March 21, 2010

Via Electronic Mail (rule-comments@sec.gov)

U.S. Securities and Exchange Commission
100 F Street, N.E.
Washington, DC 20549-1090
Attention:
Elizabeth M. Murphy, Secretary

COMMENT LETTER AND PETITION FOR DISAPPROVAL

Re: The NASDAQ Stock Market LLC; Suspension of and Order Instituting Proceedings To Determine Whether To Approve or Disapprove a Proposed Rule Change To Link Market Data Fees and Transaction Execution Fees, Release No. 34-63796; File No. SR-NASDAQ-2011-010; 76 FR 6165 (Feb. 3, 2011) (the "Suspension").

Dear Ms. Murphy:

The Securities Industry and Financial Markets Association ("SIFMA")[1] and NetCoalition appreciate the opportunity to comment on the above-captioned Suspension, wherein the Securities and Exchange Commission (the "Commission") temporarily suspended and instituted proceedings to determine whether to approve or disapprove, pursuant to Section 19(b)(C)(3) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"),[2] a rule change proposed by the Nasdaq Stock Market LLC ("Nasdaq" or the "Exchange") to discount its depth-of-book data products and provide an "enhanced" liquidity-provider rebate based upon the extent to which an Exchange member, in offering services to non-professional investors, consumes Exchange data and provides liquidity to the Exchange (the "Rule Change").[3] For the reasons set forth below, and because the Exchange's actions are inconsistent with the recent decision of the United States Court of Appeals for the District of Columbia Circuit in *NetCoalition v. Securities*

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1 The Securities Industry and Financial Markets Association (SIFMA) brings together the shared interests of hundreds of securities firms, banks and asset managers. SIFMA's mission is to develop policies and practices which strengthen financial markets and which encourage capital availability, job creation and economic growth while building trust and confidence in the financial industry. SIFMA, with offices in New York and Washington, D.C., is the U.S. regional member of the Global Financial Markets Association (GFMA).

2 15 U.S.C. § 78s(b)(C)(3) (2010).

3 *Self-Regulatory Organizations*; The *NASDAQ Stock Market LLC*; *Notice of Filing and Immediate Effectiveness of Proposed Rule Change to Reduce Market Data Fees and Transaction Execution Fees for Retail Investors*, Release No. 34-63745; File No. SR-NASDAQ-2011-10; 76 Fed. Reg. 4970 (Jan. 27, 2011).

and Exchange Commission,[4] we respectfully request that the Commission disapprove the Rule Change.

NetCoalition and SIFMA applaud the Commission on the suspension of the Rule Change. As we have previously argued, the Commission should not be accepting rule change filings as complete, and those rule changes should not be allowed to become effective upon filing, if on their face they are unlawful or have not been justified by legally sufficient information.[5] The Rule Change at issue here is unlawful because it is based on invalid grounds, omits cost data, and otherwise fails to comport with the Exchange Act as interpreted by the Court in *NetCoalition*. We therefore urge the Commission to disapprove the Rule Change

I. **The Exchange Has Not Shown That The Market Data Fees Are Constrained By Competitive Forces.**

The Commission has acknowledged that "it obviously would be inappropriate for the Commission to rely on non-existent competitive forces as a basis for approving an exchange proposal."[6] An exclusive processor, such as Nasdaq,[7] enjoys a government-conferred regulatory monopoly over market data that broker-dealers are required by law to provide to them for free. Accordingly, its fee proposals should be granted, if at all, only on the clearest evidence that actual, not theoretical, competition effectively constrains the exchange's pricing power. Here, Nasdaq relies entirely on unsubstantiated and analytically flawed theory and speculation to support its contention that significant competitive forces constrain the pricing of its depth-of-book products. Furthermore, Nasdaq does not support its proposal with any evidence of the cost of collecting and distributing the market data, despite the ruling in *NetCoalition* that the "costs of collecting and distributing market data can indicate whether an exchange is taking 'excessive profits' or subsidizing its service with another source of revenue."[8]

Nasdaq primarily advances the conclusory "joint products" theory to justify its fees for depth-of-book data, despite the fundamental errors in this theory and the lack of any evidence to support it. Moreover, this theory essentially eliminates any oversight function by the Commission of any fee charged by any exchange. Because the alleged constraints of "joint products" will *always* exist, acceptance of Nasdaq's argument means that *any* fee proposed by an exchange for the use of *any* of its facilities, whether market data or otherwise, will be deemed valid and not subject to challenge. The result would be a lack of any semblance of review by the Commission and an abdication of its supervisory role in assessing the fairness and reasonableness of an exchange's facility charges.

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4 615 F.3d 525 (D.C. Cir. 2010).

5 *See* Comment Letter of SIFMA and NetCoalition at 2-3 (Dec. 8, 2010), available at http://www.sec.gov/comments/sr-nysearca-2010-97/nysearca201097-1.pdf

6 73 Fed. Reg. 74770, 74787 (Dec. 9, 2008).

7 *See* 15 U.S.C. § 78c(a)(22)(B); *NetCoalition*, 615 F.3d at 531.

8 615 F.3d at 537.

A. **The Notice does not supply the cost data called for by the *NetCoalition* Court.**

Although Nasdaq has not submitted cost data to support its assertions of competitive pricing, it does not and cannot dispute the relevance of such data. The Court in *NetCoalition* held that the costs incurred in "collecting and distributing" depth-of-book data itself are relevant in assessing the reasonableness of the fees an exchange charges for the data.[9] As the Court stated:

> Supracompetitive pricing may be evidence of "monopoly," or market power . . . Thus the costs of collecting and distributing market data can indicate whether an exchange is taking "excessive profits" or subsidizing its service with another source of revenue . . .[10]

Thus, the cost of "collecting and distributing" market data would be direct, if not the best, evidence of whether competition constrains the price Nasdaq can charge for the data. Moreover, as the *NetCoalition* Court found, the need for cost data "appears to be elevated" because of the risk that Nasdaq, as an "exclusive" provider of its proprietary depth-of-book market data, could exercise market power.[11] Yet the Exchange did not provide any such cost data.

The reason such cost data has been omitted is obvious. As Nasdaq concedes, the cost of providing its depth-of-book data is "small, or even zero."[12] The Exchange contends, instead, that it is its high fixed costs that are relevant. Those fixed costs, however, appear to be driven principally, if not totally, by its trading services. Indeed, according to the Exchange, it should be allowed to "recapture," through market data fees, the "millions" it spends on operations, including on trade executions.[13] Notwithstanding the fact that the Exchange ignores the teachings of the *NetCoalition* Court and substitutes its own, partisan concept of what costs are relevant, the Notice in no way actually substantiates what those costs actually are.[14] Nowhere does the Notice supply any evidence of costs of trade executions, collecting and distributing data, or anything else. The Notice, therefore, does not provide the type of evidence the *NetCoalition* Court found to be necessary to sustain the Commission's approval of an exchange rule seeking to impose a market data fee.[15] In any event, the *NetCoalition* Court did not recognize the costs of maintaining a securities platform as relevant for the purpose of assessing the fairness or reasonableness of any resulting market data and the Commission should reject the proposition that such costs are relevant for that purpose.

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9 615 F.3d at 537.

10 615 F.3d at 537.

11 615 F.3d at 538.

12 76 Fed. Reg. at 4973-74.

13 76 Fed. Reg. at 4972-74. In arguing that it should be able to "recapture[] the cost of operating its platform through the sale of both executions and market information," Nasdaq ignores other important sources of revenue, such as member fees and listing fees.

14 *See, e.g., Statement of Janusz Ordover and Gustavo Bamburger* ¶¶ 35-37 (Dec. 29, 2010) ("O-B Statement") (citing the "substantial cost" of producing market data, without elaborating on what those costs actually are).

15 *See* 615 F.3d at 537.

The Commission should require the Exchange to submit cost data sufficient to demonstrate the fairness and reasonableness of the proposed fees. To that end, we urge a straight-forward and specific definition of which costs should be included in such an analysis: the cost of collecting, and distributing the data. Other costs reflect the exchange's competitive activities and should be funded by those activities, namely listing fees, trading fees, and related regulatory fees. It is inappropriate for fees for exclusive market data products sold to a captive audience to subsidize the exchange's competitive products.

B. <u>The Exchange's "joint products" theory is fundamentally flawed.</u>

The Exchange primarily relies on the asserted "joint products" theory to purport to explain why its fees are fair and reasonable. Under a "joint products" approach to pricing, market data and trade executions are viewed as "joint" products and are priced in the aggregate.[16] Under such a theory, an exchange could theoretically price its data fees higher and execution fees lower, or vice versa, but would be constrained by competitive forces from pricing those fees in the aggregate above the price of both products offered by other exchanges or trading venues.[17] This approach to pricing depth-of-book data is inherently flawed and cannot be the basis for the conclusion that the fees at issue are fair and reasonable.

First, the "joint products" approach is inconsistent with Section 11A(c)(1)(C) of the Exchange Act.[18] The theory is that exclusive processors may set depth-of-book data prices that exceed competitive levels as long as they charge less for other services. Nasdaq claims that "there is no basis in the Act for requiring these inextricably linked products to be priced in isolation from one another."[19] But just because products are bundled together does not mean that the individual components are competitively priced or constrained by competitive forces.[20] The joint-product theory is effectively slight of hand that, if accepted, would immunize market data fees from any effective review because it would never be possible to sort out how the fees related to any concrete evidence of fairness. Allowing so-called "joint products" to immunize monopolistically priced data fees from review by wrapping them together with fees for other services would nullify the "fair and reasonable" requirement in the Exchange Act. A Commission finding of fairness and reasonableness on such a basis would never be supported by the "substantial evidence" contemplated by Exchange Act Section 25(a)(4).

Second, the Exchange's attempt to advance an aggregate cost structure for its depth-of-book data that includes the cost of producing all of an exchange's products contravenes the *NetCoalition* decision. The *NetCoalition* Court made clear that, in assessing the fairness and reasonableness of market data fees, the pricing and accompanying costs of *market data itself* is what is relevant, not some aggregation of market data with the costs of all of an exchange's other products and facilities. *See* 615 F.3d at 537 ("Thus, the costs of collecting and distributing *market data* can

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16 *See* 615 F.3d at 541 n.16.

17 *See* 76 Fed. Reg. at 4972.

18 15 U.S.C. § 78k-1(c)(1)(C).

19 76 Fed. Reg. 4972 n.11.

20 *See Response To Ordover And Bamberger's Statement Regarding Nasdaq's Proposed Rule Change Concerning The Pricing Of Depth-Of-Book Market Data* at 24-27 (March 21, 2011) ("*Response*") (attached hereto as Exhibit 1).

indicate whether an exchange is taking 'excessive profits' or subsidizing its service with another source of revenue"); *id*. at 538 (noting "the risk that NYSE Arca could exercise market power appears to be elevated in the pricing of its *proprietary non-core data*"). The Exchange simply offers no support for its conclusion that exchange competition constrains *market data prices*.

Third, the platform theory is flawed as a matter of economics. Order-execution services and market data are bought and sold separately, at different times in different proportions and by different consumers. Indeed, for firms that act as intermediaries between trading platforms and the public but do not trade themselves, such as Google and Yahoo!, the price of depth-of-book data stands entirely on its own.[21] Similarly, retail investors who purchase or access market data through their broker-dealers to price their holdings and inform their trading do not make order routing decisions. Where two products are bought and sold separately, the price of each is the result of the distinct competitive conditions confronting each product, and competition for one does not constrain the pricing of the other.[22] The Exchange compares depth-of-book data and trade executions to wool and mutton because both sets of products share joint costs of production. However, it cannot seriously be thought that a competitive market for wool has any impact on the price of mutton, but the Exchange argues just that with respect to market data and trade execution.[23]

Fourth, Nasdaq's "joint products" theory wrongly assumes that traders can (or would) readily switch orders to another "platform" in response to a price increase in market data, and thereby lower their overall trading costs. An increase or decrease in the monthly subscription fee for depth-of-book data will not change a trader's marginal cost to purchase or sell a particular security on a particular exchange because the decision to purchase the data is made before and independent of the decision to trade. That is, for those who can afford it, market data is a fixed cost of trading; directing trade execution to a different platform will not save the trader the costs of purchasing market data from the first platform.[24] And for those investors who purchase only market data from a platform and no other services, there is no aggregate cost of using an exchange, just the cost of the data it purchases. Their only choice is to pay the non-discounted data prices – prices that subsidize other exchange costs – imposed by the exchange or stop buying the data entirely.

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21 *See Response* at 26-27

22 *See Response* at 24-25; *see also Gartenberg v. Merrill Lynch Asset Mgmt., Inc.*, 694 F.2d 923, 929 (2d Cir. 1982) ("Competition between money market funds for shareholder business does not support an inference that competition must therefore also exist between adviser-managers for fund business. The former may be vigorous even though the latter is virtually non-existent. Each is governed by different forces.").

23 *See Response* at 24-25. Nasdaq's "joint product" theory is further undermined by Nasdaq's contention that the pricing of each joint product – order flow and market data – is constrained by market forces within each respective market. *See* 76 Fed. Reg. at 4973, 4977. If that were the case, it is unlikely that we would see other platforms charging such divergent prices for what the Exchange argues are similar products. Instead, such divergent pricing demonstrates that each exchange has market power and may try different pricing models without fear of a competitive response from other exchanges.

24 *See Response* at 11-12, 16.

Finally, Nasdaq provides no actual evidence to support its platform competition theory. The *NetCoalition* Court vacated the Commission's order in that case because there was no evidence to support the Commission's theories as to pricing constraints.[25] Once again we are confronted with the same problem. Nasdaq has provided no evidence that the markets for depth-of-book data and order flow are linked in the way and to the extent described by Nasdaq. Nasdaq cites approvingly tables and charts recently included in NYSE Arca's filing in support of its depth-of-book data fees, but the charts and tables only demonstrate that market share for order flow is volatile and changes dramatically. This is an already well-understood point, but a non sequitur when it comes to market data.[26] The Notice does not, and cannot, identify any such volatility in the market for depth-of-book data. That market shares for order flow and depth-of-book data do not move in tandem further demonstrates that these two products are not jointly bought and sold, undercutting the entire premise of the "joint products" theory.[27]

C. Nasdaq does not support its contention that there are alternatives to its depth-of-book data.

Nasdaq contends that "even though market information from one platform may not be a perfect substitute for market information from one or more other platforms, the existence of alternative sources of information can be expected to constrain the prices platforms charge for market data."[28] The Notice further argues that "no single exchange controls proprietary data that is indispensible to any particular market participant."[29]

The same substitutability argument was made in the *NetCoalition* case and rejected by the court because it was not supported by any evidence.[30] The *NetCoalition* Court insisted upon actual "evidence of trader behavior," such as "the number of potential users of the data or how they might react to a change in price,"[31] or "whether the traders who want depth-of-book data would decline to purchase it if met with a supracompetitive price."[32] With respect to whether the depth-of-book data from other exchanges could be an alternative for individual securities, the *NetCoalition* Court specifically stated that substitutability could not be determined "without knowing how actively the security is traded on those exchanges."[33] The Court's admonitions

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25 615 F.3d at 542-44.

26 76 Fed. Reg. at 4977 (citing *Self Regulatory Organizations; Notice of Filing and Immediate Effectiveness of Proposed Rule Change by NYSE Arca, Inc. Relating to Fees for NYSE Arca Depth-of-Book Data*, Release No. 34-63291; File No. SR-NYSEArca-2010-97 (Nov. 9, 2010); 75 Fed. Reg. 70311 (Nov. 17, 2010) (the "*NYSEArca Notice*")); *see* 615 F.3d at 541 ("The self-serving views of the regulated entities, however, provide little support to establish that significant competitive forces affect their pricing decisions.").

27 *See Response* at 21-22.

28 76 Fed. Reg. at 4977; *see also* O-B Statement ¶ 40.

29 *See* 76 Fed. Reg. at 4974.

30 615 F.3d at 542-43.

31 615 F.3d at 542-43.

32 615 F.3d at 542-43.

33 615 F.3d at 543.

notwithstanding, Nasdaq provides no evidence to support this argument and that alone is sufficient for the Commission to reject it.[34]

In fact, depth-of-book data from other trading venues simply are not an economic substitute for Nasdaq depth-of-book data. Each exchange's data are unique to that exchange.[35] Every vendor, Internet portal or broker-dealer seeking Nasdaq's depth-of-book data can buy it only from Nasdaq alone. And while market data for each exchange are sold as a package, trading is done by security, so a trader will need to buy several data packages to have a full picture of liquidity for a given security he or she wishes to trade. Thus, a trader who buys only Nasdaq's depth-of-book feed will be at a significant disadvantage when trading in stocks as to which NYSE (or any other exchange) has greater depth of book.[36]

In sum, to have a reasonably comprehensive picture of liquidity below the top of the book in a given security, investors need depth-of-book data from *all* exchanges with substantial trading in that security.[37] There can be no dispute that Nasdaq is a significant trading venue with substantial liquidity.[38] As the Commission itself has recognized, "an SRO with a significant share of trading in NMS stocks could exercise market power in setting fees for its data. Few investors could afford to do without the best quotations and trades of such an SRO that is dominant in a significant number of stocks."[39] In point of fact, of course, Nasdaq has a greater market share in certain securities than any other market. Any institutional investor or informed or active retail investor who trades or holds multiple equity securities cannot ignore those in which Nasdaq is the principal market and therefore must buy Nasdaq's available market data as a matter of necessity. The availability of depth-of-book data from other trading venues therefore does not effectively constrain the prices that significant venues such as Nasdaq can charge for depth-of-book data.

D. <u>There is no evidence that competition for order flow constrains the price of market data.</u>

Nasdaq cites approvingly the "[a]dditional evidence" submitted by NYSE Arca in its filing, SR-NYSE Arca-2010-97, which, the Exchange asserts, demonstrates that "competition for order

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34 615 F.3d at 542-43.

35 *See Response* at 12-13; *see also* 615 F.3d at 538 ("There is no dispute that NYSE Arca is the 'exclusive' provider of this data. While many exchanges sell Google stock, only NYSE Arca offers access to the Google limit orders included in its depth-of-book product, ArcaBook.").

36 *See Response* at 13. Indeed, Nasdaq's co-intervenor in the *NetCoalition* case, NYSE Arca, has acknowledged that "the displayed depth-of-book data of one trading center *does not provide a complete picture of the full market for the security*." Comment Letter of Mary Yeager, Corporate Secretary, NYSE Arca, Inc. at 17 (Feb. 6, 2007).

37 *See Response* at 13.

38 According to the Commission's own statistics in the *NetCoalition* case, Nasdaq reported 30.4% of the share volume in U.S.-listed equities during June 2008, the highest among all exchanges. *See* 73 Fed. Reg. at 74770, 74783, Table 1 (Dec. 9, 2008). For certain individual securities, the share volume can be above 80%.

39 70 Fed. Reg. 37496, 37559 (June 29, 2005).

flow can constrain the price of market data."[40] This "[a]dditional evidence" includes an article about Island ECN, various tables and graphs, and two decade-old reports commissioned by the NYSE.[41] Similar evidence was rejected by the *NetCoalition* Court and cannot be resuscitated here to support this proposed Rule Change.

The *NetCoalition* Court properly concluded that the Island ECN example merely shows that "depth-of-book market data is apparently important enough to at least some traders that it must be made available"; it "say[s] nothing about whether an exchange . . . is constrained to price its depth-of-book data competitively."[42] That a scholarly study documents this experience is of no moment, as it still fails to demonstrate that competition for order flow constrains the price of depth-of-book data.

The table and graphs included in NYSE Arca's filing largely concern volatility in volume of order flow. Such volatility only serves to emphasize the need for traders to buy depth-of-book data, and pay the fixed monthly subscription fee, from all exchanges prior to the point of trade execution. As discussed above, traders need to buy the unique depth-of-book data from any exchange with significant liquidity. The more volatile and unpredictable the liquidity of each exchange, the greater the need to buy *all* venues' data, in advance, to ensure a full picture of the liquidity available for a particular security on a particular venue if and when it comes time to place an order for that security. Greater demand for an exchange's unique depth-of-book data can only serve to increase that exchange's market power over the pricing of such data.

Lastly, the two reports commissioned by NYSE were both written in connection with the Commission's 2000 Concept Release on the Regulation of Market Information Fees and Revenues.[43] The reports are primarily arguments against strict cost-based pricing (not at issue here) and concern top-of-book data, not depth-of-book data. The *NetCoalition* Court found similar "evidence" – that is to say, unsubstantiated opinion by exchanges – unpersuasive.[44]

II. <u>The Proposed Rule Change Unfairly Discriminates Against Certain Users.</u>

Under the proposed Rule Change, Nasdaq members that provide trade execution services and depth-of-book data to non-professional investors can receive discounts on such products if certain threshold requirements are met relating to liquidity provision and data consumption.[45] These discounts are unavailable to firms that service professional investors or those entities that serve retail investors and purchase depth-of-book data but do not provide order-execution

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40 76 Fed. Reg. at 4977.

41 76 Fed. Reg. at 4977.

42 615 F.3d at 541.

43 *See* "Issues Surrounding Cost-Based Regulation of Market Data Prices," and "The Economic Perspective on Regulation of Market Data," available at http://www.sec.gov/rules/concept/s72899/buck1.htm.

44 *See* 615 F.3d at 541 (rejecting the Commission's reliance on the 2001 Advisory Committee Report).

45 *See* 76 Fed. Reg. at 4971.

services. This discriminatory pricing, as premised on the joint product theory, contravenes the Exchange Act and the rules promulgated thereunder and should not be allowed to stand.[46]

III. Conclusion

The Commission must require that the Exchange submit evidence, rather than theories and conjecture, before approving these or any other future market data fee filings. The failure to address the *NetCoalition* Court's concerns regarding the market forces test renders this market data rule filing unapproveable under Section 19(b)(3)(C).[47]

For the reasons set forth above, and given the absence of any cost data or other evidence supporting the Exchange's contention that the proposed data fees are constrained by competitive forces, we respectfully request that the Commission disapprove the proposed Rule Change.

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If you have any questions or you would like to discuss these matters further, please call Melissa MacGregor, Managing Director and Associate General Counsel at SIFMA at 202-962-7385.

Respectfully submitted,

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46 *See* 15 U.S.C. § 78K-1(c)(1)(D); 15 U.S.C. § 78f(b)(5); 17 C.F.R. 242.603(a)(2).

47 As noted above, Section 19(b)(3)(C) provides: "Any proposed rule change of a self-regulatory organization which has taken effect pursuant to subparagraph (A) or (B) of this subparagraph may be enforced by such organization to the extent it is not inconsistent with the provisions of this title, the rules and regulations thereunder, and applicable federal and state law."

EXHIBIT 1

RESPONSE TO ORDOVER AND BAMBERGER'S STATEMENT REGARDING NASDAQ'S PROPOSED RULE CHANGE CONCERNING THE PRICING OF DEPTH-OF-BOOK MARKET DATA

Dr. David S. Evans

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Chairman

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Lecturer

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Executive Director, Jevons Institute for Competition Law and Economics
Visiting Professor

March 21, 2011

I. INTRODUCTION

Nasdaq Stock Market, LLC ("Nasdaq") has requested that the Securities and Exchange Commission ("SEC") approve a proposed rule change (the "Proposal") concerning the fees it charges for its depth-of-book market data (also known as unconsolidated, or non-core, data). Specifically, Nasdaq proposed to provide a discount on the fees it charges its "non-professional" users for depth-of-book data products if they provide order flow above certain specified thresholds. Through this pricing structure, Nasdaq would bundle its depth-of-book data with its trade-execution services.

It is my understanding that it is Nasdaq's burden, as an "exclusive processor" of market data, to establish that fees for its depth-of-book data are "fair and reasonable" and "not unreasonably discriminatory."[1] I also understand that the SEC has adopted a "market-based" approach for evaluating whether depth-of-book data fees are "fair and reasonable" and that this approach was the subject of a decision last year by the United States Court of Appeals for the D.C. Circuit in *NetCoalition v. Securities and Exchange Commission* (the "*NetCoalition* Decision").[2]

This Response examines the conclusions set forth in the Statement from Janusz Ordover and Gustavo Bamberger, on which Nasdaq relies to argue that the fees it seeks to charge are constrained by competitive forces and thus "fair and reasonable."[3] Ordover and Bamberger claim that *any* price that Nasdaq, in its sole

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[1] *See* 15 U.S.C. § 78k-1(c)(1)(C)-(D); 17 C.F.R. § 242.603(a).
[2] 615 F.3d 525 (D.C. Cir. 2010).
[3] Statement of Janusz Ordover and Gustavo Bamberger (December 29, 2010) [hereinafter "Statement"].

discretion, seeks to charge for market data is constrained by significant competitive forces because Nasdaq confronts "platform competition."[4] Based on that premise, Ordover and Bamberger conclude that Nasdaq may charge high prices for market data – no matter how high those prices might be – because they supposedly are offset by relatively low prices for transaction services.[5] Indeed, Ordover and Bamberger state that "there is no need to regulate the pricing of proprietary data" given the "platform" competition on which they rely.[6] But that is contrary to what I understand to be the SEC's statutory mandate, which places special emphasis on the widespread availability of data and recognizes the value of these data for efficient financial markets.[7] As a result, Ordover and Bamberger's opinions are not relevant to the legal and regulatory context in which U.S. exchanges must operate.

Putting aside that Ordover and Bamberger's opinions are irrelevant, those conclusions are also not supported by the economics or evidence. According to

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[4] In the context of addressing Nasdaq's Proposal, I discuss whether Nasdaq's depth-of-book data prices are constrained by significant competitive forces within what I understand to be the regulatory framework for the SEC's assessment of the pricing of depth-of-book data. This is based on the SEC's "market-based" approach in NYSE Arca for assessing whether depth-of-book data fees are equitable, fair and reasonable; Nasdaq and Ordover and Bamberger are taking the same approach in connection with Nasdaq's Proposal. The SEC noted in NYSE Arca that "reliance on competitive forces is the most appropriate and effective means to assess whether terms for the distribution of non-core data are equitable, fair and reasonable, and not unreasonably discriminatory." *See* Order Setting Aside Action by Delegated Authority and Approving Proposed Rule Change Relating to NYSE Arca Data, SEC Release No. 34-59039, 73 Fed. Reg. 74770 (December 2, 2008) [hereinafter, "NYSE Arca Order"], at 74781. I understand that the SEC's regulatory mandate would not permit it to find that high depth-of-book data fees are fair and reasonable because they may be offset by low prices for transaction services.

[5] *See* Statement, *supra* note 3, ¶¶ 5-6, 23.

[6] *See* Statement, *supra* note 3, ¶ 5; *see also* ¶ 6 ("Regulatory forbearance is thus fully warranted in the absence of any showing that the pricing strategies will anti-competitively disadvantage rival platforms and some well-defined customer groups of the investing public.").

[7] The statute is consistent with the view that exchange-related data provide positive externalities for the financial markets, and that making these data widely available at fair and reasonable prices helps make financial markets more efficient. Individual producers of these data do not take these externalities into account in their pricing decisions.

Ordover and Bamberger, Nasdaq's depth-of-book data fees are constrained by competitive forces in three ways. First, Ordover and Bamberger claim that "the existence of alternative sources of information can be expected to constrain the prices platforms charge for market data."[8] Second, they claim that order flow competition constrains depth-of-book data prices because "a platform can be expected to use its market data product as a tool for attracting liquidity and trading to its exchange."[9] Third, in a restatement of the order-flow-competition argument, they assert that trading services and depth-of-book data are "joint products" the "total" price of which is constrained by the "total price of trading on rival platforms."[10]

Ordover and Bamberger made similar arguments in the context of the application by NYSE Arca to charge certain fees for its depth-of-data products that is the subject of the *NetCoalition* decision.[11] In that matter, I submitted two reports addressing those arguments, which I attach hereto as Exhibits A and B for the SEC's convenience.[12] As explained previously, and as I will explain below, Ordover and Bamberger's conclusions are wrong and the authors provide no meaningful factual support for any of them.

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[8] *See* Statement, *supra* note 3, ¶ 40.

[9] *See* Statement, *supra* note 3, ¶ 67.

[10] *See* Statement, *supra* note 3, ¶¶ 19, 38

[11] In the NYSE Arca matter, the SEC did not rely upon Ordover and Bamberger's reasoning in approving NYSE Arca's fees and the D.C. Circuit did not address their arguments on appeal. *See NetCoalition*, 615 F.3d at 542 n.16 (stating that the "total platform" theory "is not the theory of competition on which the SEC relied [in approving NYSE Arca's proposed fees] and it may not press it for the first time on appeal.").

[12] Dr. David S. Evans, An Economic Assessment of Whether "Significant Competitive Forces" Constrain an Exchange's Pricing of Its Depth-of-Book Market Data (July 10, 2008) [hereinafter "Evans First NYSE Arca Report"]; Dr. David S. Evans, Response to Ordover And Bamberger's Statement Regarding the SEC's Proposed Order Concerning the Pricing of Depth-Of-Book Market Data (October 10, 2008) [hereinafter, "Evans Second NYSE Arca Report"].

This Response is organized as follows. Section II provides relevant industry background and explains the fundamental characteristics of depth-of-book data, how they are used by traders, and how they are priced and sold.

Section III addresses Ordover and Bamberger's unsupported assertion that alternative sources of depth-of-book data act as a significant competitive constraint on the prices that a given exchange can charge for its depth-of-book data. Ordover and Bamberger have not undertaken any analysis to show that this is the case. Nor could they make such a showing because each exchange's depth-of-book data are unique to that exchange and traders must purchase such data from all exchanges with significant depth-of-book liquidity to know how much liquidity is available at what prices and where.

In Section IV, I show that Ordover and Bamberger's claim that competition for order flow acts as a significant competitive constraint on an exchange's pricing of its depth-of-book data is analytically flawed and factually inconsistent with how exchanges work. Depth-of-book data prices do not affect the marginal incentive to place orders and, therefore, do not significantly affect order-flow decisions. On the other hand, depth-of-book data revenue can be used to offset the costs of liquidity rebates and discounts that attract more order flow – as Nasdaq is now admittedly trying to do.

Finally, in Section V, I show that Ordover and Bamberger's "total return" analysis does not address the question of whether depth-of-book data fees are competitively constrained. Where two "joint products" of the same facility are sold as separate products and, there are limited substitutes for one of the products,

competition between the producers of the joint product (what Ordover and Bamberger call "platform competition") will not prevent the exercise of market power for that product.

II. INDUSTRY BACKGROUND

A. Importance of Depth-of-Book Data Following Decimalization

Nasdaq's Proposal concerns the prices of Nasdaq's depth-of-book data. Depth-of-book data consist of information regarding limit orders to buy stock at prices lower than, or to sell stock at prices higher than, the best prices on each exchange.[13] That is, depth-of-book data provide information on prices "below" the "top of the book" and the number of shares being offered at those prices. Top-of-book data, by contrast, provide information on the best prices available on each exchange and the number of shares being offered at those prices.[14]

The importance of depth-of-book data has increased significantly since the transition to "decimalization." Prior to decimalization, stock prices were measured in 1/16ths of a dollar, or 6.25 cents (and 1/8ths of a dollar before that). Starting in 2001, stock prices on U.S. exchanges were "decimalized," or quoted in one-cent increments. One of the main potential benefits of decimalization was the possibility of decreased spreads between the best bid and offer for a given security. On the other

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[13] NYSE Arca Order, *supra* note 4, at 74780.

[14] The SEC requires each exchange to report top-of-book data for each security, as well as data on the last sale of each security, to a central data processor, which then consolidates the data and disseminates it to market participants. The consolidated "core" data consist of (1) last sale reports on each security, (2) the current best bid and offer (price and number of shares available) for each security on each exchange, and (3) national best bid and offer across exchanges. *See NetCoalition*, 615 F.3d at 529.

hand, decimalization also resulted in a decrease in the number of shares offered for trading at the top of the book.

To take a simple example, prior to decimalization, a given stock could have been quoted at $19.9375 ($19 and 15/16ths), $20.00 or $20.0625 ($20 and 1/16ths). If traders wishing to buy that stock chose to offer the closest price point to their target prices, then all buy orders with a target price between $19.97 and $20.03 would be priced at $20.00.[15] And if no buyers had a target price at or above $20.03, then the top of the book for buy orders would be at $20.00 and would consist of all orders with a target price between $19.97 and $20.03.

With decimalization, the same stock could be quoted at $19.97, $19.98, $19.99, $20.00, $20.01, $20.02, and $20.03. The buy orders that would have been offered at the $20.00 price point prior to decimalization are spread among the seven price points between $19.97 and $20.03 after decimalization. If the highest target price among buyers is, for example, at $20.03, then the top of the book would be at $20.03 and would consist only of orders with target prices between $20.025 and $20.035. Prior to decimalization, orders with target prices between $19.97 and $20.025 would have been at the top of the book and would have been included in the consolidated tape data. With decimalization, these orders would instead be below the top of the book and included only in depth-of-book data.

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[15] Traders will not necessarily follow this strategy of choosing the closest price point to their target prices, and other factors associated with a transition to decimalization (such as a decrease in the bid-ask spread) would also affect trading decisions, but the example given is illustrative of the likely decrease in liquidity available at the top of the book. In addition, I note that the range of $19.97 to $20.03 given in the text is approximate; the exact range, $19.96875 to $20.03125, is slightly larger.

Decimalization therefore led to a significant decrease in the number of shares available for trading at the top of the book and correspondingly increased the importance of shares available for trading below the top of the book.[16] This change meant that larger orders were less likely to be filled at the top-of-book price and increased the value of depth-of-book data, which provide important information on the likely range of prices at which large orders may be filled.[17]

B. Importance of Depth-of-Book Data from Different Exchanges

Each exchange's depth-of-book data reflect the limit orders placed on that exchange, which differ materially from the limit orders placed on other exchanges. That is because different traders place different orders on different exchanges. Depth-of-book data from Nasdaq, for example, generally reflect different limit orders from depth-of-book data from NYSE or Direct Edge. If a trader placed each order on all available exchanges, it would risk having the same order filled on multiple exchanges, which could be a costly result. The depth-of-book data from one exchange therefore differs materially from the depth-of-book data from other exchanges.

To have a reasonably comprehensive view of liquidity below the top of the book, depth-of-book data from all exchanges with substantial depth-of-book liquidity are required. There are two main reasons for that fact.

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[16] *See NetCoalition*, 615 F.3d at 530, n. 7; NYSE Arca Order at 74780.

[17] *NetCoalition*, 615 F.3d at 530, n. 7; NYSE Arca Order at 74780 ("With the initiation of decimal trading in 2001, however, the value to market participants of non-core data, particularly depth-of-book order data, increased").

First, depth-of-book data from all exchanges with significant liquidity for a given security are important in making trading decisions for that security. Regulation NMS provides "trade-through protection" to the displayed "top-of-book" quotations.[18] A "trade-through" occurs when trades in one market center are executed at prices inferior to those another market center is offering at the same time. By offering trade-through protection, Regulation NMS protects the trader against choosing to execute a trade on an exchange with less favorable terms and guarantees execution at the best price available at the top of the book.

By contrast, no trade-through protection is afforded to quotations below the top of the book. Rather, for traders to identify the exchange on which the optimal price and volume are offered for a given security, and for an assessment of the likely price of a significant order, my understanding is that they must purchase and review the depth-of-book data from each trading venue with significant liquidity for that security. In the absence of such data, for the many orders that are unlikely to be filled at the top of the book, they might miss an opportunity to route an order at lower cost and/or have a more accurate estimate of the likely price of the order.

The Security Traders Association ("STA") has confirmed this marketplace reality. According to the STA, a broker-dealer needs the depth-of-book data from each significant venue on which a given security trades for a useful perspective of available liquidity:

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[18] Effective on August 29, 2005, SEC adopted Regulation NMS, which contains four interrelated proposals. The "Order Protection Rule" or so-called "Trade-Through Rule", as one of the four proposals, requires trading centers to obtain the best price for investors when such price is represented by automated quotations that are immediately accessible. *See* http://www.sec.gov/rules/final/34-51808.pdf .

> We do not believe that the depth-of-book feeds from the various exchanges are fungible. Depth-of-book feeds are not substitutes for one another: NASDAQ's depth-of-book data for IBM will be different from the NYSE depth-of-book data for IBM. On the contrary, each depth-of-book data feed reflects the market conditions for a particular security on that particular venue. For a full appreciation of the liquidity available in the entire marketplace . . . as a commercial and competitive matter, a broker-dealer needs the depth-of-book feeds from each significant venue on which the security trades.[19]

The consequences of a trader's not purchasing the depth-of-book data for a major center of liquidity, such as Nasdaq, can be substantial. A broker-dealer without depth-of-book data from Nasdaq will have a materially incomplete view of the available volume and prices in a given security. The availability of NYSE volumes and prices for that security is in no meaningful sense a substitute for the different Nasdaq volume and prices.

Indeed, the broker-dealer that forgoes Nasdaq depth-of-book data could have significantly higher costs of trading and may fail to make profitable trades it would otherwise make because it did not know about available liquidity on Nasdaq. Such traders would face significant competitive pressure from other traders that did purchase the Nasdaq depth-of-book data and demonstrate substantially superior results.

Simply put, a broker-dealer cannot ignore the depth-of-book data available from the leading trading venues. And, as Ordover and Bamberger acknowledge, "all

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[19] Bart M. Green & John Giesea, STA Comment Letter at 3 (Sept. 11, 2008), http://www.sec.gov/comments/34-57917/3457917-15.pdf [hereinafter "STA Comment Letter"].

else equal, the deeper is the 'depth-of-book' information on an exchange, the more valuable it is."[20]

The second reason that traders value depth-of-book data from each exchange with significant depth-of-book liquidity is that exchanges vary in the available liquidity for different securities and thus in the ability of traders to actually consummate trades on those exchanges. Securities for which Nasdaq is the primary center of liquidity will differ from those for which NYSE or NYSE Arca is the primary center of liquidity. For example, in October 2010, for Tape A securities (for which NYSE is the initial listing exchange), NYSE had about 1.9 times the volume of trading that Nasdaq did, and NYSE and NYSE Arca combined had about 2.9 times the volume of trading that Nasdaq did.[21] Similarly, for Tape C securities (for which Nasdaq is the initial listing exchange), Nasdaq had about 2.2 times the volume of trading that NYSE Arca did. For many individual securities, the differences would be even greater. This reinforces the fact that an asset manager seeking broad diversification in its equity portfolio cannot ignore either NYSE or Nasdaq or assume data from one exchange is a substitute for data from the other.

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[20] Statement, *supra* note 3, ¶ 16.

[21] The statistics reported are for the same time period (October 2010) and using the same data source (BATS) as relied on by Ordover and Bamberger. *See* Statement, *supra* note 3, ¶ 12, n. 4; at http://www.batstrading.com/market_summary. For the purpose of analyzing competition among exchanges, all exchanges owned by the same corporate parent should be aggregated because they are controlled by the same economic agent, which seeks to maximize the profits of the combined operations. Thus, for purposes of economic analysis, NYSE and NYSE Arca should be considered a single entity. Ordover and Bamberger also report statistics for NYSE and NYSE Arca combined. I have also reported the comparison of trading on NYSE (exclusive of NYSE Arca) to trading on Nasdaq. The relative proportions of trading volume are informative of the relative importance of depth-of-book data from the respective exchanges even though shares of depth-of-book data may differ from shares of trading volume. *See* NYSE Arca Order, supra note 3, at 74784 ("A market participant is likely to be more interested in other exchange and ECN products when the exchange selling its data has a small share of trading volume, because the depth-of-book order data provided by other exchanges and ECNs will be proportionally more important in assessing market depth").

A trader's need for information about a particular security can be satisfied only by data about that particular security. The depth-of-book data on trading in Microsoft are distinct from the depth-of-book data on trading in WalMart. A trader interested in trading Microsoft stock, perhaps because the trader believes that Microsoft will be highly successful in mobile phones, needs data on Microsoft liquidity and therefore needs depth-of-book data from the exchanges that have substantial liquidity in Microsoft stock. Data on liquidity for WalMart, or for that matter most other stocks, from one exchange would not be a significant substitute for data on liquidity for Microsoft on another exchange.

C. Pricing of Depth-of Book Data

Depth-of-book data are sold in monthly subscriptions and are typically based on a fixed monthly fee per device.[22] That fixed subscription fee is independent of the volume of orders generated by the subscriber.[23] The fixed fee is also independent of the extent to which customers use the data. Each monthly subscription provides data on all securities traded on an exchange, and customers are charged the same price whether or not they examine the depth-of-book data for one security, all securities, or some number in between.

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[22] In addition, there may be a cap imposed by the exchange on the total monthly data fees paid by each company for certain types of fees. There may also be per-company fees for access to the datafeeds from the exchange's servers. *See* Filing of Proposed Rule Change Relating to Approval of Market Data Fees for NYSE Arca Data, SEC Release No. 34-53592, 71 Fed. Reg. 33496 at 33496-33497(June 9, 2006).

[23] As I discuss below in Section IV.C, Nasdaq's proposed discount schedule, which would provide for higher discounts on non-professional depth-of-book data fees and trading fees for firms that place orders above certain specified thresholds on Nasdaq, does not result in order-flow competition providing a significant competitive constraint on depth-of-book data fees.

An increase or decrease in the monthly subscription fee for depth-of-book data does not therefore change a trader's marginal cost to purchase or sell a particular security on a particular exchange. That is, in choosing where to place the next trade, an entity would not consider the cost of the subscription fee. Likewise, in setting the depth-of-book monthly subscription fee, the exchange would consider the effect of that fee on the marginal incentive to subscribe to depth-of-book data, but not on the marginal incentive to trade generally or for a particular security.[24]

III. PRICES FOR DEPTH-OF-BOOK DATA FROM ONE EXCHANGE ARE NOT SIGNIFICANTLY CONSTRAINED BY THE AVAILABILITY OF DEPTH-OF-BOOK DATA FROM OTHER EXCHANGES.

According to Ordover and Bamberger, "the existence of alternative sources of information can be expected to constrain the prices platforms charge for market data."[25] Ordover and Bamberger provide no factual support for that assertion, and it is contrary to what happens in the marketplace.

For the reasons discussed above, depth-of-book data from exchanges with substantial liquidity – which obviously includes Nasdaq – are essential information for those traders who buy them. Each is a component of the fixed-cost base of trading data that must be purchased and aggregated.

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[24] My position here and in my prior Reports does not assume that there is no relationship whatsoever between the pricing of depth-of-book data and the volume of order flow. Some traders may decide not to use a trading venue that declines to make depth-of-book data available at all or charges an extremely high price for that data. However, the fixed fees paid for depth-of-book data pricing will not affect the traders' marginal incentives as to where to place their next buy or sell order since the cost of that trade is not affected at all by the decision to use or not use depth-of-book data that the trader has already purchased.

[25] *See* Statement, *supra* note 3, ¶ 67.

To have a reasonably comprehensive view of liquidity below the top of the book, depth-of-book data from all exchanges with substantial depth-of-book liquidity are required. Indeed, for traders to identify the exchange that is the optimal exchange on which to place a large trade, they must purchase and review the depth-of-book data of each center of significant liquidity. Otherwise, they will have a significantly incomplete view of the liquidity for that particular security and might miss the opportunity to execute a trade for that security at a superior price.

Even when other exchanges have some depth-of-book liquidity for a particular security, traders value the liquidity and pricing information available on Nasdaq. Significantly, traders cannot purchase depth-of-book data from Nasdaq just for those securities for which other exchanges have limited liquidity. Nasdaq (and other exchanges) offer their depth-of-book data on an all-or-nothing basis, not by security.

In short, a broker-dealer cannot ignore the depth-of-book data available from a major trading venue, such as Nasdaq. The existence of depth-of-book data from other exchanges does not therefore significantly constrain Nasdaq's pricing of its own depth-of-book data.

IV. COMPETITION FOR ORDER FLOW DOES NOT SIGNIFICANTLY CONSTRAIN DEPTH-OF-BOOK DATA PRICING.

In this section, I address Ordover and Bamberger's conclusion that competition for order flow constrains the pricing of Nasdaq's depth-of-book data. According to Ordover and Bamberger, that is the case because "a trading platform cannot generate market information unless it receives trade orders," suggesting that a

strong and direct relationship exists between order-flow competition and market data prices.[26] "For this reason," Ordover and Bamberger claim, "a platform can be expected to use its market data product as a tool for attracting liquidity and trading to its exchange," thereby constraining market data prices.[27] That assertion is unsupported and wrong.

A. The Relationship Between Order Flow Competition And the Price of Depth-of-Book Data Is Neither Strong Nor Direct.

The premise of Ordover and Bamberger's argument is that order flow and depth-of-book data are directly and inextricably linked because "a trading platform cannot generate market information unless it receives trade orders."[28] That assertion distorts the relationship between the two.

An exchange has at least three sources of revenue relevant to the Proposal: liquidity providers, liquidity takers, and depth-of-book market data purchasers. The provision and taking of liquidity generates order flow and constitutes the trading process. Market data are a byproduct of the trading process.

A strong and direct relationship exists between order flow and prices for liquidity providers and liquidity takers. Liquidity providers are given rebates and other incentives to provide liquidity to the exchanges; those price incentives directly affect the marginal revenue of providing liquidity, and, consequently, the volume of liquidity provided. Liquidity takers are charged for using this liquidity; those fees

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[26] Statement, *supra* note 3, ¶ 67.
[27] Statement, *supra* note 3, ¶ 67.
[28] Statement, *supra* note 3, ¶ 67.

directly affect the marginal cost of taking liquidity and, consequently, the volume of liquidity taken.

Trading venues compete to attract liquidity, which generates trading volume, which in turn generates trading revenues for the platform. Each trade is executed with respect to an individual security, and exchanges charge fees (with separate discounts and rebates for trade-execution services) that are determined on a transactional basis and are designed specifically to affect trading incentives and attract liquidity. Those transaction-based fees for order flow allow traders to assess the costs and benefits of placing a given trade for a given security on a given venue and thus affect traders' marginal incentives to direct order flow among exchanges. Accordingly, the prices that are relevant to attracting order flow (aside from the prices of securities that are purchased or sold) are the transaction fees, including the liquidity rebates, associated with placing orders on a trading venue.[29]

There is not a similar strong or direct relationship between order flow and the price of depth-of-book data. Consider a trader who has purchased monthly subscriptions to the depth-of-book data of the significant exchanges. As I pointed out above, depth-of-book data are sold as monthly subscriptions and are typically based,

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[29] Nasdaq also claims that it "believes that non-professional users that are able to make use of depth data also have a degree of knowledge about market structure that would cause them to favor limit orders, rather than market orders, when buying and selling. Thus, through the proposal, NASDAQ hopes to encourage a 'virtuous circle' in which firms route more liquidity-providing orders to NASDAQ and consume and distribute more data in order to receive the discount, with increased data distribution in turn encouraging still more liquidity provision." *See* Notice of Filing and Immediate Effectiveness of Proposed Rule Change To Link Market Data Fees and Transaction Execution Fees, SEC Release No. 34–63745, 76 Fed. Reg. 4970 at 4971 (January 20, 2011) [hereinafter "Proposed Rule Change"]. The "virtuous circle" claim is not analyzed by Ordover and Bamberger and is otherwise not supported by Nasdaq. I understand that non-professional users do not generally choose which trading venues to direct their limit orders. There will therefore be no direct impact on orders placed on Nasdaq (the claimed "virtuous circle") from decisions made by non-professional users even if the greater consumption of depth-of-book data posited by Nasdaq takes place.

at least in part, on a monthly fee per device and include all securities on the exchange. As a result, the prices that the trader pays for placing an order on an exchange in a particular stock depends only on the prices that the exchange charges for orders and does not depend on the monthly subscription price. Moreover, when the trader made the decision to purchase depth-of-book data for the major exchanges, the trader did not know which exchange that data would later show to be the best trading venue having the best prices and liquidity for that stock. Whether the monthly subscription price is high or low does not affect, in any way, the decision on where to place an order.[30]

Consequently, the availability of depth-of-book data do not directly lead to order flow because that depends mainly on what liquidity has been placed on the several exchanges that traders can consider and because the price of orders is independent of the monthly subscription price. An increase or decrease in the monthly subscription fee for depth-of-book data would not change a trader's marginal cost of buying or selling a particular security on a particular exchange. That is, in choosing where to place the next trade, a trader would not consider the cost of the subscription fee, which has already been incurred and is a fixed amount that does not vary with trading activity. Contrary to Ordover and Bamberger's suggestion, the exchanges do not use depth-of-book data to stimulate trades, as they use rebates and fees for liquidity providers and takers.

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[30] There is a very weak relationship between the monthly subscription price and orders. If an exchange sets the monthly subscription price so high that few traders purchase it, then the number of traders placing orders on that exchange for any stock would likely be reduced. One of the costs of setting the subscription price too high is then the loss of order flow revenue. *See also*, *supra* note 24.

If anything, the fact that market data is a byproduct of order flow suggests that competition for order flow provides an incentive to increase the price of the depth of book data. Lower order flow prices generally will increase order flow, which, in turn, will increase the value of depth-of-book data. That is, by attracting additional order flow, an exchange will not only gain the transaction fees associated with the order flow, but it will also increase the amount it can charge for its depth-of-book data.

Increased depth-of-book revenue can be used to offset the costs of liquidity rebates and discounts that attract order flow. Indeed, the Securities Trading Association observes that "raising the market data fees would enable [the exchanges] to pay higher rebates and thus, attract more order flow."[31] We see that observation empirically verified in the case of consolidated tape data. Trading venues use revenue from consolidated tape data to compete for order flow. As Nasdaq states: "Participants in the UTP [consolidated tape] Plan have used tape fee revenues to establish payment for order flow arrangements with their members and customers."[32]

The profit-maximizing strategy for exchanges, absent any regulatory requirements, would be to set lower prices for order flow, which would have the effect of increasing the value of, and the prices the exchanges can charge for, their depth-of-book data.

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[31] STA Comment Letter, *supra* note 19, at 3.

[32] Nasdaq Stock Market, Inc., Annual Report (Form 10-K), at 17 (Feb. 25, 2008).

B. Ordover and Bamberger's Conclusion That Order-Flow Competition Significantly Constrains Depth-of-Book Data Pricing Is Wrong.

Based on the premise that market data would not exist without order flow, Ordover and Bamberger jump to the conclusion that competition for order flow is a significant competitive constraint because "a platform can be expected to use its market data as a tool for attracting liquidity and trading to its exchange."[33] That is wrong.

Although an exchange has an incentive to make available its depth-of-book data, and not to set such an exorbitant price that few potential buyers of the data would be willing to pay (effectively making it unavailable), the exchange nevertheless can charge prices above competitive levels for those data if the exchange is not constrained by significant competitive forces in their sale and such data have value to customers by reflecting substantial liquidity. Once a seller makes a product available, the price that the seller can charge for the product is a function of whether consumers value the product and whether economically significant substitutes are available.

Furthermore, one would not expect pricing for market data to be constrained by competition for order flow. Order-flow competition implies that traders can and do switch easily among many alternative trading venues. That simply underscores the need for traders to purchase depth-of-book data from all venues with significant liquidity, as they will not know at the time of the data-purchase decision where

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[33] Statement, *supra* note 3, ¶ 67.

liquidity may shift and cannot take the risk that they will miss a significant source of liquidity at favorable volumes and prices.

Consider a small increase in the price of each product. A five percent increase in the monthly subscription fee for depth-of-book data would not have any material effect on the demand for order flow for two reasons. As noted above, the increase in the price of depth-of book data would have no effect on the price of, and therefore the marginal demand for, transactions.

On the other hand, a five percent increase in the price of transactions might well have a material effect on order flow and also on the demand for depth-of-book data. Increasing the price of transactions would reduce the number of orders and would thereby reduce the amount of, and value of, depth-of-book data. In such a case, the willingness of customers to pay for depth-of-book data would decline, especially if those data reflected a significant reduction in liquidity.

An exchange with substantial liquidity therefore maintains significant leverage over the consumers of its depth-of-book data. That dynamic – significant leverage over market data customers and little or no leverage over providers and takers of liquidity – can result in high prices for market data through the exercise of significant market power over unique liquidity data, and low prices for order flow that reflect intense competition and the ability to use revenues from depth-of-book data to subsidize execution costs.

C. The Evidence On Which Ordover And Bamberger Rely Does Not Support Their Conclusion That Nasdaq's "Platform" Proposal Is Constrained By Competitive Forces.

As discussed above, the fees paid for depth-of-book data do not generally vary with the volume of orders placed on an exchange. This is one reason why

competition for order flow does not act as a significant competitive constraint on depth-of-book data prices. Indeed, the only instance of which I am aware where there is a relationship between a firm's use of an exchange for trading and the fees paid for depth-of-book data from that exchange is the current Nasdaq proposal.

As an initial matter, the discount reflected in the Nasdaq market data fees in question here applies only to data fees for non-professional users, so it has no impact on data fees for professional users. Even for fees for non-professional users, a consideration of the economic incentives resulting from the proposed rate schedule demonstrates that it does not provide for a significant competitive constraint of order flow competition on depth-of-book data prices.

Nasdaq's proposal provides for increasingly higher discounts on non-professional depth-of-book data fees and trading fees for firms that place orders above certain specified thresholds on Nasdaq.[34] In particular, for non-professional depth-of-book data fees, under Nasdaq's proposal, greater use of Nasdaq for trading provides for higher discounts on Nasdaq's depth-of-book data fees for non-professional users. While Nasdaq's proposal is on its face a discount on the price of depth-of-book data for non-professional users, in terms of Nasdaq's incentives to attract order flow, the proposed discount scheme would provide an incentive to raise the undiscounted price of Nasdaq's depth-of-book data.[35] A higher depth-of-book

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[34] *See* Proposed Rule Change, *supra* note 29, at 4971.

[35] The Proposal would provide a discount on the current price of Nasdaq's depth-of-book data for non-professional users for those firms that qualified for the applicable discount tiers. If the view expressed by Nasdaq and Ordover and Bamberger that Nasdaq should be free to set its depth-of-book data fees at any level it wishes were accepted, Nasdaq would be able to raise the non-discounted price of its depth-of-book data in the future.

data price means a larger discount for placing more orders on Nasdaq. Higher, rather than lower, undiscounted depth-of-book data prices will provide a greater incentive to place orders on Nasdaq (in terms of the effect of this proposed discount scheme).

This does not therefore mean that the net price of Nasdaq's depth-of-book data for non-professional users would be significantly constrained by the competition for order flow. Nasdaq is simply offering a discount on market data in exchange for the placement of order flow. Nor have Ordover and Bamberger provided any evidence or analysis that competition for order flow would act as a significant competitive constraint on the price of depth-of-book data as a result of the proposed discount scheme.

Ordover and Bamberger also cite Nasdaq's introduction of a cap on the "non-displayed use" of certain Nasdaq depth-of-book data (for use on personal computers and servers for analysis and processing of trading, where the data are not displayed to a user), which they claim was in response to Nasdaq's concern that a member would move order flow from Nasdaq to a competing platform, as evidence of the constraining effect of platform competition on the price of depth-of-book data.[36] As discussed by Ordover and Bamberger, the focus of competition among exchanges in recent years has been for the sale of transaction services rather than competition in the sale of depth-of-book data. Ordover and Bamberger's examples of pricing competition among exchanges are almost exclusively on the prices of transaction

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[36] Statement, *supra* note 3, ¶ 29.

services rather than of depth-of-book data.[37] The only example offered of competition among exchanges in the use of depth-of-book data pricing to compete for order flow is the cap for non-displayed use.

My understanding is that this example does not illustrate competition among exchanges in the pricing of depth-of book data. Rather, in the past, Nasdaq had not attempted to charge for the non-displayed use of depth-of-book data, but had recently become concerned about the possible shift from displayed to non-displayed use of depth-of-book data, such as through an increased use of algorithmic trading rather than human traders. Instead of illustrating an attempt to compete on depth-of-book data prices, this example illustrates an attempt to restructure its depth-of-book data fees and, possibly, to increase prices to broker-dealers.[38]

V. PRICES FOR DEPTH-OF-BOOK DATA ARE NOT SIGNIFICANTLY CONSTRAINED BY INTER-PLATFORM COMPETITION.

Ordover and Bamberger argue that inter-platform competition acts as a significant competitive constraint on the pricing of depth-of-book data. Ordover and Bamberger focus on the "total return" or "aggregate return" that a platform receives from trade execution services and depth-of-book and other market data.[39] They

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[37] Statement, *supra* note 3, ¶¶ 23-25. Ordover and Bamberger make reference to what they claim is competition with Nasdaq in the pricing of its "Last Sale" data used for display on web sites. The Last Sale data report the last sale price of different securities and are not depth-of-book data. Even if Ordover and Bamberger's claim were correct with respect to Last Sale data, it would not indicate that there is competition for the pricing of Nasdaq's depth-of-book data. There is no reason to expect that the competitive conditions for Last Sale data displayed for informational purposes on public web sites would be indicative of those for depth-of-book data used by traders for evaluating and placing large orders.

[38] As I have noted in my prior reports, the fact that exchanges with significant depth-of-book liquidity do not face significant competitive constraints on pricing of depth-of-book data does not mean that they can increase prices indefinitely without facing customer resistance. *See* Evans Second NYSE Arca Report, *supra* note 12, at 14-15.

[39] Statement, *supra* note 3, ¶¶ 5, 19, 28.

claim that the "total price of trading" on a platform – including the price of execution and the price of data – is constrained by the total price of trading on alternative platforms.[40] Based on that hypothesis, Ordover and Bamberger contend that Nasdaq should be free to set depth-of-book data prices at whatever high price it chooses because "an 'excessive' price" for market data would result "in lower prices for other products sold by the firm."[41]

Ordover and Bamberger's claim is therefore not that the price of *depth-of-book data* will be constrained by platform competition, but rather, that an elevated price for depth-of-book data will be offset by a lower price for trade execution. Even if that were true, it is irrelevant to the statutory standard for exchange fees. The relevant standard suggested by the SEC is whether the *price of depth-of-book data* is significantly constrained by competitive forces, not whether an elevated data price for all customers is offset by lower trade execution prices (for some customers). Indeed, in the *NetCoalition* decision, the D.C. Circuit identified "the costs of collecting and distributing market data" as the relevant costs to consider in the competitive analysis, not the total costs of the trading venue or whether there were countervailing effects on the price of trading services.[42] The allocation of the total costs of the trading venue simply does not address the fundamental proposition of whether competition for trading services constrains the price of market data.

Ordover and Bamberger's economic argument is also fundamentally flawed. Even if one assumes that depth-of-book data prices are a component of the "total

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[40] Statement, *supra* note 3, ¶ 38.
[41] Statement, *supra* note 3, ¶ 21.
[42] *NetCoalition*, 615 F.3d at 537.

price of trading," that component does not affect the marginal incentives of a broker-dealer to execute a trade, as discussed in the previous section. On the other hand, transaction fees can and do affect order flow decisions and thus the generation of valuable depth-of-book data. Thus, while inter-platform competition for trading may constrain the prices of trade execution services, it does not significantly constrain depth-of-book data fees. As noted above, that inter-platform competition could result in high depth-of-book data fees cross-subsidizing low trade execution fees.

Ordover and Bamberger further attempt to advance their "total return" argument by characterizing trade execution services and market data as "joint products" with "joint costs" and by asserting that trading platform competition will necessarily constrain the total return from those joint products.[43] Where two "joint products" of the same facility are sold as separate products and in separate proportions, if there is market power in one of the products, the price of that product will not be competitively constrained by "platform competition."

A classic example of joint products with joint costs is the production of wool and mutton, to which Ordover and Bamberger and Nasdaq refer numerous times. Wool and mutton are joint products of a sheep, and many of the costs of producing both products (*i.e.*, the care, feeding, and handling of the sheep) are the same. However, the demand conditions for wool are independent of those for mutton. There is no relationship between the final demand for wearing sweaters and that for eating lamb chops.

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[43] Statement, *supra* note 3, ¶ 5 ("Competition among trading platforms can be expected to constrain the aggregate return each platform earns from its sale of the array of its products, including the joint products at issue here, which are execution services and proprietary data. . . .").

Suppose, for example, that market conditions are such that only one firm can produce desirable wool (because its sheep have much better wool than its competitors' sheep), while many firms can produce desirable mutton (if we assume the mutton from all sheep is perfectly substitutable). Under those conditions, the competition to produce mutton, however intense it might be, will not significantly constrain the monopoly wool producer's pricing of wool. If other firms cannot produce wool of satisfactory quality, the monopoly wool producer will face no competition in the pricing of wool, even as the pricing of mutton faces intense competition. Our point here is that the existence of joint costs for joint products does not ensure a particular competitive outcome in either product market.

Ordover and Bamberger appear to agree with this elementary point, but argue that "competitive concerns" are "not present here because, as we have seen, other exchanges have been able to enter, flourish, and divert business from NASDAQ."[44] But Ordover and Bamberger do not provide any basis for their assertion that there is no reason for concern over Nasdaq's *depth-of-book data* pricing because other platforms are able to compete for *order flow*. And, in fact, intense competition among trading platforms could result in all of them choosing to adopt high prices for depth-of-book data and low prices for transaction services. That would not be consistent with the objectives of the Exchange Act.

Moreover, as Ordover and Bamberger acknowledge, "all else equal, the deeper is the 'depth-of-book' information on an exchange, the more valuable it is."[45]

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[44] Statement, *supra* note 3 ¶ 41.
[45] Statement, *supra* note 3, ¶ 16.

As I discussed in Section II above, there are significant differences in the volume of trading across exchanges and the value of the depth-of-book data on different exchanges. Such an outcome is compatible with significant competition for order flow among exchanges.

Indeed, when new trading platforms such as BATS and Direct Edge entered, they started with no trading volume and no market data of value. This substantial disadvantage with respect to depth-of-book data relative to NYSE and Nasdaq did not prevent BATS and Direct Edge from competing for order flow. That is, there is no basis for Ordover and Bamberger's claim that market power in depth-of-book data would necessarily be reflected in significantly diminished competition for order flow.

As I have explained, in the case of trading venues, competition for order flow does not significantly constrain depth-of-book data pricing even if they are viewed as joint products. Regardless of competitive conditions for trade execution, an exchange can charge supracompetitive prices for depth-of-book data if the exchange does not face significant competitive constraints in the sale of such data and such data have value by reflecting substantial liquidity. As demonstrated in Sections III and IV above, that is the case here.[46]

Finally, even if Ordover and Bamberger's "total products" theory were correct, consumers that purchase little or no trade execution services from Nasdaq would pay elevated prices for depth-of-book data with little or no offset from lower

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[46] *See also* Evans First NYSE Arca Report, supra note 12.

trade execution prices. The prices paid by those customers would not be constrained by significant competitive forces.

VI. CONCLUSION

The fundamental problem with Ordover and Bamberger's argument is that it is simply not relevant to the matter before the SEC. Their basic argument is that competition between exchanges results in the elimination of profit and makes their ***total*** prices track their ***total*** costs. If exchanges charge high prices for depth-of-book data, they would charge low prices for order flow or something else. Whether that is true or not—and Ordover and Bamberger provide no evidence that it is—it is irrelevant to the question before the SEC. An outcome in which "platform" competition results in high-priced data that is used to subsidize order flow does not show that those data prices are fair and reasonable.

Nothing about sheep, mutton and wool salvages the flaw in this argument. The sheep market happens to be intensely competitive in mutton and wool. But that does not mean that all businesses based on joint products are competitive in both. As noted above, if only a handful of farmers had good wool for sweaters, those farmers could have market power in wool even though they were selling mutton on a competitive market.

The fact is that exchanges, which are the subject of this proceeding, are quite different from sheep. Only Nasdaq can supply the depth-of-book data that traders need for assessing whether they should trade on Nasdaq and elsewhere. Nasdaq has incentives to charge high prices for those data and in fact to use the revenue from that data to subsidize order flow. Nasdaq's depth-of-book data prices are not constrained by competitive forces and nothing that Ordover and Bamberger say changes that fact.

EXHIBIT A

AN ECONOMIC ASSESSMENT OF WHETHER "SIGNIFICANT COMPETITIVE FORCES" CONSTRAIN AN EXCHANGE'S PRICING OF ITS DEPTH-OF-BOOK MARKET DATA

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I. INTRODUCTION[1]

NYSE Arca, Inc. (Exchange) requested that the Securities and Exchange Commission (SEC) approve a proposed rule change (the "Proposal") that would allow the Exchange to establish certain fees for depth-of-book market data (also known as unconsolidated, or non-core, data).[2] The SEC has issued a Notice that presents a Proposed Order to approve that request and the SEC's basis for doing so.[3]

In the Proposed Order, the SEC describes what it calls a "market-based" approach to its oversight of depth-of-book data pricing and other terms.[4] The SEC bases its analysis on whether the exchange is subject to "significant competitive forces"[5] in setting the terms, including any applicable fees, of its proposal for unconsolidated data. If it believes the answer is yes, then the SEC will approve the proposal unless it determines 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."[6] If it believes that the answer is no, then the SEC will require the exchange to provide "a substantial basis, other than competitive forces, in its proposed rule change demonstrating that the terms of the proposal are equitable, fair, reasonable, and not unreasonably discriminatory."[7]

Based on this framework, the SEC presents its preliminary findings with respect to the Exchange's Proposal. The SEC concludes that "[a]t least two broad types of significant competitive forces applied to NYSE Arca in setting the terms of

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[1] This Report was prepared at the request of NetCoalition.

[2] Filing of Proposed Rule Change Relating to Approval of Market Data Fees for NYSE Arca Data, SEC Release No. 34-53952, 71 FR 33496 (June 9, 2006). As I discuss below, for the purpose of analyzing competition among exchanges, all exchanges owned by the same corporate parent should be aggregated because they are controlled by the same economic agent, which seeks to maximize the profits of the combined operations. Thus, for purposes of economic analysis, NYSE Arca and NYSE should be considered a single entity, NYSE Group.

[3] Proposed Order Approving Proposal by NYSEArca, Inc. to Establish Fees for Certain Market Data and Request for Comment, SEC Release No. 34-57917, 73 Fed. Reg. 32751 (June 4, 2008) [hereinafter "Proposed Order"].

[4] *Id.* at 32761.

[5] *Id.* at 32762. For the purposes of this Report, I am assuming as correct the standard that is specified in the Proposed Order—that proposed terms for the sale of depth-of-book data are "equitable, fair, reasonable, and not unreasonably discriminatory" if those terms are subject to "significant competitive forces." In particular, I am not addressing whether depth-of-book data necessarily constitute a relevant antitrust market but am addressing only whether "significant competitive forces" would necessarily constrain the setting of depth-of-book fees by the exchanges and thereby prevent the exercise of market power over those fees.

[6] *Id.*

[7] *Id.*

its Proposal."[8] One source of competitive constraint claimed by the SEC is the availability of alternatives to an exchange's depth-of-book data. The other source is competition for order flow among trading venues, including exchanges, electronic communication networks (ECNs) and alternative trading systems (ATSs).

This Report examines whether the SEC's conclusion is sound as a matter of economics and whether it is supported by the evidence the SEC presents. I have been asked to assume that the SEC is correct that competition exists for order flow and to address the question of whether that assumed competition would preclude an exchange from exercising significant market power over the pricing of depth-of-book market data.[9]

I find that the SEC's preliminary conclusion regarding the existence of significant competitive constraints on the Exchange's pricing of depth-of-book data is not supported by the analysis and evidence that the SEC presents. On the contrary, the economics and evidence indicate that:

- the Exchange likely has significant market power over the pricing of its depth-of-book market data;
- the availability of the alternative sources of depth-of-book data that the SEC identifies would not constrain that market power; and
- competition for order flow would not constrain that market power.

The remainder of this Report is organized as follows. Section II explains the flaws in the SEC's conclusion that economically significant alternatives to an exchange's depth-of-book data exist and that such alternatives constrain the exchange's pricing of its depth-of-book data. Section III explains the flaws in both

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[8] *Id.* at 32763.

[9] Market power refers to the ability to charge a price that exceeds the price that would be charged under competitive conditions. *See* DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 642 (4th ed. 2005). Since most firms have some limited market power, economists typically focus on significant market power. Under the *Horizontal Merger Guidelines*, the ability to raise price above the competitive level by 5-10 percent for a sustained period of time is considered significant market power. *See* U.S. DEP'T. OF JUSTICE AND THE FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES (1992, Revised 1997).

the SEC's premise and conclusion that competition for order flow constrains the pricing of depth-of-book data. Section IV concludes.

II. THE ALTERNATIVES IDENTIFIED BY THE SEC DO NOT SIGNIFICANTLY CONSTRAIN THE PRICING OF AN EXCHANGE'S DEPTH-OF-BOOK DATA AND ARE NOT SUBSTITUTES.

The SEC concludes that alternative sources of information "impose significant competitive pressures on an exchange in setting fees for its depth-of-book order data."[10] It identifies four categories of data that are supposedly alternatives that constrain an exchange in pricing its depth-of-book data:

1. depth-of-book data from other trading venues;
2. the exchange's own consolidated data;
3. "pinging" the various markets by routing oversized marketable limit orders; and
4. the threat of independent distribution of depth-of-book data by securities firms and data vendors.[11]

A. The SEC Does Not Adequately Support Its Claims of Alternative Products.

The SEC does not present any evidence to support its claim that the four alternatives that it identifies are in fact economic substitutes for depth-of-book data that would constrain an exchange's pricing of that data. Ordinarily, an analysis of whether two products are substitutes for each other would consider whether consumers would readily switch between products in response to changes in relative prices. The SEC provides no evidence that any of the alternative sources of data it mentions are treated as substitutes by market participants, allow market participants

[10] Proposed Order, *supra* note 3, at 32766.
[11] *Id.* at 32765.

to achieve the same objective, or have similar costs. The SEC simply lists alternatives and asserts that they are substitutes. That is not enough.

Common and well-accepted methods are used to determine whether products are sufficiently close substitutes such that an increase in the price of one product would lead consumers to substitute another product and thereby make that price increase unprofitable. A basic inquiry is whether products serve the same purpose from the standpoint of the customer. If a consumer were considering the substitutes for a BMW, she probably would not consider a bicycle as a substitute because, for virtually all uses, a BMW and a bicycle do not serve the same purposes in a reasonably interchangeable way. Even within the category of automobiles, low-end automobiles such as Kias may not be substitutes for high-end cars such as BMWs because potential buyers of BMWs would not usually consider a Kia as a reasonably substitutable alternative to a BMW.

As an alternative to the principle of reasonable interchangeability, the SSNIP (small but significant non-transitory increase in price) test is commonly used by the U.S. Department of Justice, the Federal Trade Commission, the European Commission, and many other competition authorities to identify which products are sufficiently close substitutes so as to constrain the exercise of market power.[12] The SSNIP test poses the hypothetical question of whether a producer could profitably increase the price of a product or group of products by 5-10 percent above the competitive level. If it is possible, then that product or group of products constitutes a market and products outside that market are not sufficiently strong substitutes to defeat an attempted price increase. If it is not possible, then other products must provide good enough substitutes and should be included in the market as competitive forces that constrain the exercise of market power.

The SEC neither purports to define a relevant market nor presents any evidence that demonstrates that its proffered alternatives to an exchange's depth-of-book data are reasonably interchangeable with such data or would constrain the

[12] EINER ELHAUGE & DAMIEN GERADIN, GLOBAL COMPETITION LAW AND ECONOMICS 287-288 (2007).

pricing of such data under the SSNIP (or any other) test. As I discuss next, none of those alternatives is likely a significant constraint on the exchanges' pricing of depth-of-book data.

B. The Alternative Sources of Depth-of-Book Data Identified by the SEC Are Likely Not Substitutes for an Exchange's Depth-of-Book Data.

The purpose of assessing whether substitutes exist for NYSE Arca (or any other exchange's) depth-of-book data is to identify products that will act as competitive constraints if the Exchange attempts to exercise market power in its pricing of depth-of-book data. The relevant substitutes must therefore come from independent competitors that set prices independently of the Exchange. If another potential source of depth-of-book data is controlled by the same corporate entity, that product does not provide an effective competitive constraint—the corporate entity's profit-maximizing incentive is to coordinate the pricing of both products, not to use one to compete with the other.[13]

For the purposes of analyzing market power over depth-of-book data, the combined share of NYSE and NYSE Arca is relevant, not their respective individual shares. The pricing of depth-of-book data for both NYSE and NYSE Arca are controlled by the same corporate entity, NYSE Group. To the extent that, hypothetically, a price increase in NYSE Arca's depth-of-book data results in shifts to purchases of NYSE's depth-of-book data, those are revenues that are retained by the same corporate entity.

The SEC observes that NYSE and NYSE Arca "operate as separate trading centers with separate limit order books, and each distributes its depth-of-book order data separately for separate fees."[14] That is beside the point. Even if NYSE and

[13] For that reason, related corporate entities are treated as a single economic actor for antitrust purposes. *Cf. Copperweld Corp. v. Independence Tube Corp.*, 467 U.S. 752, 769-72 (1984). In *Copperweld*, the Supreme Court rightly observed that, where entities are not "separate economic actors pursuing separate economic interests," they should be considered "a single actor" on the marketplace. *Id.* at 769-70. The Court further stated that "there can be little doubt that the operations of a corporate enterprise organized into divisions must be judged as the conduct of a single actor. . . . A division within a corporate structure pursues the common interests of the whole, rather than interests separate from those of the corporation itself." *Id.* at 770.

[14] Proposed Order, *supra* note 3, at 32763, n.184.

NYSE Arca are operated as separate exchanges, the same corporate entity controls and profits from both exchanges and will coordinate the pricing of the two. Aggregating the shares of distinct products sold by the same firm is the routine practice in merger review and in the antitrust case law.

I now consider the four data sources that the SEC claims are alternatives that significantly constrain the pricing of an exchange's depth-of-book data.

1. Depth-of-book data from other trading venues

The SEC first asserts that depth-of-book data from other trading venues constrain the Exchange's pricing of its own depth-of-book data. At the outset, we note that each exchange's depth-of-book data are unique to that exchange. Depth-of-book data from NYSE, for example, reflect different orders from depth-of-book data from Nasdaq or BATS or Direct Edge. To have a reasonably comprehensive picture of liquidity below the top of the book, depth-of-book data from all exchanges with substantial trading are required. That proposition underlies the rules and regulations that have led to the consolidated tape—*i.e.*, the requirement that all trading venues contribute their data so that the national-best-bid-and-offer and the last-transaction data can be compiled and displayed to the investment community.

In addition, depth-of-book data from different trading venues reflect liquidity of substantially different magnitudes and quality. Nasdaq and NYSE Group, for example, operate by far the leading exchanges for trading in U.S.-listed equities. Based on the statistics reported by the SEC for December 2007, NYSE accounts for 22.6 percent of all trading volume and NYSE Arca accounts for 15.4 percent. Thus, the NYSE Group accounts for 38.0 percent of all trading volume.[15] Nasdaq accounts for 29.1 percent of all trading volume.[16] NYSE Group and Nasdaq control the only

[15] *Id.* at 32763 (Table 1). NYSE is in the process of acquiring the American Stock Exchange, which accounts for a further 0.8 percent. Press Release, NYSE Euronext, NYSE Euronext to Acquire the American Stock Exchange (Jan. 18, 2008), *available at* http://www.nyse.com/press/1200568235016.html.

[16] *Id.* at 32763 (Table 1). Nasdaq has also announced the pending acquisition of the Philadelphia Stock Exchange, which accounts for a further 0.1 percent. *See* Press Release, NASDAQ, NASDAQ to Acquire Philadelphia Stock Exchange (Nov. 7, 2007), *available at* http://www.nasdaq.com/newsroom/news/newsroomnewsStory.aspx?textpath=pr2007\ACQPMZ200711070730PRIMZONEFULLFEED130788.htm&year=11/07/2007%20+7%3a30AM.

trading venues of any significant size. While there are smaller trading venues—primarily BATS and Direct Edge—they account for substantially less trading volume.

In analyzing market power over depth-of-book data, it is important to recognize that the depth-of-book data for a given stock are unique. The depth-of-book data on trading in AT&T are distinct from the depth-of-book data on trading in Google. A trader interested in trading AT&T stock needs data on AT&T trading—if one exchange has a significant share of trading in AT&T, data from another exchange that has a significant share of trading in Google is not directly pertinent to the AT&T investment decision.

The dominance of NYSE Group and Nasdaq in pertinent liquidity is even more apparent when we consider separately trading in NYSE-listed and Nasdaq-listed stocks. For trading in NYSE-listed stocks in December 2007, NYSE Group exchanges had a 53.6 percent share and Nasdaq had a 18.4 share.[17] By contrast, the SEC reported shares for BATS of 5.1 percent and for Direct Edge of 3.0 percent for trading in NYSE-listed stocks.[18] For trading in Nasdaq-listed stocks in December 2007, Nasdaq had a 45.4 percent share and NYSE Group had a 14.8 percent share.[19] By contrast, the SEC reported shares for BATS of 7.9 percent and for Direct Edge of 6.9 percent.[20]

A broker-dealer interested in depth-of-book data is unlikely to ignore the depth-of-book data available from the leading trading venues. The value of the depth-of-book data from trading venues that have a significant share of trading volume in a significant group of securities is higher than the value of depth-of-book data from a trading venue that does not have such a share.

The availability of data from other trading venues therefore does not effectively constrain the prices that significant venues can charge. This finding is

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[17] I have used the same source and time period for these shares as reported by the SEC. *See* ArcaVision, *available at* http://www.arcavision.com. NYSE had a share of 41.2% while NYSE Arca had a share of 12.4%.
[18] Proposed Order, *supra* note 3, at 32763.
[19] *See* ArcaVision, *available at* http://www.arcavision.com. NYSE does not offer trading of Nasdaq-listed stocks.
[20] Proposed Order, *supra* note 3, at 32763.

confirmed by the asymmetry that the SEC acknowledges in the pricing of depth-of-book data by different trading venues.[21] Venues without significant liquidity in a substantial number of securities may have difficulty charging significant (or any) prices for their market data and may have difficulty getting their market data distributed (in the absence of regulatory requirements) while venues with significant liquidity—NYSE Group and Nasdaq—can and do charge significant prices for their data as I discuss further below.

2. Consolidated data

The SEC's second claimed alternative is consolidated data. The consolidated data consist of the national best bid and offer for a stock and the last sale for a stock reported in any market.[22] Depth-of-book data, however, reflect liquidity *below the top-of-book* that is different from, and in addition to, the liquidity reflected by consolidated data. As NYSE Arca explains:

> Now more than ever, in order to see and estimate true market liquidity, you need to look beyond just the top of book price. When comparing all available liquidity at the inside to ArcaBook, you'll see that within five cents of the NBBO, ArcaBook data may provide six times more liquidity than is offered by all market centers' top of book at the market inside.[23]

The customers that purchase depth-of-book data are those that need the significant additional information on liquidity provided by depth-of-book data.[24] No rational purchaser would pay significant fees in excess of the fees that he or she pays for consolidated data to acquire depth-of-book data if the two were good substitutes.

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[21] *Id.* at 32769; *see also* Section III for a discussion of this issue.

[22] *Id.* at 32770.

[23] *See* ArcaBook: Speed, Depth and Value at a Competitive Price, *available at* http://www.nyxdata.com/nysedata/DesktopModules/Bring2mind/DMX/Download.aspx?PortalId=0&EntryId=6095.

[24] The SEC also states that "only 19,000 professional users purchase Nasdaq's depth-of-book data product and 420,000 professional users purchase core data in Nasdaq-listed stocks." (As I discuss below, *see infra* note 41, this figure may understate the number of professional users of all of Nasdaq's depth-of-book data products.) The SEC believes that this strongly suggests that no exchange has monopoly pricing power for its depth-of-book data because the substantial majority of professional users either do not believe they need the data or that the cost exceeds the value they place on the data. That is the wrong conclusion to draw. Monopolists commonly set prices to restrict output—the fact that a monopolist is selling only to a subset of potential customers is consistent with its having set prices above competitive levels so that only those that value its product highly will purchase the product.

If the price of depth-of-book data were increased, the consumers of those data would not increase their purchases of consolidated data since they already consume those data and the data do not reflect additional liquidity. Likewise, if the price of depth-of-book data were decreased, the consumers of those data would not likely purchase less consolidated data. Thus, consolidated and depth-of-book data are not economic substitutes and the former cannot constrain the pricing of the latter.

3. "Pinging"

"Pinging" orders are "oversized marketable limit orders [designed] to access an exchange's total liquidity available at an order's limit price or better."[25] Pinging orders are used to expose liquidity that is hidden in reserve orders on an exchange. A pinging order will execute against any hidden liquidity, and thus reveal depth information that is not available from the exchange's depth-of-book data. Pinging orders find liquidity that is not displayed. They do not gather information on depth-of-book data that are available for purchase.

The SEC asserts that the use of pinging may be expanded into a viable substitute for an exchange's depth-of-book data. The SEC appears to argue that, because pinging orders extract data that are not available from the exchange's depth-of-book data, and is superior in *that* respect, pinging can also serve as a substitute to the depth-of-book data. But the SEC has provided no evidence that pinging provides a viable alternative that would significantly constrain the pricing of depth-of-book data by the exchanges.

In fact, pinging does not appear capable of replicating an exchange's depth-of-book data. First, pinging places limit orders that incur the risk of execution to gather the data. If the execution is not optimal, the trade can involve a cost greater than the market data.

Second, the information on liquidity returned from a pinging order is substantially different from the information provided by an exchange's depth-of-

[25] Proposed Order, *supra* note 3, at 32765.

book data. When a pinging order is executed, the execution reveals only that the number of shares specified in the order were available at the specified price. The executed order does not indicate whether more liquidity at that price was available or whether any liquidity beyond that price remains available.

Alternatively, when a pinging order is not executed, one knows only that the specifically requested liquidity at that price is not available. But that information does not indicate if a lesser amount of liquidity at or beyond that price is available.

Pinging is thus an inferior substitute, if a substitute at all, for depth-of-book data. Despite the SEC's suggestion, an increase in the price of depth-of-book data would not plausibly result in a significant increase in pinging, and a decrease in the price of depth-of-book data would not plausibly result in a significant decrease in pinging. The SEC has not presented any evidence to the contrary.

4. Collaboration

The SEC's claim that the threat of potential entry by a collaborative venture of securities firms currently imposes a significant competitive constraint on the Exchange's pricing of its depth-of-book data is speculative, implausible, and unsubstantiated.

The U.S. Department of Justice and the Federal Trade Commission's *Horizontal Merger Guidelines* require entry to be "timely, likely, and sufficient in its magnitude, character and scope to deter or counteract" attempts to exercise market power.[26] To be timely, entry needs to take place within two years.[27] To be likely, entry needs to be profitable at competitive prices.[28] And to be sufficient, entry needs to deter or counteract the exercise of market power.[29]

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[26] U.S. DEP'T. OF JUSTICE AND THE FED. TRADE COMM'N., HORIZONTAL MERGER GUIDELINES § 3.0 (1992, Revised 1997).
[27] *Id.* § 3.2.
[28] *Id.* § 3.3. Specifically, the *Horizontal Merger Guidelines* use profitability at pre-merger prices as the relevant standard.
[29] *Id.* § 3.4.

The SEC has provided no evidence that the threat of entry by a collaborative effort is timely, likely or sufficient so as to impose a current competitive constraint on the Exchange's pricing of depth-of-book data. In fact, securities firms almost certainly could not successfully collaborate in a timely and sufficient manner so as to impose a significant constraint on the ability of the Exchange to exercise market power over its depth-of-book data.

Consider the hurdles and expense that the securities firms would face to provide complete depth-of-book data through collaboration. To provide such depth-of-book data, hundreds of securities firms would have to come together, agree to join a collaborative effort, and provide the depth-of-book data on a timely basis. To form a collaborative enterprise, one or more securities firms would have to act as entrepreneurs to organize their direct competitors, enlist still other securities firms in the venture, establish governance and voting structures, and form an on-going joint venture that compiles and distributes comprehensive data on a timely basis. The organizational costs of doing so are likely prohibitive.

The competing firms, which are diverse, would also have to agree how to split the costs and revenues associated with supplying the depth-of-book data. The process of securing such an agreement on acceptable business terms would likely be time-consuming, challenging, and costly. Forming successful joint ventures of two firms is ordinarily difficult; forming one among hundreds of competitors would be more difficult by far. For example, the venture may fail if only one significant securities firm refuses to participate or if large securities firms, recognizing this, refuse to participate in the absence of receiving a disproportionate share of the net benefits. In addition, the joint venture would have to address the numerous regulatory issues associated with collaborations among direct competitors.[30]

Even if the large competitor collaboration could be formed, its product may be of a quality that is inferior to that of the exchanges. To serve as an economically relevant substitute for depth-of-book products, the hypothetical collaboration's

[30] *See, e.g.*, U.S. DEP'T. OF JUSTICE AND THE FED. TRADE COMM'N, *Antitrust Guidelines for Collaborations Among Competitors* (April 2000).

depth-of-book data must be substantially comprehensive across exchanges, which in turn would require virtually industry-wide participation. In the likely event that the hypothetical collaboration's depth-of-book product is not substantially comprehensive, its incomplete information on available liquidity may well not serve as a viable substitute for an exchange's complete offering.

Moreover, the exchange would have to believe that the collaborative effort could provide the depth-of-book data at such a price that the exchange would not be able to exercise market power. The collaborative venture, however, would face a significant cost disadvantage relative to the exchanges. The exchanges obtain the depth-of-book data for free as a byproduct of their being SROs. The collaborative venture would collect the depth-of-book data at a higher cost and less efficiently than the exchanges. The collaborative venture would therefore confront a higher cost structure with greater logistical challenges than those of an exchange and, as a result, would not likely impose a significant constraint on the Exchange's pricing of depth-of-book data.

5. Summary on the availability of substitutes

Competition authorities and courts consider the availability of only close substitutes—ones that consumers would, in fact, turn to in the face of a price increase—as constraints on the exercise of significant market power. The SEC's analysis ignores that established framework and asserts, with no economic or factual basis, that several alternatives are substitutes for the depth-of-book data. The SEC seems to further assume that any degree of substitution (*e.g.*, bicycles for cars as modes of transportation) can constrain market power without any consideration of whether the products at issue are reasonably interchangeable for the relevant end use or whether one can defeat a price increase of the other.

III. COMPETITION FOR ORDER FLOW DOES NOT SIGNIFICANTLY CONSTRAIN THE EXCHANGE'S DEPTH-OF-BOOK DATA PRICING.

In this section, I consider whether competition for order flow significantly constrains the pricing of an exchange's depth-of-book data, the other supposed competitive constraint that the SEC has identified in the Proposed Order. The SEC has claimed that competition for order flow and the pricing of depth-of-book data are "two sides of the same coin" and, therefore, competition for order flow is a significant constraint on any market power the exchanges possess over depth-of-book data. Both the SEC's premise and its conclusion are wrong.

A. The SEC's Premise that Order Flow and Depth-of-Book Data Are "Two Sides of the Same Coin" Is Wrong.

The lynchpin of the SEC's argument is that order flow competition and depth-of-book data are "two sides of the same coin" insofar as a strong and direct relationship exists between the two. That is wrong. The relationship between the two is neither strong nor direct.

An exchange has at least three sources of revenue relevant to the Proposed Order: liquidity providers, liquidity takers, and depth-of-book market data purchasers. The provision and taking of liquidity generates order flow and constitutes the trading process. Market data are a byproduct of the trading process.

A strong and direct relationship exists between order flow and prices for liquidity providers and liquidity takers. Liquidity providers are given rebates and other incentives to provide liquidity to the exchanges; those price incentives directly affect the volume of liquidity provided. Liquidity takers are charged for using this liquidity; those fees directly affect the volume of liquidity taken.

Depth-of-book data, by contrast, are a byproduct of the process of providing and taking liquidity (*i.e.*, order flow). Depth-of-book data do not directly lead to order flow and they are not priced to encourage order flow. Rather, depth-of-book data pricing reflects the value of the information provided—that is, the extent of liquidity disclosed. Exchanges charge fixed fees for each person using the data

independent of the amount of orders generated by that individual. Firms responsible for high trading volume are charged the same as firms that use the data for research purposes and do not trade at all.[31] I explain these points in more detail below.

An exchange's *trading* platform depends on the participation of *traders*. Some trading participants provide liquidity to the exchange and other trading participants take liquidity. A trade takes place only when a party offering to buy or sell at a given price meets another party that is willing to take the other side of the trade at that price. (Traders may be both liquidity providers and liquidity takers at different times for different trades.) Liquidity providers and takers are not symmetric, however, in their importance to the platform. The providers of liquidity attract users of liquidity, as well as other providers of liquidity, all of which generate trading activity for the platform.

We therefore expect prices to favor the side that is more important—orders that provide liquidity.[32] And, in fact, we observe pricing practices that offer significant incentives for liquidity providers. NYSE and Nasdaq, for example, both pay rebates to liquidity providers. For NYSE, in 2007, liquidity rebates totaled $626 million, in comparison with its net revenues of $317 million from fees for trading and access to the trading platform.[33] For Nasdaq, in 2007, liquidity rebates totaled $1,050 million, in comparison with its net revenues of $322 million from fees for trading and access to the trading platform.[34]

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[31] Indeed, the Proposed Order suggests that charging differing prices for market data depending on the purchaser's placement of order flow may be unreasonably discriminatory. *See* Proposed Order, *supra* note 3, at 32762, 32768. Our point here, however, is that fees are currently structured in a manner that does not have a direct effect on order flow.

[32] Jean-Charles Rochet & Jean Tirole, *Two-Sided Markets: A Progress Report,* 37 RAND J. OF ECON. 645 (2006).

[33] NYSE Euronext, Annual Report (Form 10-K) (March 25, 2008). Gross revenues for NYSE Group in the United States related to cash trading were $1,165 million in 2007, with net revenues of $317 million after $626 million in liquidity rebates (including payments to specialists) and $222 million in routing and clearing fees. (NYSE Group also received $86 million related to derivatives trading.)

[34] Nasdaq OMX Group, Inc., Annual Report (Form 10-K) (Feb. 25, 2008). Gross revenues for Nasdaq in the United States related to trading were $1,903 million in trading fees and $77 million in platform access fees. Nasdaq had net trading related revenues of $322 million after $1,050 million in liquidity rebates, $35 million in tape fees revenue shared with market participants for placing orders and reporting trades to Nasdaq (under two separate programs), and $575 million in brokerage, clearance and exchange fees.

Smaller trading venues offer even more aggressive liquidity rebates. For example, the BATS ECN pays a $0.0024 rebate per executed share for orders that add liquidity for Tapes A and C securities and charges a $0.0025 fee per executed share for orders that remove liquidity.[35] That is, of the $0.0025 transaction fee it receives from the taker of liquidity, it pays $0.0024 out to the trader that provided the liquidity. For Tape B securities, BATS pays *more* in a rebate ($0.0030) than it takes as a transaction fee ($0.0025).

NYSE Arca recently announced similar pricing. For Tape A and C securities, the pricing structure is inverted, including a rebate of $0.0028 for orders that add liquidity and a fee of $0.0027 for orders that take liquidity. For Tape B securities, the rebate is $0.0023 for orders that add liquidity and the fee is $0.0028 for orders that take liquidity.[36]

As the Proposed Order observes, orders that provide liquidity attract other traders to the platform. The more liquidity and trading on a given platform, the greater the number of traders that are interested in participating on that platform. Trading venues compete to attract liquidity, which generates trading volume, which in turn generates trading revenues for the platform. Accordingly, the prices that are most relevant to attracting order flow are the transaction fees, including the liquidity rebates, associated with placing orders on a trading venue.

The pricing behavior reviewed above confirms that competition for order flow among trading venues is reflected most directly in the transaction fees they charge and the liquidity rebates they offer. Each trading venue sets its transaction prices and liquidity rebates to provide direct incentives for market participants to

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[35] *See* BATS Fee Schedule, Effective July 1, 2008, *available at* http://www.batstrading.com/subscriber_resources/BATS%20Fee%20Schedule%20-%20effective%20July%201,%202008.pdf. BATS also charges a routing charge of $0.0029 for orders routed to other venues.

[36] These are NYSE Arca's fees for its most active tier of trading customers. The fees for other tiers also reflect significant liquidity rebates. NYSE Arca also charges a routing fee of $0.0029 for orders executed by another market center or participant, except on the NYSE where the routing fee is $0.0008 (or $0.0006 for customers using NYSE Arca's Primary Sweep Order). These fees are effective July 1, 2008. *See* NYSE Group, NYSE Arca Announces Unified Equities Transaction Pricing, Effective July 1 (June 19, 2008), *available at* http://www.nyse.com/press/1213870771815.html.

offer liquidity to and place orders on that venue. Supply and demand forces work as expected—fees are decreased and rebates are increased to attract more order flow.

Fees for depth-of-book data, however, do not vary with the purchaser's order flow generally or with the purchaser's order flow on the providing exchange. The exchanges therefore do not use depth-of-book data to stimulate trades, as they use rebates and fees for liquidity providers and takers. Rather, depth-of-book data are typically priced on a fixed monthly fee per device subscribed. In addition, some exchanges offer an option for an enterprise license to cover all users, a per company maximum fee cap, and a per company access fee.[37] I am not aware of exchanges' pricing their depth-of-book data based on the extent to which those data are used for orders.

B. The SEC's Conclusion that Order Flow Competition Significantly Constrains Depth-of-Book Data Pricing Is Wrong.

Based on the faulty premise that order flow and market data are two sides of the same coin, the SEC draws the conclusion that competition for order flow limits an exchange's ability to set prices for depth-of-book data. That is wrong.

Although an exchange may have an incentive to make available its depth-of-book data, the exchange nevertheless can charge prices above competitive levels for those data if the exchange is not constrained by significant competitive forces in their sale and such data have value to customers by reflecting substantial liquidity. Once a seller makes a product available, the price that the seller charges for the product is a function of the demand for the product and whether economically significant substitutes are available. In the case of depth-of-book data, the exchange will identify the profit-maximizing price for the data even if that price is higher than would be paid by a significant number of potential purchasers. The SEC implicitly recognizes that important point by noting that Nasdaq's depth-of-book product, which is presumably profitably priced, is purchased by a small percentage of Nasdaq's professional users.[38]

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[37] SEC Release No. 34-53952, *supra* note 2, at 33496-33497.

[38] *See infra* note 41.

Nasdaq's publicly reported revenue information confirms that exchanges with significant order flow have significant pricing power for their unconsolidated data.[39] In 2007, Nasdaq received consolidated data revenue of $87 million and unconsolidated data revenue of $88 million.[40] Thus, of its market data revenue, *more than half* was received from consumers of unconsolidated data. This figure is particularly striking because, according to the SEC, "only 19,000 professional users purchase Nasdaq's depth-of-book data product and 420,000 professional users purchase core data in Nasdaq-listed stocks."[41] That means that Nasdaq was able to extract more than 50 percent of its 2007 market data revenue from its sale of unconsolidated data, even though *less than 5 percent* of professional users purchased its depth-of-book data.

Furthermore, we would not expect pricing for market data to be constrained by "fierce" competition for order flow. Order flow competition implies that traders can and do switch easily among many alternative trading venues and that an exchange would have little or no leverage to charge higher prices to its trading participants. That competition appears to be reflected in the exchanges' transaction pricing and the substantial rebates they pay to liquidity providers.

By contrast, as discussed above, an exchange with substantial liquidity maintains significant leverage over the consumers of its depth-of-book data.[42] That dynamic—significant leverage over market data customers and little or no leverage over providers and takers of liquidity—results in prices for market data that reflect

[39] I discuss Nasdaq's revenues as NYSE does not report its revenues from consolidated versus unconsolidated data.

[40] This is net of $46 million in consolidated data fees that Nasdaq collects and is required (as a result of its role as the Securities Information Processor for Nasdaq-listed securities) to share with other trading venues based on their respective shares of trading in Nasdaq-listed securities.

[41] Proposed Order, *supra* note 3, at 32766. The SEC's reference to 19,000 professional users of Nasdaq's depth-of-book data may be an understatement. The Nasdaq letter cited by the SEC indicates that there were 19,000 professional users of TotalView. The Nasdaq letter did not indicate how many professional users purchased its other depth-of-book data products. *See* Letter from Jeffrey Davis, Vice President and Deputy General Counsel, The Nasdaq Stock Market, dated May 18, 2007, at 6.

[42] I have already shown in Section II that the purported alternatives offered by the SEC do not in fact provide economic substitutes for depth-of-book data and thus do not significantly constrain depth-of-book data pricing.

significant market power and prices for order flow that reflect competitive conditions.[43]

C. The Evidence on Which the SEC Relies Does Not Support the SEC's Conclusions.

The SEC presents four sources of support for its conclusion that order flow competition constrains pricing for depth-of-book data:

1. An industry textbook.

2. The Report of the SEC Advisory Committee on Market Information.

3. The strategy followed by BATS (an ECN) of not charging for market data.

4. Island's choosing not to display its order book to avoid being subject to the Inter-market Trading System (ITS) regulations and losing significant order flow.[44]

None support the SEC's conclusions.

The first two sources are statements to the effect that, in the absence of the regulatory requirement for *consolidated* data from all trading venues to be displayed, many data vendors would not display data from smaller trading venues and that those venues would therefore find it difficult to compete for order flow. Those statements do no more than acknowledge: (1) that the pricing power of market data derives from the significance of the liquidity that the market data reflect; and (2) that some degree of transparency may be an important component of a platform that is appealing to traders. Both points were discussed above, and neither establishes that competition for order flow constrains market data pricing.

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[43] The SEC asserts that, if "NYSE Arca were truly able to exercise monopoly power in pricing its non-core data, it likely would not choose a fee that generates only a small fraction of the transaction fees that admittedly are subject to fierce competitive forces." *See* Proposed Order, *supra* note 3, at 32769. That is a non-sequitur. That a firm charges fees for one product that result in total revenue that is greater or less than the total revenue from the sale of another product says nothing about the firm's market power over either product.

[44] *Id.* at 32764.

The third reference is to statements by the BATS ECN regarding its strategy of not charging for market data. That strategy is hardly surprising, as market data reflecting little liquidity have little value and the smaller trading venues that supply such data have little pricing power.

And the fourth reference is to the experience of the Island ECN when it chose not to display its order book at all to avoid the Inter-market Trading System (ITS) regulations and lost significant order flow. That experience hardly establishes that order flow constrains the prices of market data. As discussed above, even if a viable trading venue must make some of its market data available, the prices that can be charged for those data depend both on the significance of the liquidity that the data reflect and on the availability of economically significant substitutes.

Indeed, the Report of the SEC Advisory Committee on Market Information itself confirms that the larger exchanges retain market power over their data even if the smaller trading venues do not:

> Supporters of the Display Rule point out, however, that while the abandonment of the rule plainly would take away any artificial market power of the non-primary markets, it is unlikely to be a significant restraint on the pricing power of the primary markets. To the extent that market participants need the data generated by, for example, the NYSE or Nasdaq, they would still be forced to buy it. Accordingly, the absence of the Display Rule would not ensure the appropriate level of fees for the primary markets' data.[45]

In sum, the evidence proffered by the SEC suggests only the following unremarkable propositions:

- smaller exchanges cannot charge significant prices for depth-of-book data because those data do not reflect significant liquidity; and
- larger exchanges can charge prices above competitive levels for depth-of-book data because they control—as noted in Section II—a significant portion of the liquidity for each stock (*e.g.*, 53.6 percent in the case of

[45] SEC ADVISORY COMMITTEE ON MARKET INFORMATION, REPORT OF THE ADVISORY COMMITTEE ON MARKET INFORMATION: A BLUEPRINT FOR RESPONSIBLE CHANGE (Sept. 14, 2001).

NYSE Group for NYSE-listed stocks) and are not constrained by the availability of reasonably interchangeable substitutes.[46]

The SEC has presented no evidence or analysis that could support its claim that order flow and depth-of-book data are "two sides of the same coin" and that, therefore, "fierce" order flow competition necessarily constrains the exercise of significant market power in the provision of depth-of-book data.

IV. CONCLUSIONS

Scholarly literature and case law provide an analytical framework for assessing whether firms can exercise significant market power over prices and whether substitutes or other constraints discipline that market power. The SEC does not rely on that framework (or substitute a coherent one of its own) to reach its conclusion that the Exchange necessarily charges "equitable, fair, reasonable, and not unreasonably discriminatory" prices for its depth-of-book data because of "significant competitive forces."

To the contrary, economics and the relevant facts establish:

- the Exchange likely has significant market power over the pricing of its depth-of-book market data;
- the availability of the alternative sources of depth-of-book data that the SEC identifies would not constrain that market power; and
- competition for order flow would not constrain that market power.

I therefore conclude, as a matter of economics, that the SEC has presented no credible analysis or evidence to support the position that the pricing of depth-of-book data is subject to significant competitive forces.

[46] Indeed, comparing the absolute prices of several products, as the SEC does with respect to the depth-of-book products of NYSE, Nasdaq, and NYSE Arca (*see* Proposed Order, *supra* note 3, at 32769), does not speak to whether the price of any of the products reflects significant market power. The price of a given product relative to another product is a function of the demand for the given product, all else being equal. Sellers of products for which demand is relatively greater will be able to set relatively higher prices, and vice versa, even assuming the absence of economically significant substitutes for both products.

EXHIBIT B

RESPONSE TO ORDOVER AND BAMBERGER'S STATEMENT REGARDING THE SEC'S PROPOSED ORDER CONCERNING THE PRICING OF DEPTH-OF-BOOK MARKET DATA

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October 10, 2008

I. INTRODUCTION[1]

NYSE Arca, Inc. (NYSE)[2] requested the Securities and Exchange Commission (SEC) to approve a proposed rule change that would allow NYSE to establish certain fees for depth-of-book market data (also known as unconsolidated, or non-core, data).[3] The SEC has issued a Notice that presents a Proposed Order to approve that request and the basis for doing so.[4]

In my previous Report, I demonstrated that the Proposed Order's preliminary conclusion that significant competitive forces constrain NYSE's pricing of depth-of-book data is not supported by the analysis and evidence presented by the Proposed Order.[5] To the contrary, the economics and evidence show that:

- NYSE likely has significant market power over the pricing of its depth-of-book market data;
- the supposedly alternative sources of depth-of-book data that the Proposed Order identifies would not significantly constrain market power over depth-of-book data; and

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[1] This Report was prepared at the request of NetCoalition.

[2] For the purpose of analyzing competition among exchanges, all exchanges owned by the same corporate parent should be aggregated as under the control of the same economic agent, which seeks to maximize the profits of the combined operations. Indeed, NYSE Euronext itself has criticized Nasdaq for "totally ignor[ing] the NYSE Arca trading in NYSE-listed securities." Press Release, NYSE Euronext (last visited Oct. 9, 2008), http://www.nyse.com/pdfs/NYSE_Response_Letter1.pdf [hereinafter "NYSE Euronext Press Release"]. Thus, for purposes of economic analysis, the NYSE Arca and New York Stock Exchange trading venues should be considered a single entity. Ordover and Bamberger do not appear to dispute this conclusion.

[3] Filing of Proposed Rule Change Relating to Approval of Market Data Fees for NYSE Arca Data, SEC Release No. 34-53592, 71 Fed. Reg. 33,496 (June 9, 2006).

[4] Proposed Order Approving Proposal by NYSE Arca, Inc. to Establish Fees for Certain Market Data and Request for Comment, SEC Release No. 34-57917, 73 Fed. Reg. 32,751 (June 10, 2008) [hereinafter "Proposed Order"].

[5] Dr. David S. Evans, An Economic Assessment of Whether "Significant Competitive Forces" Constrain an Exchange's Pricing of Its Depth-of-Book Market Data (July 10, 2008) [hereinafter "Report"].

- competition for order flow would not prevent the exercise of significant market power over depth-of-book data.

On August 1, 2008, Nasdaq submitted a letter to the SEC urging approval of the Proposed Order and attaching a supporting Statement of Janusz Ordover and Gustavo Bamberger.[6] Those authors reach three principal conclusions:[7]

- "[E]ven though market information from one platform may not be a perfect substitute for market information from one or more other platforms, the existence of alternative sources of information can be expected to constrain the prices platforms charge for market data."[8]
- "[A] trading platform cannot generate market information unless it receives trade orders. For this reason, a platform can be expected to use its market data product as a tool for attracting liquidity and trading to its exchange."[9]
- Competition among exchanges constrains the "total return" each exchange earns from its "sale of joint products," and thus the "total price of trading on that platform" is constrained by the "total price of trading on rival platforms."[10]

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[6] Statement of Janusz Ordover and Gustavo Bamberger (Aug. 1, 2008) [hereinafter "Statement"].

[7] The argument that platform competition constrains the total return of the exchange is one that Ordover and Bamberger make throughout their submission but is not presented in their conclusions, which instead focus on the first two arguments.

In addition to the economic flaws in Ordover and Bamberger's total return analysis that are discussed in Section IV below, Ordover and Bamberger ignore an important part of the relevant landscape—namely the legal framework within which exchanges must operate. For example, NetCoalition has advised me that Congress, by way of the Exchange Act, requires an "exclusive processor" of market data (such as NYSE) that distributes quotation and transaction data to do so on terms that are "fair and reasonable" and "not unreasonably discriminatory." Proposed Order, *supra* note 4, at 32,760 & n.156.

By arguing that a relatively low price for transaction services effectively offsets a relatively high price for market data, *see* Statement, *supra* note 6, ¶¶ 8, 23 & nn.23-24, Ordover and Bamberger ignore the above-referenced statutory mandate and thereby make their economic argument largely irrelevant within the context in which U.S. exchanges must operate.

[8] Statement, *supra* note 6, ¶ 38.

[9] Statement, *supra* note 6, ¶ 38.

[10] Statement, *supra* note 6, ¶¶ 7 & 23.

Those conclusions are conceptually flawed, and the authors provide no meaningful factual support for any of them.

In Section II, I address Ordover and Bamberger's flawed claim that alternative sources of depth-of-book data act as a significant competitive constraint on the prices that a given exchange can charge for its depth-of-book data. They do not, and could not, present evidence to support that claim. Neither Nasdaq nor any smaller exchange provides depth-of-book data that are reasonably substitutable for NYSE's depth-of-book data.

In Section III, I show that Ordover and Bamberger's claim that competition for order flow acts as a significant competitive constraint on an exchange's pricing of its depth-of-book data is analytically flawed and factually inconsistent with how exchanges work. Ordover and Bamberger assume a symmetrical demand relationship between order flow and depth-of-book data where none exists. Depth-of-book data prices do not affect the marginal incentive to place orders and, therefore, do not significantly affect order flow decisions. On the other hand, depth-of-book data revenue can be used to offset the costs of liquidity rebates and discounts that attract more order flow. Additional order flow increases the value of, and the prices that an exchange can charge for, its depth-of-book data.

In Section IV, I show that Ordover and Bamberger's "total return" analysis is based on the incorrect assumption that the price of depth-of-book data is part of the marginal cost faced by broker-dealers in making trading decisions. Even if one were to assume that depth-of-book data prices were one component of the "total price of trading" on a platform, that component does not affect the marginal incentives to

execute a trade. Because depth-of-book data prices are not part of the marginal cost of executing a trade, depth-of-book data prices are not constrained by inter-platform competition for orders. Further, even if depth-of-book data and trade execution services are "joint products" with "joint costs," the price of one does not necessarily constrain the price of the other because they are sold separately and face distinct competitive conditions.

II. PRICES FOR DEPTH-OF-BOOK DATA FROM ONE EXCHANGE ARE NOT SIGNIFICANTLY CONSTRAINED BY THE AVAILABILITY OF DEPTH-OF-BOOK DATA FROM OTHER EXCHANGES

Ordover and Bamberger claim that: "[E]ven though market information from one platform may not be a perfect substitute for market information from one or more other platforms, the existence of alternative sources of information can be expected to constrain the prices platforms charge for market data."[11]

Ordover and Bamberger provide no evidence to support their claim, other than asserting that they "understand" that "many 'professional' traders . . . view depth-of-book information from NYSE Arca and Nasdaq as reasonable substitutes because all depth-of-book products are effectively proxies for liquidity that would be available should the current NBBO change."[12] That assertion is contrary to what happens in the marketplace.

As an initial matter, Ordover and Bamberger's claim applies to depth-of-book data only from NYSE and Nasdaq. That is, even assuming Ordover and Bamberger

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[11] Statement, *supra* note 6, ¶ 38.
[12] Statement, *supra* note 6, ¶ 32.

were correct that the price of NYSE's depth-of-book data constrains Nasdaq's depth-of-book data prices, that would imply a duopoly over depth-of-book data. Except for special circumstances that Ordover and Bamberger have not identified or documented, duopolies do not have competitive prices. Indeed, the variety of prices for depth-of-book data indicates the lack of a market-clearing price that one would expect in a competitive market with significant substitution among products. Highest among depth-of-book data prices are those charged by Nasdaq and NYSE, reflecting their market power over their respective depth-of-book data products, while smaller trading venues have no choice but to charge little or nothing for their depth-of-book data.[13]

Moreover, Ordover and Bamberger present no empirical evidence to support their claim as to substitutability between NYSE and Nasdaq. They do not attempt to show, for example, that traders actually do substitute between depth-of-book data from NYSE and Nasdaq, and marketplace evidence is to the contrary.

While depth-of-book data from NYSE and from Nasdaq both provide information about liquidity if the price of a security changes from the NBBO, NYSE's and Nasdaq's respective depth-of-book data reflect liquidity of different magnitudes and quality. Although Ordover and Bamberger assert that Nasdaq's and NYSE's depth-of-book data are "proxies" for each other, that assertion is contradicted by differences in the quantity and quality of liquidity across equities and

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[13] The SEC cited evidence in its Proposed Order that suggested that small trading venues may have difficulties getting distribution of their market data in the absence of display rules governing the distribution of consolidated data. *See* Proposed Order, *supra* note 4, at 32,764 n.195 (citing Larry Harris, *Trading and Exchanges, Market Microstructure for Practitioners* 99 (2003)).

by their own evidence of the volatility of the exchanges' shares of trading volume.[14] If, as Ordover and Bamberger suggest, trading volume in NYSE-listed and Nasdaq-listed stocks constantly shifts, one exchange's depth-of-book data will not provide a reliable proxy for the other's data, which may reflect significantly different liquidity as a result of volatile competition for order flow.[15]

The Security Traders Association ("STA") observes that, as a matter of marketplace reality, a broker-dealer needs the depth-of-book data feeds from each significant venue on which a given security trades for a useful perspective of available liquidity:

> We do not believe that the depth-of-book feeds from the various exchanges are fungible. Depth-of-book feeds are not substitutes for one another: NASDAQ's depth-of-book data for IBM will be different from the NYSE depth-of-book data for IBM. On the contrary, each depth-of-book data feed reflects the market conditions for a particular security on that particular venue. For a full appreciation of the liquidity available in the entire marketplace . . . as a commercial and competitive matter, a broker-dealer needs the depth-of-book feeds from each significant venue on which the security trades.[16]

Moreover, as I explained in my previous report, a market professional's need for information about a particular security can be satisfied only by data about that particular security. For example, market information about the market depth of the

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[14] Statement, *supra* note 6, ¶¶ 10-12.

[15] For example, NYSE Euronext touts itself as the "the dominant source of liquidity in NYSE-listed securities, especially in thinly traded issues" with "more volume than NASDAQ in 99.4% of NYSE-listed stocks." NYSE Euronext Press Release *supra* note 2. A customer interested in assessing the liquidity and market depth of stocks listed on the New York Stock Exchange therefore could not satisfy that interest by purchasing only Nasdaq's depth-of-book data.

[16] Bart M. Green & John Giesea, STA Comment Letter at 3 (Sept. 11, 2008), http://www.sec.gov/comments/34-57917/3457917-15.pdf. [hereinafter "STA Comment Letter"].

securities of Microsoft would not be useful to a trader seeking to determine the market depth of IBM securities. Ordover and Bamberger, however, do not address the broad variations in the liquidity of individual securities across exchanges. Nor do they explain how one set of depth-of-book data for all securities on one exchange could be reasonably substitutable for depth-of-book data for all securities on another exchange.

In sum, Ordover and Bamberger provide no meaningful evidence to demonstrate that the depth-of-book data from other trading venues significantly constrain the pricing of depth-of-book data from NYSE or Nasdaq. In my previous submission, I demonstrated that the other three supposedly alternative sources of depth-of-book data identified by the Proposed Order (NYSE's own consolidated data; "pinging" the various markets by routing oversized marketable limit orders; and the threat of independent distribution of depth-of-book data by securities firms and data vendors) are not material substitutes for an exchange's depth-of-book data.[17]

I thus conclude that no reasonably substitutable alternatives to NYSE's depth-of-book data are available to act as the "significant competitive forces" that the Proposed Order required to presume that the proposed NYSE prices are "equitable, fair, reasonable, and not unreasonably discriminatory."[18]

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[17] Report, *supra* note 5, Section II.
[18] Proposed Order, *supra* note 4, at 32,751.

III. PRICES FOR DEPTH-OF-BOOK DATA ARE NOT SIGNIFICANTLY CONSTRAINED BY COMPETITION FOR ORDER FLOW

In my previous submission, I demonstrated that competition for order flow does not significantly constrain an exchange's market power over depth-of-book data—that order flow and market data are *not* "two sides of the same coin."[19] Without addressing my analysis, Ordover and Bamberger reach the opposite conclusion, claiming that competition for attracting liquidity and trading constrains prices for depth-of-book data.[20] They rely on two propositions. First, Ordover and Bamberger state that "a trading platform cannot generate market information unless it receives trade orders."[21] Second, they assert that, "[f]or this reason, a platform can be expected to use its market data product as a tool for attracting liquidity and trading to its exchange."[22]

Ordover and Bamberger provide no economic analysis or evidence as to why the second proposition should follow from the first. In economic terms, Ordover and Bamberger are asserting that a change in the price of depth-of-book data would have a similar impact on demand for order flow as a change in the price of order flow would have on the demand for depth-of-book data. That symmetrical and reciprocal relationship does not, in fact, exist.

The following propositions demonstrate that the relationship between the demand for depth-of-book data and the demand for order flow is asymmetrical.

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[19] Report, *supra* note 5, Section III.

[20] *See, e.g.*, Statement, *supra* note 6, ¶ 6 ("In Section II, we show that competition between trading platforms constrains the price of market data sold by each platform.").

[21] Statement, *supra* note 6, ¶ 38.

[22] Statement, *supra* note 6, ¶ 38.

(1) *The input relationship between order flow and depth-of-book data is asymmetrical.* The price of depth-of-book data is at most only one of many factors considered in placing trades. NYSE has itself explained that "[t]he markets base competition for order flow on such things as technology, customer service, transactions costs, ease of access, liquidity, and transparency."[23] Changing the price of only depth-of-book data is thus unlikely to have a significant effect on the demand for transactions.

Market data are also used for purposes other than trading and, in that regard, are not an input to order flow at all. As Ordover and Bamberger explain, market data are "useful in a number of ways" that do not involve trading, including "valuing securities and portfolios," "evaluating the performance of a broker or trader," or obtaining a "barometer of market sentiment."[24] They acknowledge that market data are useful to "firms that act as intermediaries between trading platforms and the public but do not trade themselves," such as Google and Yahoo![25] For customers purchasing depth-of-book data and not placing trades on an exchange, the depth-of-book data price thus stands entirely on its own.

In contrast, order flow is the sole input for generating and increasing the value of depth-of-book data. Indeed, depth-of-book data are a byproduct of order flow. Without order flow, depth-of-book data would not exist.

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[23] Proposed Order, *supra* note 4, at 32,764 n.193 (citing Letter from Mary Yeager, Corporate Secretary, NYSE Arca, to the Honorable Christopher Cox, Chairman, Commission, dated February 6, 2007, at 16).

[24] Statement, *supra* note 6, ¶¶ 20-21.

[25] Statement, *supra* note 6, ¶ 20 n.21.

(2) *The effects of changes in prices of trading on the demand for depth-of-book data, and vice versa, are also asymmetrical.* Depth-of-book data are priced and sold separately from trade execution services. Depth-of-book data are sold in monthly subscriptions and are typically based on a fixed monthly fee per device.[26] That fixed subscription fee is independent of the amount of orders generated by the subscriber and is not expressed as part of, or affected by, trade execution services.

An exchange charges subscribers the same per-device fee whether or not they place orders on the exchange. Indeed, as the SEC recognizes, an exchange may not "unreasonably discriminate among types of subscribers, such as by favoring participants in the NYSE Arca market or penalizing participants in other markets."[27] In addition, each monthly subscription provides data on all securities traded on an exchange, and customers are charged the same price whether or not they examine the depth-of-book data for one security, all securities, or some number in between.

In contrast, each trade is executed with respect to an individual security, and exchanges charge fees (with separate discounts and rebates for trade execution services) that are separate from depth-of-book data subscription fees. The trade execution fees are determined on a transactional basis and are designed specifically to affect trading incentives and attract liquidity. Those transaction-based fees for order flow allow traders to assess the costs and benefits of placing a given trade for a given security on a given venue and thus affect traders' marginal incentives to direct order flow among exchanges.

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[26] In addition, there may be a cap on the total monthly data fees paid by each company. There may also be per-company fees for access to the datafeeds from the exchange's servers. SEC Release No. 34-53592, *supra* note 3, at 33,496-33,497.

[27] Proposed Order, *supra* note 4, at 32,768.

An increase or decrease in the monthly subscription fee for depth-of-book data, however, does not change a trader's marginal cost to purchase or sell a particular security on a particular exchange. That is, in choosing where to place the next trade, an entity would not consider the cost of the subscription fee. Likewise, in setting the depth-of-book monthly subscription fee, the exchange would consider the effect of that fee on the marginal incentive to subscribe to depth-of-book data, but not on the marginal incentive to trade generally or for a particular security.[28]

(3) *The asymmetrical relationship between the demand for order flow and depth-of-book data is illustrated by considering the consequence of a small but significant price increase for each product.*[29] A five percent increase in the monthly subscription fee for depth-of-book data would not have any material effect on the demand for order flow for two reasons. First, as noted above, the increase in the price of depth-of book data would have no effect on the price of, and therefore the marginal demand for, order flow. Second, as also noted above, depth-of-book data are just one of many inputs into the demand for order flow.

On the other hand, a five percent increase in the price of transactions might well have a material effect on order flow and thus on the demand for depth-of-book data. If increasing the price of transactions would reduce the amount of orders, it would thereby reduce the amount of, and value of, depth-of-book data. In such a

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[28] My position here and in my prior Report does not assume that no relationship whatsoever exists between the pricing of depth-of-book data and the volume of order flow. Even if some traders may deem an exchange to be a non-viable trading venue if it declines to make depth-of-book data available at all (or at an extremely high price), the level of depth-of-book data pricing within a range that includes the exercise of significant market power will not affect traders' marginal incentives as to where to place their next buy or sell order.

[29] A price increase of approximately five percent is generally viewed as small but significant. *See* U.S. Dep't of Justice and Fed. Trade Comm'n, Horizontal Merger Guidelines §1.11 (Rev. 1997).

case, the willingness of customers to pay for depth-of-book data would decline, especially if those data reflected a significant reduction in liquidity.

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Ordover and Bamberger, and the Proposed Order, have ignored the asymmetry discussed above and thus have erred in their assessment as to whether an exchange can exercise market power over depth-of-book data. Although Ordover and Bamberger recognize that depth-of-book data are a direct byproduct of order flow,[30] they do not explore the important implication of that byproduct relationship.

That relationship indicates that competition for order flow will not constrain an exchange's depth-of-book data prices and may serve to increase them. Lower order flow prices generally will increase order flow, which, in turn, will increase the value of depth-of-book data. That is, by attracting additional order flow, an exchange will not only gain the transaction fees associated with the order flow, it will also increase the amount it can charge for its depth-of-book data.

Increased depth-of-book revenue can be used to offset the costs of liquidity rebates and discounts that attract order flow. Indeed, the STA observes that "raising the market data fees would enable [the exchanges] to pay higher rebates and thus, attract more order flow."[31] We see that observation empirically verified in the case of consolidated tape data. Trading venues use revenue from consolidated tape data to compete for order flow. As Nasdaq states: "Participants in the UTP Plan have used

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[30] Statement, *supra* note 6, ¶¶ 7 & 17.
[31] STA Comment Letter, *supra* note 16, at 3.

tape fee revenues to establish payment for order flow arrangements with their members and customers."[32]

The economically rational strategy for exchanges, given the asymmetrical relationship of order flow and depth-of-book data, is thus to set lower prices for order flow, which has the effect of increasing the value of, and the prices the exchanges can charge for, their depth-of-book data.

IV. PRICES FOR DEPTH-OF-BOOK DATA ARE NOT SIGNIFICANTLY CONSTRAINED BY INTER-PLATFORM COMPETITION

Ordover and Bamberger focus on the "total return" or "aggregate return" that a platform receives from trade execution services and depth-of-book and other market data.[33] They claim that the "total price of trading" on a platform is constrained by the total price of trading on alternative platforms.[34] Ordover and Bamberger include in the price of trading the prices of (at least) market data and trade execution.[35] Ordover and Bamberger thus appear to argue that, even if an exchange charges relatively high prices for market data, inter-platform competition will cause those market data prices to be effectively offset by relatively low prices for other products or services offered by the exchange, such as providing access to liquidity.[36]

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[32] Nasdaq Stock Market, Inc., Annual Report (Form 10-K), at 17 (Feb. 25, 2008).
[33] Statement, *supra* note 6, ¶ 7.
[34] Statement, *supra* note 6, ¶ 23.
[35] Statement, *supra* note 6, ¶ 23 & nn.23-24.
[36] Statement, *supra* note 6, ¶¶ 7-8, 23 & nn.23-24.

Even if one assumes that depth-of-book data prices are a component of the "total price of trading," as discussed in the previous section, that component does not affect the marginal incentives of a broker-dealer to execute a trade. On the other hand, transaction fees can and do affect order flow decisions. Thus, while inter-platform competition for trading may constrain the prices of trade execution services, it does not significantly constrain depth-of-book data fees.

Ordover and Bamberger further attempt to advance their "total return" argument by characterizing trade execution services and market data as "joint products" with "joint costs" and by asserting that trading platform competition will necessarily constrain the total return from those joint products.[37] To the contrary, where two "joint products" of the same facility are sold separately—as trade execution services and depth-of-book data are—the pricing of each product is determined by the distinct competitive conditions that each product confronts.

A classic example of joint products with joint costs is the production of wool and mutton. Wool and mutton are joint products of a sheep, and many of the costs of producing both products (*i.e.*, the care, feeding, and handling of the sheep) are the same. However, the demand conditions for wool could be independent of those for mutton.

Suppose, for example, that market conditions are such that only one firm can produce desirable wool (because its sheep have much better wool than its competitors' sheep), while many firms can produce desirable mutton (because the

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[37] Statement, *supra* note 6, ¶ 7 ("Competition among trading platforms can be expected to constrain the aggregate return each platform earns from its sale of joint products . . . .").

mutton from all sheep is perfectly substitutable). Under those conditions, the competition to produce mutton, however intense it might be, will not significantly constrain the monopoly wool producer's pricing of wool. If other firms cannot produce wool of satisfactory quality, the monopoly wool producer will face no competition in the pricing of wool, even as the pricing of mutton faces intense competition. Of course, that is unlikely to be the case for sheep farmers—our point is only that the existence of joint costs/joint products does not ensure a particular competitive outcome in either product market.

In the case of trading venues, competition for order flow does not significantly constrain depth-of-book data pricing simply because they are viewed as joint products. Regardless of competitive conditions for trade execution, an exchange can charge supracompetitive prices for depth-of-book data if the exchange does not face significant competitive constraints in the sale of such data and such data have value by reflecting substantial liquidity. As demonstrated in my previous report and Sections II and III above, that is the case here.

V. CONCLUSION

As explained above, Ordover and Bamberger's unsupported assertion that supposedly alternative sources of depth-of-book data act as a competitive constraint on an exchange's depth-of-book data is contradicted by empirical evidence. Data from different trading venues are not meaningfully substitutable. Exchanges with significant liquidity thus may charge prices for depth-of-book data that would exceed competitive levels.

In addition, Ordover and Bamberger's claim that competition for order flow acts as a significant competitive constraint on an exchange's pricing of its depth-of-book data incorrectly assumes a symmetrical and reciprocal relationship between the demand for, and the pricing of, order flow and depth-of-book data. In fact, their relationship is asymmetrical and results in an incentive to charge lower order flow prices and higher depth-of-book data prices.

Finally, Ordover and Bamberger's assertion that depth-of-book data prices are constrained by inter-platform competition for trading incorrectly assumes that the cost of depth-of-book data is part of the marginal cost of trading. In fact, depth-of-book data prices do not affect broker-dealers' marginal incentives to place trades. Nor does labeling depth-of-book data and trade execution services as "joint products" with "joint costs" make one a constraint on the pricing of the other. Each must be assessed in light of the individual competitive conditions that it confronts. Here, the lack of reasonably interchangeable sources of depth-of-book data provides exchanges with significant market power over the pricing of those data.

I conclude by reiterating the main propositions from my prior Report:

- NYSE likely has significant market power over the pricing of its depth-of-book market data;
- the supposedly alternative sources of depth-of-book data that the Proposed Order identifies would not significantly constrain market power over depth-of-book data; and
- competition for order flow would not prevent the exercise of significant market power over depth-of-book data.