13683-84.

For these reasons, I find arguments about the Exchanges pricing on the inelastic portion of the demand curve unpersuasive.

The regression analysis merits consideration

NYSE Arca also claimed that a regression analysis demonstrates that its share of order flow declined when it began charging for ArcaBook. NYSE Arca Br. at 24. Hendershott's regression analysis sought to measure the NYSE Arca loss of order flow as a result of the January 2009 ArcaBook price increase, and it did so by measuring NYSE Arca's share of total market and exchange-based trading volume in three- and six-month intervals before and after January 2009. NYSE Arca Ex. 65 at 1566-67, 1586. The regression analysis showed that after NYSE Arca began charging for ArcaBook in January 2009, its share of order flow declined by 11.7% relative to the rest of the market and 9.8% relative to the rest of the traditional exchanges' trading volume. NYSE Arca Br. at 24; Tr. 280-81.

SIFMA accuses NYSE Arca's regression analysis of containing several fatal flaws. SIFMA Br. at 38-40. First, it noted that BATS became a national securities exchange in October 2008, and that that event alone caused NYSE Arca's share of total *exchange*-based trading volume to drop.⁴³ SIFMA Ex. 377 at 13697; Tr. 202-04, 284-86. Therefore, SIFMA is correct that the 9.8% fall in NYSE Arca's share of total exchange-based trading volume is overstated. However, the BATS issue had no impact on NYSE Arca's 11.7% fall in its share of total *market* trading volume. Tr. 204, 285.

SIFMA is also correct that the regression analysis merely shows "a link," not a causative relationship, between an increase in depth-of-book prices and a decline in order flow. Tr. 280; SIFMA Br. at 38; *see also* Andrew Dick & Peter Boberg, *Regression Analysis*, ABA Antitrust Magazine, Fall 2005 ("[A]s is widely recognized . . . regression analysis can help find and quantify relationships between variables, [but] regressions cannot explicitly determine causation or prove causality between those variables."). In addition, NYSE Arca does not deny SIFMA's claim that its share of trading volume was declining even before the January 2009

⁴³ When BATS became a securities exchange in October 2008, the regression analysis began counting BATS's trading volume in the denominator for total exchange-based trading volume, causing NYSE Arca's total share to drop. SIFMA Ex. 377 at 13697-98.

implementation of ArcaBook pricing. SIFMA Br. at 39. Nonetheless, I reject SIFMA's claim that NYSE Arca should have commissioned other regression analyses to show the impact of other NYSE Arca depth-of-book price increases. SIFMA Br. at 39-40. The fact that NYSE Arca did not submit more evidence does not detract from the worthiness of the evidence it submitted.

On balance, I find that the regression analysis supports the limited finding that NYSE Arca's market share of trading volume materially declined in the six months following its initial pricing of ArcaBook.

SIFMA's objections

SIFMA contended that the Exchanges failed to show that their depth-of-book fees significantly affect order flow because they provided evidence of only one customer who shifted order flow in response to a depth-of-book fee increase, and that this falls far short of carrying the Exchanges' burden for numerous reasons. SIFMA Br. at 35. Moreover, that customer did not persuade Nasdaq to rescind the fee increase, and Nasdaq recognized that the customer was harming itself by diverting orders. *Id.* SIFMA argued further that traders, because of order execution obligations, have limited ability to "punish" the Exchanges for raising depth-of-book prices by shifting their order flow elsewhere because doing so would violate the duty of best execution and Reg. NMS. *Id.* at 7, 34. Donefer argued that if a broker purposely chose not to route trades to a particular exchange in order to punish it for raising depth-of-book prices, the quality of the broker's order executions would decline, clients would notice, and the broker may lose business. SIFMA Ex. 376 at 13585-86. SIFMA also argued that a trader, trading for itself, would incur a cost in forgone profits if it chose to route orders away from the exchange with the most profitable trading opportunities. SIFMA Br. at 34. Finally, SIFMA argued that competition for order flow has actually *increased*, not decreased, depth-of-book prices. *Id.* at 40-47.

SIFMA's many arguments are unpersuasive. The fact that one customer actually pulled order flow is not dispositive, but is persuasive when together with evidence that the Exchanges are constrained in their pricing by the *threat* of pulling order flow. The one example of a customer pulling order flow, the many customer threats, and Albers' testimony that threats occur "all the time," are persuasive evidence that certain depth-of-book customers recognize the leverage gained by their control over order flow, and have attempted to use it to drive down or stabilize depth-of-book prices. *See* Nasdaq Ex. 505 at 13 ("This simple relationship between market data and order flow should resonate with all your clients."). Furthermore, as provided both by Albers' testimony and various Nasdaq documents, it is obvious that the Exchanges take these threats seriously. Also, that Nasdaq stood firm in response to the backlash from one customer does not mean it is not competitively constrained in setting its prices.⁴⁴ Moreover, Albers provided two examples, ██████████ and Hudson River Trading, where concern over a potential loss or gain of order flow caused Nasdaq to reduce its depth-of-book prices. Tr. 518-20, 529-33.

⁴⁴ Additionally, Albers testified that Nasdaq went back to ██████████ with some proposals to resolve their differences, but ██████████ rejected those proposals. Tr. 645.

The evidence does not support SIFMA's claims that traders cannot shift order flow due to best execution or Reg NMS obligations.⁴⁵ For one, ██████ explicitly stated that it would shift order flow without impacting its best execution obligations. Nasdaq Ex. 507 at 13. The fact that ██████ appears to have pulled order flow for well over two years further demonstrates the ability to shift order flow without running afoul of best execution or any other obligations. Nasdaq Ex. 507 at 13-14. Furthermore, Donefer admitted that traders can also route their orders through wholesalers, instead of securities exchanges, and those wholesalers will guarantee that all best execution standards are in effect. Tr. 936-38; SIFMA Ex. 369 (showing that in the fourth quarter of 2014, ██████ routed all of its trades through wholesalers, rather than exchanges).

I find that the record evidence persuasive that the Exchanges' largest customers, such as the one hundred firms, constrain the Exchanges' pricing of depth-of-book data by routing or threatening to route order flow elsewhere.

The Exchanges' evidence satisfies the *NetCoalition I* standard

Order flow

NetCoalition I was dismissive of the Commission's finding that order flow was a restraint on depth-of-book pricing for two reasons. One, because the Commission's explanation that depth-of-book data were unimportant to most traders was "at odds" with the idea that "wide distribution of the data to many market participants" was critical in attracting order flow. *NetCoalition I*, 615 F.3d at 540. The Commission noted this

'apparent contradiction' could be resolved if 'evidence of the traders using NYSE Arca's depth-of-book data' and 'the percentage of total trading volume those traders may generate' showed that a small but influential group of professional traders were interested in ArcaBook data.

SIFMA, 2014 SEC LEXIS 1686, at *11 n.27 (citing *NetCoalition I*, 615 F.3d at 541 n.14). The apparent contradiction is resolved here by undisputed evidence that there are about 85,000 subscribers to Nasdaq's depth of book products, but around one hundred firms – of the 30,000 subscribers to Nasdaq's TotalView – account for about 90% of Nasdaq order flow. Tr. 409-10, 450; *see also* Tr. 1013-14 (SIFMA expert agrees that one hundred firms account for about 90% of order flow).

⁴⁵ SIFMA filed a notice of supplemental authority, attaching Financial Industry Regulatory Authority (FINRA) regulatory notice 15-46 and arguing that the notice confirms that "depth-of-book data products may be necessary to satisfy a broker-dealer's duty of best execution" and that "best execution obligations constrain" brokers' ability to route order flow away from Exchanges. SIFMA Supp. Br. at 1-2 (filed Nov. 25, 2015). The FINRA notice confirms neither proposition. It merely states that a broker-dealer that subscribes to depth-of-book data fees would be expected to use those fees to determine best execution for customer orders. FINRA Notice at 3 n.12. It then states that routing decisions should not be *unduly* influenced by fees or rebate structure. *Id.* at 6.

Second, and “more problematic,” to the court was the failure of the evidentiary record to support the conclusion “that order flow competition constrains market data prices,” because the record contained little beyond “self-serving views,” in the form of banal acknowledgments, “of the regulated entities,” and some anecdotes concerning rival securities exchanges. *NetCoalition I*, 615 F.3d at 541. The record here is markedly better because it contains evidence from persons with the regulated entities, given under oath, of an exchange lowering prices on its depth-of-book data to attract or retain order flow. It contains evidence of traders threatening to shift order flow elsewhere if depth-of-book prices go too high. It contains evidence of a trader shifting substantial order flow in order to punish an exchange for raising depth-of-book prices. And finally, it contains evidence that these threats occur frequently, and that they were treated seriously by the Exchanges.

I reject SIFMA’s claim that the record contains nothing more than “cherry-picked vignettes from which it is impossible ‘to draw valid statistical inferences.’” SIFMA Br. at 35. Statistical evidence is not required to resolve every dispute. The Exchanges have presented persuasive evidence establishing that their ability to price their depth-of-book products is constantly under pressure from their biggest customers, and those customers’ ability to control order flow. That is enough. I find the Exchanges have carried their burden of showing that their depth-of-book prices are constrained by order flow competition.

Existence of substitutes

NetCoalition I was also dismissive of the Commission’s finding that depth-of-book pricing was constrained by other alternative data products, including depth-of-book data from other exchanges, core data, “pinging orders,” and the “threat of independent distribution of depth-of-book data by data vendors or securities firms acting in concert.” 615 F.3d at 542. *NetCoalition I* found “insufficient evidence . . . to conclude that a trader interested in depth-of-book data would substitute any of the four alternatives (or simply do without) instead of paying a supracompetitive price.” *Id.* at 544. In particular, the court was unsure if depth-of-book data from other exchanges could even serve as an alternative, stating that such “determination cannot be made without knowing how actively the security is trade[d] on those exchanges.” *Id.* at 543.

This criticism does not apply here because this record is superior to *NetCoalition I* as to substitutes. For one, the evidence established that most securities are traded widely across all exchanges, meaning that depth-of-book data from rival exchanges can serve as substitutes for some traders. There is evidence that traders switch between depth-of-book products with relative frequency, with up to 41% of Nasdaq’s depth-of-book customer base dropping or adding the product each year. The Exchanges have also identified dozens of depth-of-book customers who have switched between depth-of-book products from rival exchanges.

In analyzing alternatives, *NetCoalition I* would find helpful evidence of trader behavior in the face of “a supracompetitive price” for depth-of-book data. 615 F.3d at 543. However, nothing in this record suggests that the Exchanges set depth-of-book data at a supracompetitive price. Instead, the record is that for most customers, depth-of-book prices, once set, have been mostly unchanged or even decreased. Moreover, substantial evidence shows that the Exchanges

worry about setting prices too high and losing customers to rivals. Additionally, the record contains evidence of trader behavior in response to a dramatic decrease in depth-of-book prices.⁴⁶

Taken as a whole, the record overcomes the evidentiary deficiencies noted in *NetCoalition I*. In conclusion, this record supports the Exchanges' position that their depth-of-book fee rules are constrained by significant competitive forces and that the Exchanges provided a "substantial basis" demonstrating that the fees are equitable, fair, reasonable, and not unreasonably discriminatory.

There is no substantial countervailing basis to find otherwise

In 2008, the Commission concluded that there was no substantial countervailing basis to disapprove the 2006 ArcaBook Rule, noting that: (1) the proposed fees would apply equally to all subscribers; (2) NYSE Arca's proposed fees were less than the NYSE fee for data in NYSE-listed stocks and less than the Nasdaq fee for data in all NMS Nasdaq-listed stocks; and (3) initial market data revenue from ArcaBook of less than \$8 million would likely remain in 2006 close to the 17% of NYSE Arca's total revenue figure from 2005; fees for ArcaBook data were projected to be a small portion of NYSE Arca's market data revenues and a smaller portion of NYSE Arca's total revenues. 2008 ArcaBook Order, 73 Fed. Reg. at 74794-95.

The factors that applied in 2008 apply now as well. As to (1), depth-of-book data is available to anyone on a fair and reasonable non-discriminatory basis and the proposed fees apply to all similarly situated subscribers. Tr. 384-85, 617-18; NYSE Arca Ex. 65 at 1548. As to (2), no SIFMA member testified that the proposed fees were too high, unjust, or unreasonable. The parties agree that they face fierce competition for order flow, and the persuasive evidence is that this competition, and the existence of substitutes, constrains the Exchanges' depth-of-book data rates. As to (3), data products, of which depth-of-book products is one component, account for 19% of Nasdaq's total revenue, only 2% higher than the percentage for NYSE Arca in 2005 and 2006. Tr. 388-89; Nasdaq Ex. 605 at 1102.

SIFMA argued that the record is replete with evidence providing a substantial countervailing basis for disapproving the fees. SIFMA Br. at 58. It contended that depth-of-book fees cause retail brokers to limit the depth-of-book products made available to their customers, which puts retail investors at an informational disadvantage compared to investors who can afford to buy multiple depth-of-book products. *Id.* I find this argument unconvincing and contradicted by SIFMA's own expert. Donefer, a retail investor with four brokerage accounts, was unconcerned as to whether any of those brokers had access to depth-of-book data, because they would route their orders to a wholesaler that did. Tr. 986-89. Moreover, the evidence is that nearly every trade executes at NBBO, so that in almost all circumstances, retail investors do not need depth-of-book data, much less depth-of-book data from every exchange.

⁴⁶ When Nasdaq halved the prices in 2003, subscriber numbers skyrocketed. Tr. 453; Nasdaq Ex. 511 at 37.

SIFMA also argued that high depth-of-book data fees paid by broker-dealers increased overall costs for ordinary investors. SIFMA Br. at 59. But, aside from some assertions by Donefer, this argument is unsupported. While it is plausible that fees imposed by the Exchanges may ultimately affect costs for investors, SIFMA must do more than speculate for that increase in costs to be a “substantial countervailing basis.” Finally, SIFMA provided no evidence to support its claim that lower depth-of-book fees would lead to greater transparency, efficiency, and fairness. *Id.* at 59-60.

Considering the evidence as a whole, I find that the Exchanges have shown their rules on depth-of-book fees are consistent with the purposes of the Exchange Act, and SIFMA has not shown a substantial countervailing basis to that outweighs that finding.

RECORD CERTIFICATION

I certify that the record includes the items set forth in the revised record index issued by the Secretary of the Commission on January 12, 2016. *See* 17 C.F.R. § 201.351(b).

ORDER

For the reasons set forth above, I REJECT the challenges of the Securities Industry and Financial Markets Association, filed pursuant to Section 19(d) of the Securities Exchange Act of 1934, to the rules changes affecting non-core market dated filed by NYSE Arca, Inc., and Nasdaq Stock Market LLC.

I ORDER that this initial decision shall become effective in accordance with and subject to the provisions of Rule 360 of the Commission’s Rules of Practice, 17 C.F.R. § 201.360. Pursuant to that Rule, a party may file a petition for review of this initial decision within twenty-one days after service of the initial decision. A party may also file a motion to correct a manifest error of fact within ten days of the initial decision, pursuant to Rule 111 of the Commission’s Rules of Practice, 17 C.F.R. § 201.111. If a motion to correct a manifest error of fact is filed by a party, then a party shall have twenty-one days to file a petition for review from the date of the undersigned’s order resolving such motion to correct a manifest error of fact. The initial decision will not become final until the Commission enters an order of finality. The Commission will enter an order of finality unless a party files a petition for review or a motion to correct a manifest error of fact or the Commission determines on its own initiative to review the initial decision as to a party. If any of these events occur, the initial decision shall not become final as to that party.

Brenda P. Murray
Chief Administrative Law Judge