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Joint Industry Plans; Notice

SECURITIES AND EXCHANGE COMMISSION

[Release No. 34–74892; File No. 4–657]

Joint Industry Plans; Order Approving the National Market System Plan To Implement a Tick Size Pilot Program by BATS Exchange, Inc., BATS Y-Exchange, Inc., Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc., NASDAQ OMX BX, Inc., NASDAQ OMX PHLX LLC, The Nasdaq Stock Market LLC, New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc., as Modified by the Commission, for a Two-Year Period

May 6, 2015.

I. Introduction

On August 25, 2014, NYSE Group, Inc., on behalf of BATS Exchange, Inc., BATS Y-Exchange, Inc., Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc. (''FINRA''), NASDAQ OMX BX, Inc., NASDAQ OMX PHLX LLC, the Nasdaq Stock Market LLC, New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc., (collectively ''SROs'' or ''Participants''), filed with the Securities and Exchange Commission (''Commission''), pursuant to Section 11A of the Securities Exchange Act of 1934 (''Act''),[1] and Rule 608 thereunder,[2] a proposed national market system (''NMS'') *Plan to Implement a Tick Size Pilot Program* on a one-year basis (''NMS plan'').[3] The Participants filed the NMS plan to comply with an order issued by the Commission on June 24, 2014 (''June 2014 Order'').[4] The NMS plan, which included the details of Participants' proposal of the Tick Size Pilot Program (''Tick Size Pilot''), was published for comment in the **Federal Register** on November 7, 2014.[5] The Commission received 77 comment letters in response to the NMS plan.[6] On

[1] 15 U.S.C. 78k–1.

[2] 17 CFR 242.608.

[3] *See* Letter from Brendon J. Weiss, Vice President, Intercontinental Exchange, Inc., to Secretary, Commission, dated August 25, 2014.

[4] *See* Securities Exchange Act Release No. 72460 (June 24, 2014), 79 FR 36840 (June 30, 2014).

[5] *See* Securities and Exchange Act Release No. 73511 (November 3, 2014), 79 FR 66423 (''Notice'').

[6] *See* Letters from John Richardson, dated August 26, 2014 (''Richardson Letter''); Arthur T. Ling, dated August 26, 2014 (''Ling Letter''); Dan Blecha, dated August 26, 2014 (''Blecha Letter''); Tom Sosnoff, dated August 27, 2014 (''Sosnoff Letter''); Michael Choffy, dated August 28, 2014 (''Choffy Letter''); Joseph Runsdorf, dated August 29, 2014 (''Runsdorf Letter''); Tony J. Gagliano, dated September 1, 2014 (''Gagliano Letter I''); Howard L. Greenblatt, dated September 2, 2014 (''Greenblatt Letter''); Ernest Callipari, dated September 2, 2014 (''Callipari Letter''); Ali Bangura, dated September 3, 2014 (''Bangura Letter''); Tony J. Gagliano, dated September 3, 2014 (''Gagliano Letter II''); Theodore R. Lazo, Managing Director and Associate General Counsel of Securities Industry and Financial Markets Association (''SIFMA''), dated September 9, 2014 (''SIFMA Letter I''); John C. Nagel, Managing Director and Sr. Deputy General Counsel of Citadel, LLC, dated September 12, 2014 (''Citadel Letter I''); Christopher Nagy, CEO, and Dave Lauer, President, KOR Group LLC, dated September 15, 2014 (''KOR Letter I''); Stuart J. Kaswell, Executive Vice President & Managing Director, General Counsel of Managed Funds Association, dated September 20, 2014 (''MFA Letter I''); John Daley, Chairman of the Board and James Toes, President & CEO of Security Traders Association, dated September 23, 2014 (''STA Letter I''); Brian A. Johnson, Executive Director for Research of Committee on Capital Markets Regulation, dated September 26, 2014 (''CMR Letter I''); Jeffrey P. Ricker, dated October 6, 2014 (''Ricker Letter''); David Adorney, Professional Equity Trader, dated November 11, 2014 (''Adorney Letter''); Richard B. Gorelick, CEO of RGM Advisors, LLC, dated November 13, 2014 (''RGM Letter''); Representative Sean P. Duffy, U.S. House of Representatives, dated November 17, 2014 (''Duffy Letter''); Joseph Galinskie, dated November 18, 2014 (''Galinskie Letter''); Tom Quaadman, Vice President, U.S. Chamber of Commerce, Center for Capital Markets Competitiveness, dated November 20, 2014 (''CCMC Letter I''); David Shields, Vice Chairman & Co-CEO, Wellington Shields & Co., dated December 2, 2014 (''Wellington Shields Letter''); Dave Weild, Chairman & CEO, IssuWorks, Inc., dated December 3, 2014 (''IssuWorks Letter''); Tim Quast, President, ModernNetworks IR, LLC, dated December 8, 2014 (''ModernNetworks Letter''); Larry Tabb, Founder & CEO, Tabb Group, dated December 10, 2014 (''Tabb Letter''); John Endean, President, American Business Conference, dated December 12, 2014 (''ABC Letter''); Scott Kupor, Managing Partner, Andreessen Horowitz and Jeffrey M. Solomon, CEO Cowen and Company; Equity Capital Formation Task Force, dated December 18, 2014 (''ECFTF Letter''); Eduardo A. Repetto, Co-Chief Executive Officer and Co-Chief Investment Officer, Dimensional Fund Advisors, dated December 18, 2014 (''DFA Letter''); Sal Arnuk and Joseph Saluzzi, Partners and Co-Founders, Themis Trading, LLC, dated December 19, 2014 (''Themis Letter''); Simon D. Yates, CEO, Two Sigma Securities, LLC, dated December 19, 2014 (''Two Sigma Letter''); Mortimer J. Buckley, Managing Director and Chief and Investment Officer, The Vanguard Group, Inc., dated December 19, 2014 (''Vanguard Letter''); Rob Flatley, CEO and Dave Weisberger, MD, Head of Market Structure Analysis, CoreOne Technologies LLC, submitted December 19, 2014 (''CoreOne Letter''); Alan F. Hill, CEO and William K. Jones, Executive Chairman, JonesTrading Institutional Services LLC, dated December 19, 2014 (''JonesTrading Letter''); R. Glenn Hubbard, Co-Chair, John L. Thornton, Co-Chair and Hal S. Scott, Director, Committee on Capital Markets Regulation, dated December 19, 2014 (''CMR Letter II''); John Daley, Chairman of the Board and James Toes, President & CEO, Security Traders Association, dated December 19, 2014 (''STA Letter II''); John McCarthy, General Counsel, KCG Holdings, Inc., dated December 19, 2014 (''KCG Letter''); Douglas A. Cifu, Chief Executive Officer, Virtu Financial, dated December 19, 2014 (''Virtu Letter''); E. Cartier Esham, Executive Vice President, Emerging Companies, Biotechnology Industry Organization, dated December 22, 2014 (''BIO Letter''); Micah Hauptman, Financial Services Counsel, Consumer Federation of America, dated December 22, 2014 (''CFA Letter''); Bobby Franklin, President & CEO, National Venture Capital Association, dated December 22, 2014 (''NVCA Letter''); Eric Swanson, General Counsel and Secretary, BATS Global Markets, Inc. dated December 22, 2014 (''BATS Letter''); Theodore R. Lazo, Managing Director and Associate General Counsel, SIFMA, dated December 22, 2014 (''SIFMA Letter II''); Daniel G. Weaver, Ph.D., Professor of Finance, Director, Master of Financial Analysis Program, Associate Director, Whitcomb Center for Research in Financial Services, Rutgers, The State University of New Jersey, dated December 22, 2014 (''Weaver Letter''); Stuart J. Kaswell, Executive Vice President & Managing Director, General Counsel, Managed Funds Association, dated December 22, 2014 (''MFA Letter II''); Kurt N. Schacht, Managing Director and James C. Allen, Head, CFA Institute, dated December 22, 2014 (''CFA Institute Letter''); Robert J. McCarthy, Director of Regulatory Policy, Wells Fargo Advisors, LLC, dated December 22, 2014 (''Wells Fargo Letter''); Daniel Keegan, Managing Director, Head of Equities for the Americas, Citigroup Global Markets Inc., dated December 22, 2014 (''Citigroup Letter''); Richie Prager, Managing Director; Hubert DeJesus, Managing Director; Supurna Vedbrat, Managing Director; Joanne Medero, Managing Director, BlackRock, Inc., dated December 22, 2014 (''BlackRock Letter''); Adam Sussman, Head of Market Structure, Liquidnet, Inc., dated December 22, 2014 (''Liquidnet Letter''); Manisha Kimmel, Managing Director, Financial Information Forum, dated December 22, 2014 (''FIF Letter''); Tom Quaadman, Vice President, U.S. Chamber of Commerce, Center for Capital Markets Competitiveness, dated December 22, 2014 (''CCMC Letter II''); Ari Burstein, Senior Counsel, Investment Company Institute, dated December 22, 2014 (''ICI Letter''); Jeff Brown, Senior Vice President, Legislative and Regulatory Affairs, Charles Schwab & Co., Inc., dated December 22, 2014 (''Schwab Letter''); Kimberly Unger, CEO and Executive Director, Security Traders Association of New York, dated December 22, 2014 (''STANY Letter''); Scott C. Goebel, Senior Vice President & General Counsel, Fidelity Management & Research Co., dated December 22, 2014 (''Fidelity Letter''); Dennis Dick, CFA, Head, Equity Market Structure, Bright Trading LLC, dated December 22, 2014 (''Bright Trading Letter''); Raymond M. Tierney III, President and Chief Executive Officer, Gary Stone, Chief Strategy Officer, Bloomberg Tradebook LLC dated December 22, 2014 (''Bloomberg Letter''); Mao Ye, Assistant Professor of Finance, University of Illinois, Urbana-Champaign, dated December 22, 2014 (''Ye Letter''); Paul J. Jiganti, Managing Director, Market Structure and Client Advocacy and John S. Markle, Deputy General Counsel—Retail and Clearing Operations, TD Ameritrade, Inc., dated December 22, 2014 (''TD Ameritrade Letter''); James J. Angel, Ph.D., CFA, Associate Professor of Finance, Georgetown University dated December 22, 2014 (''Angel Letter''); Christopher Nagy and Dave Lauer, KOR Group, LLC dated December 22, 2014 (''KOR Letter II''); James G. Ongena, General Counsel, Chicago Stock Exchange, Inc., dated December 22, 2014 (''CHX Letter''); Andrew Stevens, General Counsel, IMC Financial Markets, dated December 30, 2014 (''IMC Letter''); Michael Jacejko, Chief Executive Manager, Birch Bay Capital, LLC, dated December 31, 2014 (''Birch Bay Letter''); James P. Selway III, Managing Director, Head of Electronic Brokerage, ITG Inc., dated January 5, 2015 (''ITG Letter''); John C. Nagel, Managing Director & Sr. Deputy General Counsel, Citadel LLC, dated January 5, 2015 (''Citadel Letter II''); Thomas Wittman, Executive Vice President, The NASDAQ OMX Group, LLC, dated January 16, 2015 (''Nasdaq Letter''); Brendon J. Weiss, Co-Head Government Affairs, NYSE, LLC, dated January 16, 2015 (''NYSE Letter''); Senators Mark R. Warner and Pat Toomey, The United States Senate, dated January 23, 2015 (''Warner-Toomey Letter''); Daniel Zinn, General Counsel, OTC Markets Group Inc., dated February 24, 2015 (''OTC Markets Letter''); Jared Albert, dated March 10, 2015 (''Albert Letter''); Representative Juan Vargas, U.S. House of Representatives, dated March 27,

February 26, 2015, the Commission extended the deadline for Commission action on the NMS plan and designated May 6, 2015 as the new date by which the Commission would be required to take action.[7] This order approves the NMS plan, as modified by the Commission, for a two-year period. A copy of the NMS plan, as modified by the Commission, is attached as *Exhibit A* hereto.

II. Background

Since the inception of decimalization [8] in 2001, there has been a significant shift in the nature of trading, the structure of the markets, and the roles of market participants. In the context of decimalization, market participants and others have raised concerns that the shift to quoting and trading in the one penny minimum price variation may have had a detrimental impact on the market quality for securities of small and middle capitalization companies. For example, a few studies issued after the implementation of decimalization raised questions regarding whether decimalization has reduced incentives for underwriters to pursue public offerings of smaller companies, limited the production of sell-side research for small and middle capitalization companies and made it less attractive to become a market maker in the shares for smaller companies.[9]

In 2012, the Jumpstart Our Business Startups Act (''JOBS Act'') [10] directed the Commission to conduct a study and report to Congress on how decimalization affected the number of initial public offerings (''IPOs''), and the liquidity and trading of securities of smaller capitalization companies.[11] The JOBS Act also provided that the Commission could, by rule, designate a minimum increment for the securities of emerging growth companies [12] that is greater than $0.01 but less than $0.10 for use in all quoting and trading of securities in any exchange or other execution venue, if the Commission determined that such securities should be quoted and traded using a minimum increment of greater than $0.01.[13]

The Commission submitted the staff study to Congress in July 2012 (''Decimalization Report'').[14] The Decimalization Report did not reach any firm conclusions about the impact of decimalization on the number of IPOs or the liquidity and trading of the securities of small capitalization companies.[15] However, based on the information considered in the Decimalization Report, staff recommended that ''[t]he Commission should not proceed with the specific rulemaking to increase tick sizes, as provided for in Section 106(b) of the JOBS Act, but should consider additional steps that may be needed to determine whether rulemaking should be undertaken in the future.'' [16] The Decimalization Report suggested a public roundtable, where recommendations could be presented on a pilot program that would generate data to allow the Commission to further assess decimalization's impact.

The Commission staff convened a Decimalization Roundtable, in February 2013, with broad participation from market participants, academics and others, including an issuer representative. Many panelists believed that factors other than decimalization were more significant contributors to the decline of IPOs in recent years. Although participants offered diverging views on the likely outcome of any increase in the minimum tick size, there was broad support among the panelists for the Commission to conduct a pilot program to gather further information, particularly with respect to the impact of wider tick sizes on liquidity in the securities of small capitalization companies. Some panelists, however, expressed concern about the potential costs to investors of wider minimum tick sizes.[17]

In June 2014, the Commission issued the June 2014 Order, pursuant to Section 11A(a)(3)(B) of the Act,[18] directing the Participants to act jointly in developing and filing with the Commission an NMS plan to implement a pilot program that, among other things, would widen the quoting and trading increment for certain small capitalization stocks.[19] The Commission issued the June 2014 Order to further study and assess the impact of decimalization on the securities of small capitalization companies. Pursuant to the June 2014 Order, on August 25, 2014, the Participants filed the proposed NMS plan.[20]

As discussed in detail throughout this order, the Commission believes that the Tick Size Pilot, as reflected in the proposed NMS plan, and subject to the modifications prescribed by the Commission, should support further examination and analysis on the impact of tick sizes on the trading and liquidity of the securities of small capitalization companies. The Commission believes that altering tick sizes could result in significant market-wide benefits and improvements to liquidity and capital formation. Yet, as discussed in detail below, these changes could also impose costs, including on investors resulting from larger spreads. Because of the potential significance of the benefits and costs, as well as the uncertainty that currently exists about the likely outcome of changing tick sizes, the Commission believes it is appropriate to test these important issues in a way that can produce robust results that informs future policy making. The Tick Size Pilot is therefore, by design, an objective, data-driven test that is designed to evaluate how a wider tick size would impact trading, liquidity, and market quality of securities of smaller capitalization companies. The Commission believes that the Tick Size Pilot, as now constructed, is necessary to provide for a test that can produce robust results that will allow the Commission to effectively test the potential benefits and costs of permanently changing tick sizes for smaller capitalization stocks.

2015 (''Vargas Letter''); and Atsushi Saito, Director and Representative Executive Officer, Group CEO, Japan Exchange Group, Inc., received April 17, 2015 (''Saito Letter''). The Commission received two comment letters after the June 2014 Order was issued and before the proposed NMS plan was submitted. These comment letters are included in the comment file with the other comment letters received in response to the NMS plan. *See also* Letters from Shawn Leary, dated August 24, 2014 (''Leary Letter''); and Tony BenBrahim, dated August 24, 2014 (''BenBrahim Letter'').

[7] *See* Securities and Exchange Act Release No. 74388, 80 FR 12054 (March 5, 2015).

[8] Decimalization refers to setting the tick size at penny increments. A tick is the minimum pricing increment that can be used to trade securities. Prior to 2001, securities in the U.S. equity markets were generally quoted and traded in fractional tick sizes, ranging from $1/32 or $1/64 for low-priced securities to $1/8 or $1/4 for higher-priced securities.

[9] *See* June 2014 Order, *supra* note 4, for a complete discussion of the background on decimalization.

[10] Jumpstart Our Business Startups Act, Pub. L. 112–106, 126 Stat. 306 (2012).

[11] Section 106(b) of the JOBS Act. 15 U.S.C. 78k–1(c)(6).

[12] An ''emerging growth company'' is defined in the Securities Act of 1933 (''Securities Act'') and the Act as an issuer with total annual gross revenues of less than $1 billion during its most recently completed fiscal year. *See* Section 2(a)(19) of the Securities Act and Section 3(a)(80) of the Act.

[13] *Id.*

[14] *Report to Congress on Decimalization* (July 2012) available at *http://www.sec.gov/news/studies/2012/decimalization-072012.pdf.*

[15] *See* Decimalization Report *supra* note 13. *See also* June 2014 Order *supra* note 4 (describing the Decimalization Report).

[16] *Id.*

[17] Information about the Decimalization Roundtable, including the transcript, comment letters and list of panelists is available at *http://www.sec.gov/spotlight/decimalization.shtml*.

[18] 15 U.S.C. 78k–1(a)(3)(B).

[19] *See* June 2014 Order *supra* note 4.

[20] *See* NMS plan *supra* note 3.

The Commission believes that the potential magnitude of the benefits that would be revealed by the Tick Size Pilot justify the costs of running these tests. The effect of wider tick sizes for small capitalization stocks on trading, liquidity, and market quality is not clear and the Tick Size Pilot will provide data to analyze any such effects. A wider tick size for small capitalization stocks may change the composition of market participants for these stocks as well as the behavior of market participants. The wider tick size may incentivize market makers to increase their market making activities in these stocks. This, in turn, may attract more investors and with increased interest in those stocks, trading activity may increase, which may also improve liquidity and market quality. There are many interconnected dimensions to trading, liquidity, and market quality. If a wider tick size leads to more active market making and attracts more investors to small capitalization stocks, we may observe positive effects on trading, liquidity, and market quality as measured by metrics such as trading volume, displayed depth, effective spreads, or execution costs for small and large trades.

Improved liquidity and market quality would be desirable for any stock, but would be particularly beneficial for small capitalization stocks because these stocks tend to be difficult and/or expensive to trade, which may discourage investment. Were there to be improved liquidity, investors and issuers would benefit. Investors would benefit because it would be easier and less expensive for them to trade in these stocks. Issuers would benefit from improved liquidity and market quality in two ways. First, more trading activity and investor attention may make an issuer's stock more attractive, which may reduce the company's cost of capital as well as increase their opportunities to raise capital. Second, improved liquidity may reduce an issuer's cost of capital because stocks with higher liquidity tend to have lower cost of capital. Consequently, improved liquidity may reduce liquidity risk and translate into lower cost of capital.[21] We expect these benefits would manifest during the Pilot Period if they are in fact present.

The Commission, however, recognizes that these benefits may not manifest in the manner or to the extent anticipated. And, as noted above, we cannot know in advance the full effects, whether they be positive or negative, of a wider tick size on the market behavior of market participants in response to the Tick Size Pilot. As discussed in detail below, the Commission has seriously considered the concerns about costs that implementation of the Tick Size Pilot would create for market participants and the complexity of the Tick Size Pilot, and has tried to mitigate both where possible without undermining the objectives of the Tick Size Pilot. The Commission nevertheless believes that incurring the costs of the Tick Size Pilot is appropriate in these circumstances. The Tick Size Pilot will provide the Commission and interested parties with real-world data regarding the effect of wider tick sizes on trading, liquidity and market quality for small-capitalization companies, and this empirical data will inform analyses and potential future regulatory actions to, among other things, capture any benefits from wider tick sizes on a permanent basis.[22]

Therefore, the Commission finds that the NMS plan is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of, a national market system, or otherwise in furtherance of the purposes of the Act.

III. Description of the Proposed NMS Plan and the Tick Size Pilot

The NMS plan filed by the Participants contained provisions to implement the Tick Size Pilot,[23] including provisions related to the administration and operation of the Tick Size Pilot, the data to be collected and made public, and the specific assessments to be conducted by the Participants. In this section, the proposed NMS plan is described, and further below there is discussion and analysis of the comments received and the NMS plan, as approved with Commission modifications.

A. Criteria for Pilot Securities

Section V of the NMS plan sets forth five criteria for selection of NMS common stocks[24] that would be included in the Tick Size Pilot (''Pilot Securities''). The five criteria for determining the Pilot Securities are: (1) a market capitalization[25] of $5 billion or less on the last day of the Measurement Period;[26] (2) a Closing Price[27] of at least $2.00 on the last day of the Measurement Period; (3) a Closing Price on every U.S. trading day during the Measurement Period that is not less than $1.50; (4) a Consolidated Average Daily Volume (''CADV'')[28] during the Measurement Period of one million shares or less; and (5) a Measurement Period Volume-Weighted Average Price (''VWAP'')[29] of at least $2.00. Further, the Participants proposed that an NMS

[21] *See, e.g.,* Amihud, Y., Mendelson, H., *Asset pricing and the bid-ask spread,* 17 Journal of Financial Economics 223, (1986); Easley, D., Hvidkjaer, S. O'Hara, M., *Is Information Risk a Determinant of Asset Returns?,* 57 Journal of Finance 2185 (2002); Easley, D., O'Hara, M., *Information and the Cost of Capital,* 59 Journal of Finance 1553 (2004); Acharya, V., Pedersen, L., *Asset Pricing with Liquidity Risk,* 77 Journal of Financial Economics 375 (2005).

[22] The Commission notes that certain commenters believed that the Tick Size Pilot could provide valuable data and should be studied notwithstanding its potential costs. *See* Tabb Letter at 8; CFA Institute Letter at 2; CHX Letter at 17; Nasdaq Letter at 5–6; and NYSE Letter at 3.

[23] *See* NMS plan *supra* note 3.

[24] The NMS plan defines NMS common stock as an NMS stock that is common stock of an operating company. *See* NMS plan Section (I)(Q). NMS stock means any NMS security other than an option. *See* 17 CFR 242.600(b)(47). NMS security means any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan, or an effective national market system plan for reporting transactions in listed options. *See* 17 CFR 242.600(b)(46).

[25] The NMS plan calculates market capitalization by multiplying the total number of shares outstanding on such day by the Closing Price of the security on such date. *See* NMS plan Section (V)(A)(1).

[26] The NMS plan defines Measurement Period as the U.S. trading days during the three calendar month period ending at least 30 days prior to the effective date of the Pilot Period. *See* NMS plan Section (I)(N). The NMS plan defines Pilot Period as the operative period of the Tick Size Pilot, lasting one year from the date of implementation. *See* NMS plan Section (I)(U). As discussed further below, in response to comments and after additional consideration, the Commission has modified the market capitalization threshold to lower it to $3 billion or less. In addition, as discussed further below, in response to comments and after additional consideration, the Commission has modified the definition of Pilot Period to extend the duration of the Tick Size Pilot to two years. *See infra* Section V.B.

[27] The NMS plan defines Closing Price as the closing auction price on the primary listing exchange or if not available, the last regular-way trade reported by the processor prior to 4:00 p.m. ET. *See* NMS plan Section (I)(H). The NMS plan defines processor as the single plan processor responsible for the consolidation of information for an NMS stock pursuant to Rule 603(b) of Regulation NMS. *See* NMS plan Section (I)(Y).

[28] The NMS plan calculates CADV by adding the single-counted share volume of all reported transactions in the Pilot Security during the Measurement Period and dividing by the total number of U.S. trading days during the Measurement Period. *See* NMS plan Section (V)(A)(4).

[29] The NMS plan calculates the Measurement Period VWAP by calculating the volume-weighted average price for each U.S. trading day during the Measurement Period, summing the daily volume-weighted average price across the Measurement Period, and dividing by the total number of U.S. trading days during the Measurement Period. *See* NMS plan Section (V)(A)(5).

common stock for an issuer that had its IPO within 6 months of the start of the Pilot Period would not be eligible to be a Pilot Security.

B. Assignment of Pilot Securities

As proposed in the NMS plan, the Tick Size Pilot would consist of three Test Groups, with each Test Group consisting of 400 Pilot Securities. The Pilot Securities that are not placed in the Test Groups would be placed in the Control Group.

The Operating Committee [30] of the NMS plan would oversee the process of assigning the Pilot Securities into the Control Group and the three Test Groups. First, the Pilot Securities would be placed into a maximum of 27 categories by means of a stratified random sampling process. Each Pilot Security would be categorized as: (1) low, medium, or high share price based on the Measurement Period VWAP; (2) low, medium, or high market capitalization based on the last day of the Measurement Period; and (3) low, medium, or high trading volume based on the CADV during the Measurement Period. Each category (share price, market capitalization, trading volume) would then be divided into three sub-categories, each containing a third of the securities in the category. This process would yield 27 categories. However, if a single category contained fewer than ten securities, such category would be combined with another category that contains at least ten securities. If two or more categories contained fewer than ten securities each, those categories would be combined, provided that the combined category contains at least ten securities. If the combined category contains fewer than ten securities, then such category would be combined with another of the 27 categories that contains at least ten securities.

After the categories are finalized, the Pilot Securities would then be randomly selected from each category to be included in the three Test Groups, based on the percentage of Pilot Securities in such category. Each category would be represented in all three Test Groups based on the category's relative proportion to the population of Pilot Securities. Similarly, a primary listing exchange's securities would be selected from each category and included in the three Test Groups.

Each primary listing exchange would, free of charge, make publicly available on its Web site the list of Pilot Securities that are listed on such exchange and that are included in the Control Group and Test Groups. Appendix A to the NMS plan provides the specific details about the data that each exchange would make available on its Web site to identify the Pilot Securities.

C. Control Group and Test Groups

As noted above, the Tick Size Pilot would contain a Control Group and three Test Groups, each of which has incrementally different quoting and trading requirements.

1. Control Group

Pilot Securities in the Control Group would continue to be quoted and traded at any price increment currently permitted.

2. Test Group One: Widened Quote Increment

Pilot Securities in Test Group One would have a quoting increment of $0.05 but could continue to trade at any currently permitted price increment. The Participants would be required to adopt rules that would prohibit the Participants or any member of a Participant from displaying, ranking, or accepting from any person any displayable or non-displayable bids or offers, orders, or indications of interest in increments other than $0.05. Orders priced to execute based on the midpoint and orders entered in a Participant-operated retail liquidity program [31] could be ranked and accepted in increments of less than $0.05.

3. Test Group Two: Widened Quote and Trade Increment

Pilot Securities in Test Group Two would have the same quoting increment as Test Group One ($0.05) along with the applicable quoting exceptions, but could only be traded in $0.05 minimum increments. The Participants would be required to adopt rules that prohibit trading centers operated by the Participants and members of the Participants from executing orders in any Pilot Security in Test Group Two in price increments other than $0.05. The $0.05 trading increment would apply to all trades, including brokered cross trades, absent an exception.

Three exceptions to the $0.05 trading increment would be applicable. First, trading could occur at the midpoint of the National Best Bid (''NBB'') and the National Best Offer (''NBO'' and together with NBB, ''NBBO''),[32] or the midpoint of the best protected bid and the best protected offer.[33] Second, Retail Investor Orders [34] could be executed with price improvement of at least $0.005 better than the best protected bid or the best protected offer. Finally, Negotiated Trades [35] could trade in increments less than $0.05.

4. Test Group Three: Widened Quote and Trade Increment With a Trade-At Prohibition

Pilot Securities in Test Group Three would be subject to the same quoting and trading increments as those in Test Group Two as well as the same exceptions. However, the trading of these securities would also be subject to a trade-at prohibition.[36] The trade-at

[30] *See* NMS plan Section (III)(C) on the composition of the Operating Committee. Each Participant will have one individual staff member to represent the Participant on the Operating Committee.

[31] *See* NASDAQ OMX BX Rule 4780; BATS Y Rule 11.24; NYSE Rule 107C; NYSE MKT—Equities Rule 107C and NYSE Arca Equities Rule 7.44.

[32] *See* 17 CFR 242.600(b)(42).

[33] *See* 17 CFR 242.600(b)(57).

[34] *See* NMS plan Section (I)(DD) (defining Retail Investor Order as ''an agency order or a riskless principal order originating from a natural person, provided that, prior to submission, no change is made to the terms of the order with respect to price or side of market and the order does not originate from a trading algorithm or any other computerized methodology. The Participant that is the DEA of a member of a Participant operating a trading center executing a Retail Investor Order will require such trading center to sign an attestation that substantially all orders to be executed as Retail Investor Orders will qualify as such under the [NMS] [p]lan'').

[35] *See* NMS plan Section (I)(P) (defining Negotiated Trades as ''(i) a Benchmark trade, including, but not limited to, a VWAP trade or a Time-Weighted Average Price trade, provided that, if such trade is composed of two or more component trades, each component trade complies with the quoting and trading increment requirements of the [NMS] [p]lan, or with an exception to such requirements, or (ii) a Pilot Qualified Contingent Trade.''). The NMS plan defines a Benchmark trade as ''the execution of an order at a price that was not based, directly or indirectly, on the quoted price of a Pilot Security at the time of execution and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made.'' *See* NMS plan Section (I)(C). The NMS plan defines Pilot Qualified Contingent Trade as ''a transaction consisting of two or more component orders, executed as agent or principal, where: (1) at least one component order is in an NMS common stock; (2) all components are affected with a product or price contingency that either has been agreed to by the respective counterparties or arranged for by a broker-dealer as principal or agent; (3) the execution of one component is contingent upon the execution of all other components at or near the same time; (4) the specific relationship between the component orders (*e.g.,* the spread between the prices of the component orders) is determined at the time the contingent order is placed; (5) the component orders bear a derivative relationship to one another, represent different classes of shares of the same issuer, or involve the securities of participants in mergers or with intentions to merge that have been announced or since canceled; and (6) the transaction is fully hedged (without regard to any prior existing position) as a result of the other components of the contingent trade.'' *See* NMS plan Section (I)(V).

[36] A ''trade-at'' is defined under the NMS plan as an execution by a trading center of a sell order for a Pilot Security at the price of a protected bid or the execution of a buy order for a Pilot Security at the price of a protected offer. *See* NMS plan Section (I)(LL). As discussed further below, after additional

Continued

prohibition, as defined under the NMS plan, would'' (1) prevent a trading center that was not quoting from price-matching protected quotations and (2) permit a trading center that was quoting at a protected quotation to execute orders at that level, but only up to the amount of its displayed size'' (''Trade-At Prohibition''). Specifically, the Participants would be required to adopt rules prohibiting trading centers operated by the Participants and members of the Participants from executing a sell order for a Pilot Security at the price of a protected bid, or from executing a buy order for a Pilot Security at the price of a protected offer, unless such executions fall within certain enumerated exceptions.

The NMS plan contains thirteen exceptions to the Trade-At Prohibition. These exceptions describe when a trading center would be permitted to execute an order for a Pilot Security at a price equal to a protected bid or protected offer. The first exception would be for when an order is executed by a trading center that is displaying a quotation, via either a processor or an SRO quotation feed, at a price equal to the traded-at protected quotation, but only up to the trading center's full displayed size (''Size Limitation''). A further condition to this exception proposed by the Participants would limit trading centers' ability to execute an incoming order by requiring that executions occur on the venue where the protected quote was displayed. Specifically, the Participants proposed that where the quotation is displayed through a national securities exchange, the execution at the size of the order must occur against the displayed size on such national securities exchange (''Exchange Venue Limitation''). Where the quotation is displayed through the Alternative Display Facility (''ADF'') or another facility approved by the Commission that does not provide execution functionality, the execution of the order must occur against the displayed size in accordance with the rules of the ADF or such approved facility (''ADF Venue Limitation'' together with Exchange Venue Limitation, ''Venue Limitation'').[37]

In addition, the NMS plan provides that Block Size orders [38] and Retail Investor Orders executed with at least $0.005 price improvement would be excepted from the Trade-At Prohibition. These exceptions were also set forth in the June 2014 Order.

The next exceptions (numbers 4 through 12) are based on the exceptions that are found in Rule 611 of Regulation NMS.[39] Specifically, the NMS plan provides that trading centers would be permitted to execute an order for a Pilot Security at a price equal to a protected bid or protected offer in the following situations: (1) when the trading center displaying the protected quotation that was traded-at was experiencing a failure, material delay, or malfunction of its systems or equipment; (2) when an order is executed as part of a transaction that was not a ''regular way'' contract; (3) when an order is executed as part of a single-priced opening, reopening, or closing transaction by the trading center; (4) when a protected bid was priced higher than a protected offer in the Pilot Security; (5) when an order is identified as an Intermarket Sweep Order; (6) when an order is executed by a trading center that simultaneously routed Trade-at Intermarket Sweep Orders [40] to execute against the full displayed size of the protected quotation that was traded-at; (7) when the order is executed as part of a Negotiated Trade; (8) when the trading center displaying the protected quotation that was traded-at, had displayed, within one second prior to execution of the transaction that constituted the trade-at, a best bid or best offer, as applicable, for the Pilot Security with a price that was inferior to the price of the trade-at transaction; and (9) when the order executed by a trading center which, at the time of order receipt, the trading center had guaranteed an execution at no worse than a specified price (''stopped order'') where: (A) the stopped order was for the account of a customer; (B) the customer agreed to the specified price on an order-by-order basis; and (C) the price of the trade-at transaction was, for a stopped buy order, equal to the NBB in the Pilot Security at the time of execution or, for a stopped sell order, equal to the NBO in the Pilot Security at the time of execution.

Lastly, the NMS plan contains an exception for an order of a fractional share of a Pilot Security, provided that such fractional share order was not the result of breaking an order for one or more whole shares of a Pilot Security into orders for fractional shares or was not otherwise effected to evade the requirements of the Trade-At Prohibition or any other provisions of the Tick Size Pilot.

D. Collection and Assessment of Tick Size Pilot Data

1. Trading Center Data

The Participants would be responsible for collecting data specified in Appendix B of the NMS plan, which generally includes daily market quality statistics, data on specific orders, and data on market makers [41] (''Trading Center Data'').[42] In addition, each Participant that is the Designated Examining Authority (''DEA'') [43] of a member of a Participant operating a trading center would require such member to collect and provide to the DEA data related to daily market quality statistics and data related to specific orders consistent with the terms and conditions specified in Appendix B of the NMS plan. The Participants and each member of a Participant operating a trading center would also be required to collect such data for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. Each Participant would make available to other Participants a list of members designated as market makers on that Participant's trading center.

On a monthly basis, the Participants and the DEA for each member of a

consideration, the Commission modified the definition of trade-at to clarify that it applies during Regular Trading Hours. *See infra* Section V.D.4.

[37] As discussed further below, in response to comments and after additional consideration, the Commission has modified the NMS plan to remove the Venue Limitation. *See infra* Section V.D.4.d.

[38] *See* 17 CFR 242.600(b)(9). As discussed further below, in response to comments and after additional consideration, the Commission has modified the definition of Block Size for purposes of the Tick Size Pilot. *See infra* Section V.D.4.e.

[39] 17 CFR 242.611.

[40] The NMS plan defines Trade-at Intermarket Sweep Orders as ''a limit order for a Pilot Security that meets the following requirements: (1) When routed to a trading center, the limit order is identified as an Intermarket Sweep Order; and (2) Simultaneously with the routing of the limit order identified as an Intermarket Sweep Order, one or more additional limit orders, as necessary, are routed to execute against the full displayed size of any protected bid, in the case of a limit order to sell, or the full displayed size of any protected offer, in the case of a limit order to buy, for the Pilot Security with a price that is equal to the limit price of the lit order identified as an Intermarket Sweep Order. These additional routed orders also must be marked as Intermarket Sweep Orders.'' *See* NMS plan Section (I)(MM).

[41] A ''market maker'' is defined under the NMS plan as ''a dealer registered with any self-regulatory organization, in accordance with the rules thereof, as (i) a market maker or (ii) a liquidity provider with an obligation to maintain continuous, two-sided trading interest.'' *See* NMS plan Section (I)(L).

[42] *See* NMS plan Appendix B.

[43] A DEA is defined under the NMS plan as ''the self-regulatory organization responsible for (i) examining such member for compliance with the financial responsibility requirements imposed by the Exchange Act, or by Commission or self-regulatory organization rules, (ii) receiving regulatory reports from such member, (iii) examining such member for compliance with, and enforcing compliance with, specified provisions of the Exchange Act, the rules and regulations thereunder, and self-regulatory organization rules, and (iv) carrying out any other specified regulatory functions with respect to such member.'' *See* NMS plan Section (I)(I).

Participant operating a trading center would make the specified Trading Center Data publicly available on their Web sites for free and would report such data to the Commission on a disaggregated basis by trading center. The publicly available data would not identify the trading center that generated the data.

2. Market Maker Profitability Data [44]

Each Participant that is the DEA of a market maker would require such market maker to provide the DEA the data specified in Appendix C of the NMS plan regarding daily market maker trading profits with respect to the Pilot Securities on a monthly basis (''Market Maker Profitability Data''). Each market maker would also be required to provide to its DEA the Market Maker Profitability Data for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. Moreover, on a monthly basis, the DEA would aggregate the Market Maker Profitability Data and make the aggregated data publicly available via the DEA's Web site for free, and report such data to the Commission. The publicly available data would not identify the market makers that generated the data.

3. Assessment of Tick Size Pilot Data

The Participants proposed to provide to the Commission, and make publicly available, a joint assessment of the impact of the Tick Size Pilot, no later than six months after the end of the Pilot Period.[45] As proposed, the assessment would include the statistical and economic impact of an increase in the quoting increment related to: (1) market quality, (2) the number of market makers, (3) market maker participation, and (4) market transparency.[46] The assessment would also evaluate:

- whether any market capitalization, daily trading volume, or other thresholds can differentiate the results of the above assessment across stocks;
- the statistical and economic impact of the above assessments for the incremental impact of the trading increment and for the joint effect of an increase in both the quoting increment and the trading increment;
- the statistical and economic impact of the above assessments for the incremental impact of a Trade-At Prohibition and for the joint effect of an increase in the quoting increment, an increase in the trading increment, and a Trade-At Prohibition; and
- any other economic issues that Participants believe the Commission should consider in any rulemaking that may follow. The Participants may also individually submit to the Commission, and make publicly available, an additional supplemental assessment of the impact of the Tick Size Pilot.

E. Policies and Procedures

Pursuant to the NMS plan, the Participants and members of Participants would be required to establish, maintain, and enforce written policies and procedures that are reasonably designed to comply with the quoting and trading increments for the Pilot Securities. Each Participant would develop appropriate policies and procedures that provide for collecting and reporting to the Commission the Trading Center Data. Each Participant that is the DEA of a member of a Participant operating a trading center would require such member to develop appropriate policies and procedures for collecting and reporting the Trading Center Data to the DEA. Each Participant that is the DEA of a member of a Participant operating a trading center would develop appropriate policies and procedures for collecting and reporting the Trading Center Data to the Commission.

Further, each Participant that is the DEA of a market maker would require such market maker to develop policies and procedures for collecting the Market Maker Profitability Data and report it to the DEA. Each Participant that is the DEA of a market maker would develop appropriate policies and procedures that provide for collecting and reporting such data to the Commission on an aggregated basis.[47] The DEA would also develop policies and procedures reasonably designed to ensure the confidentiality of the non-aggregated data it receives from market makers.

F. Additional Components of the NMS Plan

In addition to setting forth the details of the Tick Size Pilot, the NMS plan contains operational details including provisions related to the admission of new participants, amendments, the composition and responsibilities of the Operating Committee, and withdrawal from the NMS plan.

IV. Summary of Comments

As noted above, the Commission received 77 comment letters on the Tick Size Pilot contained in the proposed NMS plan.[48] Thirty-three commenters generally supported the Tick Size Pilot,[49] although almost all of these commenters suggested that certain aspects of the proposed Tick Size Pilot be modified prior to approval and implementation.[50] Several of the

[44] As discussed further below, in response to comments and after additional consideration, the Commission has modified the Market Maker Profitability Data requirement. *See infra* Section V.E.2.

[45] As discussed further below, in response to comments and after additional consideration, the Commission has modified the NMS plan to require the assessment to be submitted to the Commission 18-months after the implementation of the Tick Size Pilot. *See infra* Section V.E.3.

[46] As discussed further below, in response to comments and after additional consideration, the Commission has modified the NMS plan to require the Participants to conduct an assessment on market maker profitability. *See infra* Section V.E.3.

[47] The Market Maker Profitability Data would be aggregated by Pilot Security.

[48] *See supra* note 6. The opinions' of the commenters are nuanced as many commenters support certain aspects of the NMS plan while opposing other aspects of the NMS plan. Eighteen comment letters were received in response to the Commission's press release announcing that the proposed NMS plan and Tick Size Pilot had been submitted. These comment letters are included in the comment file with the comment letters received in response to the Notice. The Commission notes that five of the comment letters received in response to the press release requested that the Commission provide an extended comment period. *See* CMR Letter I; MFA Letter I; KOR Letter I; SIFMA Letter I; and Citadel Letter I. *See also* CCMC Letter I. The Investor Advisory Committee (''IAC'') established by Section 911 of The Dodd-Frank Act also submitted recommendations to the Commission with respect to a tick pilot. *See Recommendation of the Investor Advisory Committee Decimalization and Tick Sizes,* available at: *http://www.sec.gov/spotlight/investor-advisory-committee-2012/investment-adviser-decimilization-recommendation.pdf (''IAC Recommendations'').* The IAC's Recommendations were issued prior to the Commission's June 2014 Order. The Commission discussed the IAC Recommendations in the June 2014 Order.

[49] *See* Gagliano Letter I; Callipari Letter; Gagliano Letter II; STA Letter I; Duffy Letter; Galinskie Letter; IssuWorks Letter; Tabb Letter; ABC Letter; ECFTF Letter; Themis Letter; Two Sigma Letter; STA Letter II; KCG Letter; Virtu Letter; BIO Letter; NVCA Letter; BATS Letter; SIFMA Letter II; Weaver Letter; CFA Institute Letter; Citigroup Letter; BlackRock Letter; STANY Letter; Bright Trading Letter; Bloomberg Letter; KOR Letter II; CHX Letter; IMC Letter; Nasdaq Letter; NYSE Letter; Warner-Toomey Letter; OTC Markets Letter; and Vargas Letter.

[50] Four of these commenters, while supporting a pilot to test wider tick sizes, nevertheless questioned whether wider ticks would have a positive impact on liquidity or would support increased research for small capitalization companies. *See* Tabb Letter at 1 (''While I am a strong proponent of the Tick Size Pilot, I do not foresee positive results, such as greater research coverage, more small/mid-cap[italization] IPOs, a wider diversity of market makers, reduced impact of high-frequency traders, lower transaction costs, or better quality of equity markets.''); CFA Institute Letter at 1 (stating ''skeptic[ism] that wider trading increments for small cap[italization] stocks will enhance the liquidity of those securities. . .''); KOR Letter II at 4 (stating the ''idea that increased market making profitability will lead to better research/analyst coverage and encourage more IPOs is an idea that is out of touch with modern markets post-Regulation NMS''); and IMC Letter at 1 (noting reservations about the effect of wider ticks on IPOs and job growth). *See also* CoreOne Letter at 2 (stating that it is unlikely the Tick Size Pilot will increase the amount of research coverage for Pilot Securities).

commenters supporting the Tick Size Pilot believed that a wider tick increment would improve the quality of trading for small capitalization securities or that it is valuable to test this hypothesis.[51] Additionally, some of these commenters believed that a wider tick increment would increase depth and liquidity.[52] For example, one commenter stated that a well-designed Tick Size Pilot would ''[allow] for a true empirical test of the effects of wider spreads and limited increments in small-cap[italization] stocks [would] encourage fundamental buyers and sellers to meaningfully engage with each other.'' [53]

Conversely, twenty commenters generally opposed the Tick Size Pilot.[54] Some of these commenters were concerned that a wider tick increment would increase investor execution costs or that the Tick Size Pilot would be unduly disruptive.[55] Three commenters argued that the impact of tick sizes had already been studied.[56] One commenter noted that increasing tick sizes would impact his ability to trade efficiently.[57] Other commenters argued that wider spreads would only help market professionals at the expense of investors.[58]

Generally, commenters opposing the Tick Size Pilot were concerned about its costs to investors and the complexity of its design.[59] For example one commentator estimated ''that the [Tick] Pilot could cost investors hundreds of millions of dollars.'' [60] Other commenters stated the Tick Size Pilot would ''make it more expensive for investors to buy and sell [P]ilot [S]ecurities.'' [61] Commenters also opined that the Tick Size Pilot would increase operational risk, and heighten market complexity which would require ''a whole redesign of trading systems and algorithms.'' [62] Another commenter stated that, ''while the purported benefits of the [Tick Size Pilot] are questionable, the costs are real and significant.'' [63]

Additionally, Tick Size Pilot opponents indicated that the underlying goals of the Tick Size Pilot were not properly defined and tenuous.[64] For example, one commenter stated that the Tick Size Pilot's ''goal seems simply to find ways to drive higher profits to exchanges and some of their favored clients.'' [65]

Seventeen commenters, while providing substantive analysis and opinion, did not specifically express support for, or, opposition to, the Tick Size Pilot.[66] While the commenters generally focused on issues related to the proposed Tick Size Pilot, some also raised tangential or alternative market-based solutions such as those relating to access fees, maker-taker fee models, payment-for-order-flow, and high frequency trading.[67] For instance, nine commenters stated that the Commission should test the elimination of exchange access fees, either independently or in conjunction with the Trade-At Prohibition; [68] two commenters suggested the Commission implement a stand-alone trade-at pilot; [69] and three commenters suggested that subpenny pricing should be explored and studied.[70]

Several commenters supported the Commission's use of ''data-driven'' research to formulate market structure changes.[71] Additionally, some commenters believed that, while the Tick Size Pilot may not achieve the goal of improved liquidity for small-

[51] *See* Gagliano Letter I (arguing that five cent spreads will greatly enhance participation, volume and increase market depth); Callipari Letter; ECFTF Letter at 1; STA Letter II at 2; BIO Letter at 2; NVCA Letter at 2; BATS Letter at 1; SIFMA Letter II at 1; STANY Letter at 2; Bloomberg Letter at 2; CHX Letter at 1; Nasdaq Letter at 3; and NYSE Letter at 1.

[52] *See* Gagliano Letter I; Callipari Letter; BIO Letter at 2; NVCA Letter at 2; and NYSE Letter at 1.

[53] *See* ECFTF Letter at 1.

[54] *See* BenBrahim Letter; Richardson Letter; Ling Letter; Blecha Letter; Sosnoff Letter; Choffy Letter; Runsdorf Letter; Greenblatt Letter; Bangura Letter; Ricker Letter; DFA Letter; Vanguard Letter; CFA Letter; MFA Letter II; Wells Fargo Letter; ICI Letter; Schwab Letter; Fidelity Letter; TD Ameritrade Letter; and Citadel Letter II. *See also IAC Recommendations.*

[55] *See* Vanguard Letter at 1; CFA Letter at 4; MFA Letter II at 6 (stating more than 20% of all U.S. listed companies will be impacted by the Tick Size Pilot); Wells Fargo Letter at 4; and ICI Letter at 5. *See also IAC Recommendations.*

[56] *See* Ling Letter; Blecha Letter; and Runsdorf Letter.

[57] *See* Richardson Letter.

[58] *See* Richardson Letter; Ling Letter; Sosnoff Letter; Choffy Letter; and Bangura Letter. *See also* Greenblatt Letter (stating that expanding the tick sizes will only help market makers become wealthy).

[59] *See* DFA Letter at 2 (raising concerns that U.S. companies would incur a higher cost of capital); Vanguard Letter at 4 (stating that ''any program that increases the minimum quoting or trading increments will necessarily result in increased transaction costs to long-term investors''); MFA Letter II at 3 (expressing concern that the Tick Size Pilot would harm investors by creating unnecessary market complexities and systems risks); Wells Fargo Letter at 9 (expressing concerns about both costs to investors and complexity); Fidelity Letter at 3–4 (citing concerns both about increased trading costs for retail investors and complexity and implementation costs); TD Ameritrade Letter at 2; and Citadel Letter II at 5 (citing concerns about implementation costs, systems risks, and investor costs). *See also* IAC Recommendations.

[60] *See* TD Ameritrade Letter at 2.

[61] *See* BenBrahim Letter; Greenblatt Letter; Bangura Letter; Wells Fargo Letter at 2 (expressing opposition to increased tick sizes and increased transaction costs); and MFA Letter II at 3 (stating that artificially widening spreads and increasing trading costs would make it expensive for investors to buy and sell securities).

[62] *See* MFA Letter II at 3. *See also infra* note 74 and accompanying text.

[63] *See* Vanguard Letter at 4.

[64] *See* Vanguard Letter at 1; Wells Fargo Letter at 6; Schwab Letter at 9; and Citadel Letter II at 2. *See also* IAC Recommendations.

[65] *See* Schwab Letter at 9.

[66] *See* Leary Letter; Adorney Letter; RGM Letter; CCMC Letter I; Wellington Shields Letter; ModernNetworks Letter (noting its agreement with the premise behind wider ticks, such as discouraging arbitrage, encouraging market making and longer holding periods); CoreOne Letter; JonesTrading Letter; CMR Letter II; Liquidnet Letter; FIF Letter; CCMC Letter II; Ye Letter; Angel Letter; Birch Bay Letter; ITG Letter; Albert Letter and Saito Letter.

[67] *See* Wellington Shields Letter at 2 (subpenny pricing should be eliminated and quotes should have a time-in-force); Virtu Letter at 2 (recommending the Commission study and establish specific market maker obligations through an NMS plan and eliminate access fees); Liquidnet Letter at 1–2 (asserting that Commission should pass Rule 10b–18 prior to the Tick Size Pilot and should conduct a simplified version of the Trade-At Prohibition independently along with other market structure issues such as removing access fees, and eliminating maker-taker pricing); BIO Letter at 5 (suggesting other measures to assist small capitalization companies such as an increase in the qualifying cap for accelerated filers and as well as an exception from XBRL reporting requirements); CFA Institute at 6; ICI Letter at 6 (stating other market initiatives, such as maker-taker, should be addressed prior to the Tick Size Pilot); Birch Bay Letter at 1 (asserting all orders should have a minimum lifespan of at least one-second); Schwab Letter at 5 (stating that if the Commission wants to test order flow migration, it should reduce exchange access fees and liquidity rebates); Bright Trading Letter at 3 (suggesting that OTC market makers should be required to provide ''meaningful'' price improvement); Bloomberg Letter at 15 (suggesting that reduced access fees should be the subject of a pilot); Ye Letter at 1 (suggesting that the maker-taker fees should be analyzed); Angel Letter at 11 (suggesting that a maker-taker pilot should be conducted); and KOR Letter II at 2.

[68] *See* Virtu Letter at 2; CFA Institute at 6; Liquidnet Letter at 2 (asserting a simplified version of the Trade-At Prohibition should be tested independently along with other market structure issues such as removing access fees, and eliminating maker-taker pricing); Schwab Letter at 5; Fidelity Letter at 5 (suggesting that a trade-at prohibition should also contemplate access fees, maker-take, internalization, but noted that these were properly excluded from the Tick Size Pilot); Bright Trading Letter at 3; Bloomberg Letter at 15; Ye Letter at 1; Angel Letter at 11; and KOR Letter II at 5 (suggesting that the Trade-At Prohibition should be coupled with access fee reform or the elimination of rebates).

[69] *See* Vanguard Letter at 2 and ICI Letter at 4.

[70] *See* Greenblatt Letter; RGM Letter at 1; and MFA Letter II at 3. *But see* Wellington Shields Letter at 5 (stating subpenny pricing causes the front running of trades); Ye Letter at 2; and ModernNetworks Letter at 3 (arguing against studying subpenny pricing).

[71] *See* RGM Letter at 1; ABC Letter at 3; ECFTF Letter at 1; Two Sigma Letter at 1; KCG Letter at 6; Virtu Letter at 2; BIO Letter at 4; CFA Institute Letter at 6; BlackRock Letter at 1; STANY Letter at 2; Bloomberg Letter at 3; Angel Letter at 2; KOR Letter II at 2; IMC Letter at 2; Nasdaq Letter at 4; and OTC Markets Letter at 2.

capitalization securities, it nonetheless should be tested.[72] For example, one commenter stated, ''we believe it is worth the effort, time and money to test these ideas in the real world . . . as an important step in helping to improve the market for small capitalization companies in the future.'' [73]

A. Costs and Complexity of the Tick Size Pilot

Several commenters expressed concerns related to the costs and complexity of the Tick Size Pilot.[74] Some commenters expressed concern that trading costs of the wider tick size would be borne either by investors [75] or the brokers and institutions representing customer interest.[76] Two commenters suggested that investor costs related to the Tick Size Pilot would be at least $200 million annually.[77] Certain commenters expressed concern that the Tick Size Pilot would inflate the cost of capital for the issuers of Pilot Securities.[78]

Other commenters were concerned with the costs associated with the complexity of the Tick Size Pilot. Some commenters thought that the three Test Group design of the Tick Size Pilot would drive costs upward,[79] but several commenters more directly attributed the potential costs to the complexity caused by the inclusion of Test Group Three and its Trade-At Prohibition.[80] Some commenters opined that eliminating Test Group Three would eliminate much of the complexity related to the Tick Size Pilot.[81] In particular, certain commenters stated that the complexity and costs of the Trade-At Prohibition result from the changes to technology and programming that would be necessary for effective implementation.[82] Some commenters expressed concern that the Tick Size Pilot would lead to increased operational risks.[83] However some commenters, while acknowledging that there would be costs associated with the Tick Size Pilot, believed the Commission should move forward because of the importance of testing the impact of wider tick increments on the liquidity and market quality of securities with smaller capitalization.[84]

Certain commenters believed that the Tick Size Pilot should be subject to a cost benefit analysis pursuant to the Commission rulemaking process.[85] Some of these commenters questioned whether the costs of the Tick Size Pilot outweighed its benefits. Others commenters posited that a cost-benefit analysis, focused on the implementation costs of the Tick Size Pilot, should be completed.[86] Other commenters suggested that an assessment of investor costs should be completed prior to the implementation of the Tick Size Pilot.[87]

B. Duration of the Tick Size Pilot

Twenty-three commenters discussed whether the Pilot Period should be extended, remain as proposed, or implemented on a provisional basis.[88] Seventeen commenters opined that the Pilot Period should be longer than one-year.[89] Some of these commenters indicated that the Pilot Period should be extended to justify the associated implementation costs.[90] Others indicated that better data could be gathered with a longer Pilot Period.[91] In particular, some of these commenters opined that the data generated from a longer Pilot Period would be less likely to be skewed by short-term or aberrational events.[92] One commenter suggested that the one-year time period would make it easy to manipulate the data to produce negative outcomes.[93] Other commenters stated that additional time is necessary to allow for market participants to adjust their behavior.[94]

Some commenters also indicated that the relatively short Pilot Period could have a negative impact on participation. Several commenters indicated that due to, among other things, the complexity and cost relative to the short duration of the Pilot Period, some market participants would avoid trading Pilot Securities during the Tick Size Pilot.[95]

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72 *See* Tabb Letter at 1; Angel Letter at 1–2 (arguing that corporate issuers should set their trading increments and supporting a data-driven approach); KOR Letter II at 4; and IMC Letter at 1.

73 *See* CFA Institute Letter at 2.

74 *See* Duffy Letter at 2; DFA Letter at 2; Vanguard Letter at 4; Fidelity Letter at 3–4; TD Ameritrade Letter at 2; MFA Letter II at 3; Wells Fargo Letter at 9; ITG Letter at 4–6; and Citadel Letter II at 5.

75 *See* BenBrahim Letter; DFA Letter at 2; Vanguard Letter at 1; KCG Letter at 2–3; Wells Fargo Letter at 5; and Citadel Letter II at 5.

76 *See* DFA Letter at 1; Two Sigma Letter at 2; and TD Ameritrade Letter at 2.

77 *See* Two Sigma Letter at 2 (estimating excess trading costs of implementing Test Group Two and Three of $200 million annually) and TD Ameritrade Letter at 2 (utilizing optimistic assumptions would be $273,149,484 annually).

78 *See* DFA Letter at 2 and NVCA Letter at 7.

79 *See* DFA Letter at 2 (arguing that the Tick Size Pilot's four group design where each group has its own rules and exemptions increases both the risk and costs); MFA Letter II at 7–8 (asserting that the Tick Size Pilot ''will greatly increase complexity by creating four different trading schemes that will need to be implemented by trading centers and institutional investors . . . The financial cost for such significant systems development, coding, reprogramming and testing are likely to be meaningful.''); and Wells Fargo Letter at 9 (stating ''the costs and risks of the [Tick] Pilot would be lessened in a study involving only one control group and one test group without exceptions).

80 *See* Tabb Letter at 1; ECFTF Letter at 2; CMR Letter II at 7; KCG Letter at 14; FIF Letter at 3; and TD Ameritrade Letter at 2.

81 *See* Tabb Letter at 1; Two Sigma Letter at 3; Vanguard Letter at 5; MFA Letter II at 6; and Wells Fargo Letter at 8.

82 *See* Tabb Letter at 5–6 (stating ''[t]he programing for this . . . will be challenging, significant, and require massive testing.''); CoreOne Letter at 7; Wells Fargo Letter at 8; FIF Letter at 3; and ITG Letter at 5.

83 *See* SIFMA Letter II at 5; Wells Fargo Letter at 3; ICI Letter at 5; and Citadel Letter II at 6 (stating ''it would be unfortunate if the Commission approved a pilot that imposed such an extraordinary degree of operational risk on the markets.'').

84 *See* Tabb Letter at 8; CFA Institute Letter at 2; CHX Letter at 17 (this commenter provided an estimate of potential implementation costs for all three Test Groups of approximately $140,000 and suggested that such costs for all market centers could be in excess of $8.0 million); Nasdaq Letter at 5–6; and NYSE Letter at 3.

85 *See* Duffy Letter at 2; KCG Letter at 8–9; SIFMA Letter II at 7; MFA Letter II at 8; Wells Fargo Letter at 3; Citigroup Letter at 5; Schwab Letter at 8–9; STANY Letter at 9–10; Bloomberg Letter at 21–22; TD Ameritrade Letter at 4; ITG Letter at 4; Citadel Letter II at 3–4; Nasdaq Letter at 7; and OTC Markets Letter at 9.

86 *See* BlackRock Letter at 4; FIF Letter at 6; and Citadel Letter II at 5.

87 *See* Wells Fargo Letter at 9; SIFMA Letter II at 8; and Citadel Letter II at 5.

88 *See* Duffy Letter at 1; Galinskie Letter at 2; IssuWorks Letter at 3; Tabb Letter at 1; ABC Letter at 2; ECFTF Letter at 1–2; Themis Letter at 6; CoreOne Letter at 2; CMR Letter II at 2; STA Letter II at 7; BIO Letter at 7; CFA Letter at 6; NVCA Letter at 3–5; CFA Institute Letter at 3; BlackRock Letter at 6; Liquidnet Letter at 1; CCMC Letter II at 2; ICI Letter at 5; STANY Letter at 9; Angel Letter at 7; KOR Letter II at 3; CHX Letter at 6; and Warner-Toomey Letter at 1. See also IAC Recommendations.

89 *See* Duffy Letter at 1; Galinskie Letter at 2; IssuWorks Letter at 3; Tabb Letter at 5–6; ABC Letter at 2; ECFTF Letter at 1–2; Themis Letter at 6; CoreOne Letter at 2; CMR Letter II at 2; BIO Letter at 3; NVCA Letter at 3–5; CFA Institute Letter at 3; Liquidnet Letter at 1; STANY Letter at 9; KOR Letter II at 3; Warner-Toomey Letter at 1; and Vargas Letter at 1.

90 *See* Duffy Letter at 1; IssuWorks Letter at 3; ABC Letter at 3; NVCA Letter at 3; Liquidnet Letter at 3; STANY Letter at 9; Warner-Toomey Letter at 1; and Vargas Letter at 1. *See also* Tabb Letter at 8 (while not suggesting a longer duration, asserting that the one-year duration, which would require extensive technology development, may not be the best use of industry resources).

91 *See* ECFTF Letter at 1 (arguing that ''[a] significantly longer time period is required to gather meaningful data around whether the changes to the market structure are having the desired effects''); CoreOne Letter at 2 (stating ''it remains unclear if the [Tick] Pilot could generate meaningful data . . . given the [Tick] Pilot's length among other things.''); NVCA Letter at 4; and STANY Letter at 9.

92 *See* ECFTF Letter at 1–2; CMR Letter II at 2; NVCA Letter at 4–5; and Vargas Letter at 1.

93 *See* Duffy Letter at 1.

94 *See* Duffy Letter at 2; ECFTF Letter at 1–2; Themis Letter at 6; CMR Letter II at 2; BIO Letter at 3; SIFMA Letter II at 5–6; CFA Institute Letter at 3; and KOR Letter II at 3.

95 *See* IssuWorks Letter at 4; ECFTF Letter at 2; CMR Letter II at 7; STA Letter II at 11; NVCA Letter at 5; BATS Letter at 4; SIFMA Letter II at 6–7; FIF Letter at 6; ICI Letter at 6; Schwab Letter at 5; STANY Letter at 9; Fidelity Letter at 4; Bloomberg Letter at 13; TD Ameritrade Letter at 3; CHX Letter at 7; Citadel Letter II at 6; Warner-Toomey Letter at 4; and Vargas Letter at 1.

A number of commenters expressed concern that if market participants avoided trading Pilot Securities the assessment of the Tick Size Pilot would be frustrated by skewed data.[96]

The recommended duration for the Tick Size Pilot varied among commenters advocating for a longer Pilot Period. Four commenters stated that the Pilot Period should be extended to five-years,[97] while other commenters suggested either a two-[98] or three-year duration.[99] Some commenters opined that the Pilot Period should be longer, but did not provide a specific time period.[100] Instead of a specific time period, others suggested a range of eighteen months to five years.[101]

Six commenters stated that the Pilot Period of the Tick Size Pilot should be one-year as proposed.[102] One commenter, who advocated for a Tick Size Pilot with a one-year Pilot Period, asserted that sufficient data to analyze the effects of wider ticks could be generated within that timeframe.[103] Another commenter stated that there would need to be greater confidence in the benefits of Tick Size Pilot in order to justify a longer Pilot Period.[104]

Among the commenters advocating for a one-year Pilot Period, there was variance on whether the Tick Size Pilot should be cut off immediately after one-year[105] or remain in operation while the results are assessed.[106] One commenter stated that the Tick Size Pilot should be assessed following the first six months of the Pilot Period but that the Tick Size Pilot should still only operate for the one-year Pilot Period.[107] Five commenters offered that the Pilot Period should initially operate for one-year with the possibility of an extension if such action is supported by the data.[108] Five commenters stated that the Tick Size Pilot should continue during the final assessment of the data in order to mitigate unnecessary changes in the market.[109] Another commenter stated that the Pilot Period should be at least one-year to gather preliminary results and, if deemed appropriate, extended for a ''full economic cycle'' thereafter to determine its impact on capital formation.[110]

C. Criteria for Pilot Securities

The Commission received many comments with respect to the selection criteria for Pilot Securities. The commenters raised concerns about the proposed selection criteria, especially the market capitalization threshold, and suggested other criteria to be considered.[111]

1. Market Capitalization of Pilot Securities

Sixteen commenters argued that a $5 billion market capitalization threshold is too high.[112] Commenters argued that the market capitalization threshold should be decreased because the $5 billion threshold would capture securities not traditionally considered small capitalization securities, which are the focus of the Tick Size Pilot.[113] Two commenters believed that the $5 billion market capitalization threshold would include stocks that do not have the liquidity and market quality concerns that the Tick Size Pilot seeks to address.[114] Various commenters recommended that the market capitalization threshold for Pilot Securities be lowered from $5 billion to a range of $250 million to $2 billion.[115]

2. Other Comments on the Selection Criteria

Some commenters stated that the current volume threshold of CADV of one million shares should be altered. For example, one commenter suggested that the volume threshold should range from 300,000 shares to 500,000 shares for illiquid securities.[116] Another commenter stated that the volume threshold should be based upon the daily dollar trading value to focus on small capitalization securities.[117] One commenter opined that the volume threshold should be based upon the volume relative to the public float.[118]

3. Suggestions for Additional Selection Criteria

A number of commenters recommended that additional selection criteria should be required and recommended additional thresholds for the selection of Pilot Securities. Nine commenters opined that an average weighted daily spread of five cents or greater should be a qualifying factor to avoid artificially widening the spread and increasing transaction costs for

[96] *See* IssuWorks Letter at 4; CoreOne Letter at 7; BATS Letter at 5; SIFMA Letter II at 6; Warner-Toomey Letter at 1; and Vargas Letter at 1.

[97] *See* Duffy Letter at 1; Galinskie Letter at 2; IssuWorks Letter at 3; and Themis Letter at 6.

[98] *See* KOR Letter II at 3.

[99] *See* ECFTF Letter at 1–2 and Liquidnet Letter at 1. *See also* Vargas Letter at 1 (advocating for a longer Tick Size Pilot and stating that many experts suggested a three-year duration.).

[100] *See* Tabb Letter at 1; ABC Letter at 2; CMR Letter II at 2 (believing the Tick Size Pilot should be extended by one to two years); and CFA Institute Letter at 3.

[101] *See* CMR Letter II at 2; BIO Letter at 3 (stating a range of three to five years); NVCA Letter at 3–5 (stating the Pilot should last greater than three-years); and STANY Letter at 9 (indicating a Pilot duration of eighteen months to five-years).

[102] *See* CCMC Letter II at 2; STA Letter II at 7; CFA Letter at 6; BlackRock Letter at 6; ICI Letter at 5; and CHX Letter at 6.

[103] *See* CFA Letter at 6.

[104] *See* BlackRock Letter at 6. *See also* IAC Recommendations.

[105] *See* CCMC Letter II at 2 (asserting the Pilot should end completely following a year). *See also* BlackRock Letter at 6 (asserting that the Tick Size Pilot should have a ''finite duration and clear end date'').

[106] *See* STA Letter II at 7; FIF Letter at 6 (advocating for a preliminary assessment during the Tick Size Pilot to avoid unnecessary disruption); STANY Letter at 9 (noting that ending the Tick Size Pilot and possibly reintroducing it after the assessment would result in unnecessary risks and costs); KOR Letter II at 3; and CHX Letter at 6.

[107] *See* STA Letter II at 7.

[108] *See* STA Letter II at 7; ICI Letter at 5 (asserting that the Tick Size Pilot could only be extended for one-year if necessary); Angel Letter at 7; KOR Letter II at 3; and CHX Letter at 6.

[109] *See supra* note 106 and accompanying text.

[110] *See* Angel Letter at 7.

[111] One commenter stated that the proposed Measurement Period should be extended to the previous twelve months to verify whether any unique circumstances created any unintentional biases. *See* CFA Institute Letter at 4. *See also* FIF Letter at 1 (suggesting that the Measurement Period should be redefined to conclude seven months before the effective date of the Tick Size Pilot). Another commenter argued that consideration be given to securities that are priced under $5.00 per share. *See* IssuWorks Letter at 4.

[112] *See* ECFTF Letter at 2; Themis Letter at 3; Vanguard Letter at 6; CMR Letter II at 5; CFA Letter at 3; NVCA Letter at 6; BATS Letter at 2–3; SIFMA Letter II at 8; MFA Letter II at 5–6; Wells Fargo Letter at 8; ICI Letter at 4; Schwab at 10–11; STANY Letter at 7; Fidelity Letter at 3; Warner-Toomey Letter at 2; and OTC Markets Letter at 3–4.

[113] *See* MFA Letter II at 4; Wells Fargo Letter at 8; ICI Letter at 4; and Warner-Toomey Letter at 2 (stating ''re-examine . . . [the capitalization threshold] to remain consistent with goals of the Pilot''). Commenters stated the directive from Congress in the JOBS Act and also echoed by the Commission in the June 2014 Order was to address concerns of small capitalization securities. *See* MFA Letter II at 5–6 and KCG Letter at 10. One commenter also argued that small capitalization stocks would benefit the most from the Tick Size Pilot. *See* ECFTF Letter at 2.

[114] *See* Vanguard Letter at 6 and STA Letter II at 5.

[115] *See* ECFTF Letter at 2 (recommending lowering the threshold to $750 million); Themis Letter at 3 (recommending lowering the threshold to $2 billion); Vanguard Letter at 6 (recommending lowering the threshold to $500 million); CMR Letter II at 5 (recommending lowering the threshold to $750 million); CFA Letter at 3 (recommending lowering the threshold to $2 billion); NVCA Letter at 6 (recommending lowering the threshold to less than $1 billion); BATS Letter at 2–3 (recommending lowering the threshold to less than $1 billion); SIFMA Letter II at 8 (recommending lowering the threshold to less than $1 billion); MFA Letter II at 6 (recommending lowering the threshold to $750 million); Wells Fargo Letter at 8 (recommending lowering the threshold to $1 billion); STANY Letter at 7 (recommending lowering the threshold to $750 million); Fidelity Letter at 3 (recommending lowering the threshold to $750 million to $1 billion); and OTC Markets Letter at 3–4 (recommending lowering the threshold to $250 million).

[116] *See* CFA Letter at 3.

[117] *See* NVCA Letter at 6 (stating an appropriate average daily dollar trading value for small capitalization stocks is less than $10 million).

[118] *See* Virtu Letter at 2.

investors.[119] Other commenters stated that securities with an average spread of less than five cents would not benefit from the Tick Size Pilot because they are already very liquid.[120] Finally, two commenters suggested that including the daily turnover of a security would be a useful qualifying criterion to help determine liquidity.[121]

4. Securities Excluded from the Tick Size Pilot

Two commenters raised the possibility of regulatory arbitrage and asserted that cross-listed securities from Canada should not be eligible for the Tick Size Pilot.[122] Another commenter suggested that any security that trades below $1.00 during the Measurement Period should be eliminated from consideration as a Pilot Security. Further, the commenter stated that if a Pilot Security during the Pilot Period trades below $1.00 then its data should be removed from the Tick Size Pilot.[123] Two commenters supported the exclusion of ETFs.[124]

D. Control Group, Test Groups, and Trade-At Prohibition

A number of commenters discussed the design of the Tick Size Pilot. Two commenters opined that there were too many Pilot Securities included in each Test Group.[125] Some commenters indicated there were too many test groups, which would make the Tick Size Pilot complex to implement and difficult to assess.[126] One commenter supported the Tick Size Pilot design opining that it represented ''logical steps'' by comparing the trading environments of the test groups, and adding that ''[i]f there is an incremental effect that each change has on various quality of markets metrics, it should be apparent from the [Tick] Pilot data.'' [127] Another commenter supported the inclusion of all three Test Groups in order to ''deepen [the] understanding of the various factors impacting liquidity in [today's] fragmented market.'' [128]

Commenters suggested testing tick sizes other than the proposed $0.05 increment. Some commenters suggested that various tick size increments, both larger [129] and smaller [130] than the proposed $0.05 increment, be concurrently tested. Other commenters suggested that subpenny increments should be tested.[131] One commenter believed the $0.05 trade increment should apply to the opening and closing auctions and asked for this issue to be directly addressed in the Tick Size Pilot.[132] Conversely, another commenter suggested that the opening and closing auctions should be exempt from the Tick Size Pilot.[133]

One commenter asserted that, in order to avoid logistical and operational problems of rejecting non-conforming orders for brokers and customers, the Tick Size Pilot should permit orders that are received but not priced in $0.05 increments to be re-priced for display purposes to a permissible $0.05 increment.[134] Another commenter requested clarification on the handling of orders and quotes that are not in a proper tick increment.[135]

1. Test Group One: Widened Quote Increment

One commenter suggested that Test Group One should be eliminated in order to reduce the Tick Size Pilot's complexity.[136] Four commenters theorized that Test Group One ''probably will drive more volume to the dark pools'' because the trade increment is less than $0.05.[137] For example, one commenter stated, ''[w]ith no controls around trading increments, we will see a deterioration in market quality as more trading moves off-exchange, and lit market making is further disadvantaged.'' [138] One commenter suggested that market participants should be permitted in Test Group One to accept or rank orders in penny increments because exchanges and agency ATSs would be at a competitive disadvantage vis-à-vis broker-owned proprietary execution systems that could trade, accept and rank orders at otherwise impermissible increments.[139] One commenter stated that Test Group One should be eliminated because ''we should not be engaging in experiments that actively increase undisplayed liquidity.'' [140]

2. Test Group Two: Widened Quote and Trade Increment

The comments on Test Group Two were mainly directed at the exception for Retail Investor Orders, which is also applicable to Test Group Three. Two commenters argued that the definition of Retail Investor Order should be broadened so that it would be less burdensome to implement and applicable to more individuals.[141] Five commenters stated that an attestation should not be required, as it would be unwieldy for trading centers to surveil and attest that substantially all trades entered into the system originated from an individual.[142]

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119 *See* CoreOne Letter at 3 (advocating for using the average displayed spread for the Measurement Period); Two Sigma Letter at 2 (stating the securities meeting this criteria are approximately 25% of the NMS common stocks and would therefore be a large enough universe while minimizing the risk of increasing transaction costs to investors); CFA Letter at 3; MFA Letter II at 7 (asserting that the spread on some qualifying securities could increase by 500%); CFA Institute Letter at 4; Wells Fargo Letter at 9; Schwab Letter at 10–11; and OTC Markets Letter at 3–4. *See also* KCG Letter at 10 (arguing that artificially wider spreads will increase transaction costs).

120 *See* CFA Letter at 3 (stating that ''securities with $0.01 spreads are already highly liquid and actively traded''); MFA Letter II at 7; and Schwab Letter at 10–11.

121 *See* CMR Letter II at 3–4 and STA Letter II at 4–5.

122 *See* STA Letter II at 9 and SIFMA Letter II at 10.

123 *See* CHX Letter at 2.

124 *See* CFA Institute at 4 (stating that the exclusion recognizes their different shareholder base) and ICI Letter at 4.

125 *See* STA Letter II at 5–6 and BATS Letter at 3 (arguing that the number of Pilot Securities per Test Group should be reduced to 100 securities). *But see* CFA Institute at 4 (asserting that 400 securities per Test Group are appropriate for ''more robust analysis'').

126 *See* STA Letter II at 5 (arguing that the Tick Size Pilot should have only one test group); KCG Letter at 3 (asserting the Tick Size Pilot should include only Test Group One, but generally supports Test Groups One and Two); MFA Letter II at 6 (arguing that the Tick Size Pilot's ''broader scope will likely frustrate the Commission's ability to assess the impact of increased tick sizes on liquidity for small-cap[italization] stocks''). *See also supra* note 81 and accompanying text (advocating for the elimination of Test Group Three). *See also infra* note 136 and accompanying text (asserting Test Group One should be eliminated).

127 *See* CHX Letter at 11.

128 *See* NYSE Letter at 3.

129 *See* IssuWorks Letter at 3 (advocating to study $0.10 or larger trade increments); CoreOne Letter at 3 (suggesting testing $0.02 and $0.10 trade increments); and OTC Markets Letter at 4 (stating the Commission should review trade increments of $0.10 and $0.25).

130 *See* CoreOne Letter at 3.

131 *See* Greenblatt Letter; RGM Letter at 2 (suggesting the Commission look into subpenny trade increments); and MFA Letter II at 3 (asserting that the Commission should test half-penny increments for highly liquid securities).

132 *See* FIF Letter at 2.

133 *See* Citigroup Letter at 6.

134 *See* ITG Letter at 6–7 (noting that for purposes of order display and regulatory compliance, ''price-sliding'' is permissible in the context of Rule 201 of Regulation SHO).

135 *See* FIF Letter at 2.

136 *See* KOR Letter II at 3.

137 *See* Wellington Shields Letter at 4 (arguing that market participants may be hesitant to display liquidity in instances where the quoting increment is changed without corresponding changes to the minimum trading increment); Tabb Letter at 3 (forecasting that off-exchange volume to rise to between 60–70% from its current range of lower to mid-40%); CFA Letter at 4; and KOR Letter II at 3 (stating that ''as constructed, [Trade Group One] will simply divert flow from lit markets to dark pools and internalizers.'').

138 *See* KOR Letter II at 3.

139 *See* BATS Letter at 3.

140 *See* CFA Letter at 4.

141 *See* Wells Fargo Letter at 5 and FIF Letter at 2.

142 *See* Tabb Letter at 5; Two Sigma Letter at 2; KCG Letter at 9 (noting that the definition of Retail Investor Order was too complex and ambiguous and would lead to many of the largest retail firms to not sign the required attestations); STANY Letter at 6; and TD Ameritrade at 5.

Other commenters requested clarification of the Retail Investor Order definition.[143] One commenter questioned whether the definition of Retail Investor Order in the Tick Size Pilot was consistent with that of the Retail Liquidity Programs at various exchanges.[144] Another commenter suggested that the Retail Investor Order definition should be based on the ''individual customer'' account type definition used by FINRA's OATS.[145]

Other commenters supported the Tick Size Pilot's proposed exception for Retail Investor Orders.[146] Two other commenters thought the exception for Retail Investor Orders should apply generally to all orders, including institutional orders.[147] One commenter opined that the exception should be broadened to alleviate the implementation burden.[148]

Seven commenters opposed the Retail Investor Order exception because the minimum price improvement required by the exception was not large enough.[149] Some of these commenters were concerned that the relatively low level of required price improvement needed to qualify for the exception would encourage internalization.[150] Some of these commenters also believed that the wider spread warranted a more significant amount of price improvement relative to the spread.[151]

Some commenters opposed the exception for Retail Investor Orders for other reasons.[152] For instance, one commenter believed that all Tick Size Pilot pricing should be in $0.05 increments to effectively attract liquidity and market makers and thus the Retail Investor Order exception could undermine the validity of the Tick Size Pilot.[153] Another commenter argued that in light of the highly desirable nature of retail order flow, the elimination of the exception would encourage more displayed liquidity.[154] Another commenter was concerned that the Retail Investor Order exception would cause price competition to be prioritized, and negatively impact the Tick Size Pilot because of its view that markets that compete mostly on price are generally unable to compete on the value provided by, for instance, research, sales, and capital commitment.[155] This commenter stated that the tick size must have ''integrity'' in order to attract investor interest, and did not think, among other things, that the Retail Investor Order exception made ''economic sense.'' [156]

3. Test Group Three: Widened Quote and Trade Increment With a Trade-At Prohibition

The Commission received many comments on Test Group Three, and in particular, on the Trade-At Prohibition. Twenty-seven commenters opposed the Trade-At Prohibition.[157] These commenters generally believed that the Trade-At Prohibition was overly complex [158] and would be costly to implement and operate,[159] and could induce market participants to opt-out of quoting and trading in Test Group Three Pilot Securities.[160] Some of these commenters opined that the Tick Size Pilot data could be distorted if a number of market participants were to forego quoting and trading in the Test Group Three Pilot Securities because of the Trade-At Prohibition.[161] Other commenters argued that the Trade-At Prohibition would increase costs for investors.[162] One commenter pointed to Australian and Canadian rules[163] as evidence that market quality would be adversely affected and as a justification to not implement trade-at domestically.[164] Finally, three commenters supported testing the Trade-At Prohibition and encouraged

[143] *See* Two Sigma Letter at 2; KCG Letter at 9; STANY Letter at 6; Fidelity Letter at 7 (seeking clarification on whether there is a restriction on who the contra party may be for a Retail Investor Order); and TD Ameritrade Letter at 5–6.

[144] *See* TD Ameritrade Letter at 7–8.

[145] FINRA's Order Audit Trail System (''OATS'') is a FINRA owned automated reporting system that captures order information in NMS stocks and OTC equity securities that is required for all FINRA members. *See* FINRA Rule 7410(k). OATS defines an individual customer account type as ''an account that does not meet the definition of FINRA Rule 4512(c) and is also not a proprietary account.'' *See* FIF Letter at 2.

[146] *See* Virtu Letter at 2 (supporting the mid-point, retail, block size, and single-priced transactions exceptions in the Tick Size Pilot) and CHX Letter at 13.

[147] *See* SIFMA Letter II at 9 and Citadel Letter II at 8–9.

[148] *See* SIFMA Letter II at 9.

[149] *See* Galinskie Letter at 2; CFA Letter at 5; Weaver Letter at 2; CFA Institute Letter at 6; STANY Letter at 6; IMC Letter at 2; and Birch Bay Letter at 1.

[150] *See* IMC Letter at 2 and Birch Bay Letter at 1 (asserting that the exception would also undermine the Trade-At Prohibition of Test Group 3). *See also* Wells Fargo Letter at note 19 (asserting that the number of exceptions, especially the retail price improvement exception, would render the data inconclusive).

[151] *See* Galinskie Letter at 2 (arguing for ''meaningful'' price improvement); CFA Letter at 5; IMC Letter at 2 (advocating for price improvement of fifty-percent of the tick size); and Birch Bay Letter at 1 (arguing that price improvement should be a full five-cent improvement).

[152] *See* Wellington Shields Letter at 4; IssuWorks Letter at 5; and KOR Letter II at 4. *See also* Galinskie Letter at 2 (arguing that subpenny trading should be eliminated across all markets).

[153] *See* Wellington Shields Letter at 4 (arguing that the midpoint exception should be eliminated because it provides price improvement to the liquidity taker but prevents public order interaction with a liquidity provider, which the commenter suggests is not necessarily a market benefit.). *See also* Bright Trading Letter at 2 (opining that the Retail Order exception will increase the toxicity of the order flow, which will result in market makers widening their quote spreads or not quoting at all).

[154] *See* KOR Letter II at 4. This commenter also opined that the retail price improvement exception would increase payment-for-order-flow stating, ''With tick sizes at a penny, internalizers had little leeway in how much they could pay for orders, as they are generally only profiting at a fraction of the spread. By blowing out spreads but excluding retail trades at the midpoint, the result will be a dramatic increase in PFOF rates.''

[155] This commenter believes that pure price competition would not attract more liquidity. *See* IssuWorks Letter at 5.

[156] *See* IssuWorks Letter at 5.

[157] *See* STA Letter I at 3; Tabb Letter at 5–6; ECFTF Letter at 2; Two Sigma Letter at 2–3; Vanguard Letter at 5 (stating that while it is opposed to including the Trade-At Prohibition in the Tick Size Pilot, it supports a trade-at prohibition for the overall market if it is coupled with the elimination of maker-taker pricing); CoreOne Letter at 7; JonesTrading Letter at 1 (stating that Trade-At Prohibition is not related to the purpose of the Tick Size Pilot); CMR Letter II 5–8; STA Letter II at 6; KCG Letter at 11–17; NVCA Letter at 7; BATS Letter at 4–6; SIFMA Letter II at 4; MFA Letter II at 7–8; Wells Fargo Letter at 5–6; Citigroup Letter at 2; BlackRock Letter 2–3; Liquidnet Letter at 2; ICI Letter at 3–4; Schwab Letter at 4; STANY Letter at 5–6; Fidelity Letter at 5; Bloomberg Letter at 16; TD Ameritrade Letter 2–4; KOR Letter II at 4–5; ITG Letter at 4–5; Citadel Letter II at 6; and OTC Markets Letter at 7–9.

[158] *See* Tabb Letter at 5 (noting that the Trade-At Prohibition would introduce significant market structure complexity); ECFTF Letter at 2 (stating the belief that Trade-At Prohibition introduces an unnecessary layer of complexity); STA Letter II at 6; ICI Letter at 4; ITG Letter at 3 (noting that the Trade-At Prohibition introduces unnecessary levels of complexity and associated unintended consequences); and Citadel Letter II at 6–7.

[159] *See* MFA Letter II at 7 (expressing concerns that Test Group Three would exponentially increase the complexity and cost of the Tick Size Pilot) and Citigroup Letter at 4 (noting that overwhelming majority of the cost of the Tick Size Pilot can be attributed to the Trade-At Prohibition).

[160] *See* CoreOne Letter at 7 (noting that an unintended consequence of Trade-At Prohibition is that a number of market participants will elect to trade using third parties or not trade at all in Test Group Three in order to avoid the cost of implementation).

[161] *See* Two Sigma Letter at 3 and CoreOne Letter at 7 (noting that opting-out would potentially compromise the validity of the results and cast doubt on whether the results could be extrapolated to a broader based, final rule).

[162] *See* CMR Letter II at 3 (noting that the inclusion of a Trade-At Prohibition without also addressing related issues like exchange access fees and backup systems could harm investors and increase the likelihood of extreme adverse market events); Schwab Letter at 2 (noting concerns that the Trade-At Prohibition will have on execution quality and cost for retail investors); and Citadel Letter II at 5.

[163] *See* Australian Securities and Investment Commission Market Integrity Rule 4.1.1 and Investment Industry Regulatory Organization of Canada Universal Market Integrity Notice 12–0130.

[164] *See* BlackRock Letter at 2. *But see* CFA Institute Letter at 2–3 (asserting that despite the negative market quality effects of trade-at rules internationally, the NMS plan should be implemented domestically as it could lead to valuable information).

the Commission to simultaneously reduce the market access fee cap.[165]

Ten commenters that opposed the Trade-At Prohibition nevertheless recommended modifications related to the provision should the Commission approve the Tick Size Pilot with the Trade-At Prohibition.[166] These other commenters' recommendations included, among other things, changing the scope of the Trade-At Prohibition,[167] and changing the retail price improvement exception.[168]

Fourteen commenters supported testing the Trade-At Prohibition.[169] Five commenters supported the Trade-At Prohibition as proposed.[170] Certain commenters expressed their belief that the Trade-At Prohibition could enhance displayed liquidity[171] and provide valuable information to the Commission.[172] Several commenters argued that the Trade-At Prohibition should apply to all securities not just Pilot Securities.[173] One commenter suggested that interested parties should not prejudge the efficacy of the Trade-At Prohibition and stated that ''studying the impact of tick increments and display priority will benefit emerging growth companies regardless of whether the [Tick Size Pilot] leads to the permanent adoption of five-cent tick increments, national display priority, a Trade-At rule, or any other rule.''[174] Another commenter, while skeptical about the benefits of the Trade-At Prohibition, supported its inclusion in the Tick Size Pilot in order to ''gather hard evidence to help make the case . . . whether trade-at is a good idea.''[175] Several commenters believed that the Trade-At Prohibition would support the price discovery mechanism and mitigate the migration of displayed interest to off-exchange trading venues.[176] Many of these commenters argued that the Trade-At Prohibition should be included in the Tick Size Pilot in order to mitigate this potential migration of trading.[177]

a. Protected Quotations Standard

Several commenters discussed the use of the protected quotation standard rather than the NBBO for the Trade-At Prohibition. Some commenters were concerned that using the protected quotation standard would protect less competitive prices and undermine price competition[178] or would be too onerous.[179] While other commenters favored using the protected quotation standard as a means to encourage posting lit quotations.[180] Two commenters requested that the protected quotation standard be clarified.[181]

b. SRO Quotation Feed

One commenter supported the use of an SRO Quotation Feed to post and execute trades at the protected quote.[182] This commenter stated that this feature would assist trading centers which cannot publish their own protected quotation.

c. Size Limitation

Several commenters discussed the Tick Size Pilot's Size Limitation.[183] Commenters specifically took issue with the restriction prohibiting a trading center from immediately accessing its hidden, reserve interest that is at a protected price.[184] Several commenters were concerned the Size Limitation would inhibit execution quality and create risks of information leakage.[185]

[165] *See* Virtu Letter at 2; CFA Institute Letter at 6; and Bright Trading Letter at 3. *See also* KOR Letter II at 5.

[166] *See* KCG Letter at 11–17; NVCA Letter at 7; BATS Letter at 5–6 (noting that Trade-At Prohibition should only apply to protected NBBO, not protected quotes and executing against nondisplayed orders when the market is crossed); SIFMA Letter II at 4; BlackRock Letter at 2–3; Liquidnet Letter at 2 (noting that the thirteen exceptions are too complex); STANY Letter at 5–6; Bloomberg Letter at 15 (opining that there are less burdensome alternatives to the proposed Trade-At Prohibition, including reduced access fees, permitting issuers enter into contracts with market makers to set their own spreads, and implementing a trade-at prohibition that is more consistent with the June 2014 Order); KOR Letter II at 4–5; and Citadel Letter II at 7.

[167] *See* BATS Letter at 5 (noting that Trade-At Prohibition should only apply to protected NBBO, not protected quotes); SIFMA Letter II at 7 (noting that broker-dealers should be able to internalize without any size limitation if they are quoting at the NBBO); BlackRock Letter at 2 (stating that non-displayed liquidity at NBBO should be allowed to execute); KOR Letter II at 5 (supporting a simplified Trade-At Prohibition independently); and Citadel Letter II at 7 (noting that the Trade-At Prohibition should not prohibit a trading center from executing more than displayed size).

[168] *See* KCG Letter at 9 (stating the proposed Retail Investor Order definition is too complex); STANY Letter at 6 (stating that the price improvement of the Retail Investor Order exception needs to be greater and the attestation should be amended); KOR Letter II at 4 (stating that the Retail Investor Order exception would offset the purpose of the Trade-At Prohibition to promote the execution of displayed liquidity and should be eliminated); and Citadel Letter II at 8–9 (noting that all orders should have price improvement exception and exchange retail programs should not receive special treatment).

[169] *See* Adorney Letter; Wellington Shields Letter at 5; Themis Letter at 2 (expressing concerns for the exceptions to Trade-At Prohibition as overly complex); Virtu Letter at 2; BIO Letter at 4; CFA Letter at 5–6; CFA Institute Letter at 5 (stating the Tick Size Pilot as well as the Trade-At Prohibition would be a ''useful exercise''); Bright Trading Letter at 2; Angel Letter at 10–11; CHX Letter at 17; IMC Letter at 2; Birch Bay Letter at 1 (stating strong support for the Trade-At Prohibition to curtail internalization); Nasdaq Letter at 4; and NYSE Letter at 3.

[170] *See* Adorney Letter; Wellington Shields Letter at 3; BIO Letter at 4; CHX Letter at 17; IMC Letter at 1; and Nasdaq Letter at 4.

[171] *See* Wellington Shields Letter at 5; CHX Letter at 17; and IMC Letter at 2.

[172] *See* BIO Letter at 4.

[173] *See* Adorney Letter (''every time an order is executed away in a dark pool at the same price (or some cruel di minimis price like $15.997), it is 100% trading ahead of potential orders . . .'') and Vanguard Letter at 2.

[174] *See* Nasdaq Letter at 4.

[175] *See* Angel Letter at 10–11.

[176] *See* CHX Letter at 17 (expressing concern that ''if left unchecked migration could rise to a level where the price discovery mechanism provided by 'lit' venues could be compromised.''); IMC Letter at 2; Nasdaq Letter at 5; and NYSE Letter at 3 (acknowledging speculation that larger ticks could lead to more internalization and harm liquidity, but believes the outcome is uncertain and it is important for the data to decide).

[177] *See* CHX Letter at 17; IMC Letter at 2; and NYSE Letter at 3.

[178] *See* CMR Letter II at 6.

[179] *See* CMR Letter a 6; BATS Letter at 5 (stating that use of protected quotes at the NBBO properly balances the goal of rewarding those who set lit prices while also preserving trading center competition); and Citigroup Letter at 2.

[180] *See* CFA Institute Letter 3 and CHX Letter at 18 (stating the protected quotation standard ''supports price discovery'' and is analogous to Rule 611 of Regulation NMS that would make it ''simple to understand and implement'').

[181] *See* FIF Letter at 3 (requesting clarification on what quotes would be subject to the Trade-At Prohibition—protected quotations or NBBO) and Bloomberg Letter at 21 (inquiring whether a matching engine could use the protected quotation standard for routing while using the NBBO standard for matching).

[182] *See* CHX Letter at 18.

[183] *See* Tabb Letter at 5; CMR Letter II at 6; STA Letter II at 10; KCG Letter at 15 (stating that the Size Limitation is beyond the scope of the Commission's June 2014 Order); BATS Letter at 5–6; SIFMA Letter II at 7; Citigroup Letter at 2; BlackRock Letter at 3; Bloomberg Letter at 13; CHX Letter at 19; Citadel Letter II at 7; and NYSE Letter at 3.

[184] *See* STA Letter II at 10 (noting that the change in execution logic is highly complex and recommends that hidden orders be provided an exemption to satisfy incoming orders); SIFMA Letter II at 7 (stating that broker-dealers should be allowed to internalize order flow without a limitation on size if they are displaying a quote at the price of the NBB or NBO and execution quality of large orders primarily from institutions could be harmed); Bloomberg Letter at 13 (expressing lack of support for trading with all display before trading with reserve); and Citadel Letter II at 7 (noting that there is substantial un-displayed liquidity at exchanges through iceberg orders and other non-displayed orders, and tapping this additional liquidity is very important to institutional and retail investors).

[185] *See* Tabb Letter at 5 (noting that execution certainty would be reduced); CMR Letter II at 6 (noting that information leakage risk would increase as investors with large orders would have to simultaneously execute against the BBO at multiple venues, thereby exposing the orders to significant signaling risk and market impact); BATS Letter at 5–6 (noting that not allowing execution of non-displayed order at a price equal to a protected quotation may disincent trading centers from quoting in the lit markets); SIFMA Letter II at 7 (stating that broker-dealers should be allowed to internalize order flow without a limitation on size if they are displaying a quote at the price of the NBB or NBO and execution quality of large orders

Continued

Other commenters were concerned that the Size Limitation would add implementation complexity, among other things, due to additional routing obligations.[186] Two commenters supported the Size Limitation arguing that without it the Trade-At Prohibition would do very little to promote displayed liquidity.[187]

d. Venue Limitation

Commenters generally opposed the Venue Limitation because it would restrict market makers' execution of incoming orders to lit exchanges.[188] Commenters opined that the Venue Limitation offered little, if any, market quality enhancement, and was anti-competitive.[189] One commenter stated; ''[T]here is no real benefit to price discovery and no real benefit to the displayed order; therefore, there is no incentive for market participants to display additional liquidity. It is simply a way to subsidize the for-profit exchanges by forcing more orders to be routed to them.'' [190] Two of the Participants, however, asserted that the Venue Limitation was an analog to the Size Limitation and is necessary to gauge the market impact of wider tick sizes.[191]

e. Block Size Orders

Several commenters suggested that the Block Size definition be altered to more accurately reflect block size transactions of small capitalization securities.[192] Two commenters recommended that the Block Size exception should be included in all Test Groups to help maintain institutional trading in Pilot Securities,[193] while another commenter stated that block trades should have the same execution increments as Retail Investor Orders.[194]

f. Other Test Group Three Exceptions

Seven commenters, while supporting the Trade-At Prohibition, recommended that its exceptions be modified.[195] Two commenters opined that the Trade-At Prohibition should not contain exceptions similar to Rule 611 of Regulation NMS because the Trade-At Prohibition would then replicate the complexity of Regulation NMS.[196] Other commenters opined that the Retail Investor Order exception should be modified or eliminated.[197] One commenter stated that the fractional shares exception to the Trade-At Prohibition was reasonable because fractional shares cannot be displayed and this exception would have a minimal effect on the market.[198]

g. Odd Lots

Finally, several commenters made suggestions regarding odd lots. One commenter suggested that odd lots should be subject to the Trade-At Prohibition because current trading practices create a large number of odd lot trades that would circumvent the Tick Size Pilot.[199] Another commenter, however, suggested that odd lot orders be excepted from the Trade-At Prohibition, as odd lots historically are often excluded from regulatory requirements.[200] One commenter requested clarity on the treatment of odd lots.[201]

E. Collection and Assessment of Tick Size Pilot Data

1. Trading Center Data

Several commenters stated that the Tick Size Pilot should leverage existing reporting requirements to ease the implementation burden.[202] Commenters suggested that existing data, such as data available through MIDAS,[203] Rule

primarily from institutions could be harmed); and BlackRock Letter at 3 (stating that the Size Limitation creates excessive delay in execution and sub-optimally broadcasts order flow in illiquid names to multiple venues when there might have been sufficient reserve or non-displayed interest to accommodate the order).

186 *See* CMR Letter II at 6; STA Letter II at 10 (noting that the change in execution logic is highly complex and recommends that hidden orders be provided an exemption to satisfy incoming orders); Citigroup Letter at 2 (noting that the Size Limitation and Venue Limitation are more onerous than any version of trade-at and there is no real benefit to price discovery and to displayed order); and BlackRock Letter at 3.

187 *See* CHX Letter at 19 (stating that without the Size Limitation, the Trade-At Prohibition would do little if anything to promote displayed liquidity and that it would reinforce the price discovery mechanism) and NYSE Letter at 3.

188 *See* CMR Letter II at 7 (noting that the Venue Limitation would increase message traffic between exchanges and other trading centers, which may cause additional failures of systems); KCG Letter at 16; SIFMA Letter II at 7 (stating that broker-dealers should be allowed to internalize order flow without a limitation on size if they are displaying a quote at the price of the NBB or NBO); Citigroup Letter at 2; Citadel Letter II at 7; and OTC Markets Letter at 8.

189 *See* KCG Letter at 16 (stating that the Venue Limitation is beyond the scope of the Commission's June 2014 Order and ''anti-competitive on its face''); Citigroup Letter at 2 (noting that the Size Limitation and Venue Limitation are more onerous than any version of trade-at and there is no real benefit to price discovery and to displayed order); Citadel Letter II at 7 (stating that market makers should not be forced to route all of their orders to the exchanges who would then reap the full benefit of their unnecessarily high, but permitted, ''take'' fees); and OTC Markets Letter at 8 (stating that the Venue Limitation violates the most basic principles of competition and capitalism, under which a variety of venues should be able to compete to offer the best package of price and services to investors).

190 *See* Citigroup Letter at 2.

191 *See* CHX Letter at 20 (stating that the Venue Limitation is necessary for the same reason as the Size Limitation) and NYSE Letter at 3 (supporting the Venue Limitation to protect displayed quotes, strengthen the incentive for market makers to quote aggressively, and allow the ability to analyze the impact of a protected quote requirement on a wider tick size).

192 *See* SIFMA Letter II at 7 (stating that the block size definition should be decreased); BlackRock Letter at 3–4 (noting that ''[n]early a third of equities eligible for the [Tick] [P]ilot have average daily trading volumes which are lower than 50,000 shares. A block of 10,000 shares would be incommensurate with the volume profile for these stocks as it represents a substantial percentage of the daily trading volume.''); and Fidelity Letter at 7.

193 *See* JonesTrading Letter at 2 (asserting that the Negotiated Trade Exception should also apply to al Test Groups to preserve institutional anonymity) and Citadel Letter II at 8 (advocating for the exemption to preserve executive quality).

194 *See* Liquidnet Letter at 2 (noting that block execution is important to institutional investors and that block orders should be allowed to execute at half-penny increments).

195 *See* Themis Letter at 4–5; CFA Letter; CFA Institute Letter; Bright Trading Letter; IMC Letter; Birch Bay Letter; and NYSE Letter (supporting certain limited exceptions to the Trade-At Prohibition in circumstances where the end customer is benefited by the exception). *See also* IssuWorks Letter at 5 (while not expressing support or opposition to the Trade-At Prohibition, the commenter suggested that odd-lot trades should be subject to the Trade-At Prohibition). *But see* CHX Letter at 18 (supporting the exceptions as proposed).

196 *See* Themis Letter at 4–5 and CFA Letter at 5–6 (arguing that the exceptions should be eliminated and the price improvement for retail investors should be increased). *But see* FIF Letter at 3 (while not expressing support or opposition to the Trade-At Prohibition, the commenter stated that it approved of mirroring the Regulation NMS exceptions).

197 *See* CFA Letter at 5; CFA Institute Letter at 5–6 (objecting to the retail price improvement amount as not sufficient to prevent market participants from stepping in front of displayed limit orders); Bright Trading Letter at 2 (objecting strongly to the retail exception because retail order flow would be more valuable on the exchanges); IMC Letter at 2 (noting that $0.005 hardly qualifies as meaningful price improvement and recommends at least half of the applicable tick); and Birch Bay Letter at 1 (believing that price improvement should be the full five cent tick increment for retail orders).

198 *See* CHX Letter at 20.

199 *See* IssuWorks Letter at 5 (citing O'Hara, Yao, and Ye paper, *What's Not There, The Odd-Lot Bias in TAQ Data,* that asserted 19% of trades are missing from the consolidated tape).

200 *See* SIFMA Letter at 9 (asserting that larger orders divided up to create odd lots should not qualify for the exemption).

201 *See* BATS Letter at 6.

202 *See* CoreOne Letter at 6; STA Letter II at 3 (recommending a widely used quantitative market metrics to measure improvements and degradations in overall liquidity available); FIF Letter 3–4; SIFMA Letter II at 8; STANY Letter at 8–9; Nasdaq Letter at 6–7; and NYSE Letter at 2–3.

203 Market Information Data and Analytics System (''MIDAS'') collects and processes data from the consolidated tapes as well as from separate proprietary feeds made individually available by each equity exchange. *See http://www.sec.gov/marketstructure/midas.html.*

605,[204] the SIPs,[205] and OATS,[206] could be used to lessen the burden of collection.[207] One commenter stated the collected data should focus only on data that allows for centralized comparisons and analysis.[208] This commenter also suggested that only data relevant to increased liquidity of Pilot Securities should be collected.[209] Some commenters believed certain additional data metrics should be included to better facilitate the assessment of the Tick Size Pilot.[210]

Several commenters supported the public availability of data for potential analysis by academics and other interested parties.[211]

2. Market Maker Profitability Data

Thirteen commenters discussed whether the Market Maker Profitability Data should be collected.[212] Ten commenters opposed collecting the Market Maker Profitability Data [213] because they believe gathering such data would be costly.[214] One commenter noted that profitability information is highly confidential and proprietary.[215] This commenter stated that profitability information is not currently disclosed except in a public company context, and requiring market makers to disclose their profitability to competitors (*i.e.,* the exchanges) is anti-competitive. This commenter posited that market makers may opt-out of trading in Pilot Securities rather than disclose the profitability information.

Additionally, two commenters stated that Market Maker Profitability Data is difficult to calculate and attribute to a specific activity.[216] Other commenters argued that the Market Maker Profitability Data is not necessary or useful to the goals of the Tick Size Pilot and therefore should not be collected.[217] Some commenters suggested that this data element was unnecessary and would provide the Participants with a competitive insight and advantage on market maker operations.[218]

Three commenters supported the collection of the Market Maker Profitability Data.[219] One commenter stated that the collection of this data would help to identify the effect of the Tick Size Pilot on market maker business practices.[220] Another commenter stated that Market Maker Profitability Data has analytical value for the Tick Size Pilot and indicated that the dissemination of the data on an aggregated basis would alleviate confidentiality concerns.[221]

One commenter stated the collection of the Market Maker Profitability Data should only be done if it is absolutely necessary for the Tick Size Pilot and, if so, then it should also be collected from ATSs and exchanges.[222] As a potential alternative to Market Maker Profitability Data, one commenter suggested the use of a ''Market Maker/Investment Bank'' scorecard that includes metrics or important drivers of liquidity.[223]

Two commenters expressed concerns related to the confidentiality of Market Maker Profitability Data because of the potential for such data to be reverse engineered and attributed to specific market participants after becoming publicly available.[224]

3. Assessment of Tick Size Pilot Data

Many commenters stated that the NMS plan should clearly define what would constitute a successful Tick Size Pilot and warrant implementation on a permanent basis.[225] Some commenters stated that it is important to quantify, within the metrics, specific data ranges that would be considered successful.[226] Another commenter noted that ''liquidity'' should be defined in order to facilitate the assessment of the Tick Size Pilot's impact on liquidity.[227]

Other commenters suggested specific data that would indicate the Tick Size Pilot's success or failure.[228] One

[204] Rule 605, Disclosure of Order Execution Information (''Rule 605'') is a trading center monthly reporting requirement regarding covered orders in NMS stocks. *See* 17 CFR 242.605.

[205] Securities Information Processor (''SIP'') is any person engaged in the business of collecting, processing, or preparing for distribution information with respect to transactions or quotations. *See* 15 U.S.C. 78c(22).

[206] *See supra* note 145 and accompanying text.

[207] *See* CoreOne Letter at 6; STA Letter II at 4 (advocating for additional categories of data that can be obtained through MIDAS); SIFMA Letter II at 8; STANY Letter at 8–9; CHX Letter at 2; Nasdaq Letter at 6–7; and NYSE Letter at 2–3.

[208] *See* FIF Letter at 3.

[209] *See* FIF Letter at 3–4 (suggesting sixteen specific data requirements that would be relevant to assessing liquidity).

[210] *See* Bloomberg Letter at 17 (suggesting the NMS plan data include order type usage statistics, off-exchange trading information, and research coverage metrics); Weaver Letter at 2 (requiring brokers to report the number of shares internalized). *See also IAC Recommendations.*

[211] *See* BIO Letter at 4 (stating an interest in reviewing the Tick Size Pilot results on an industry-by-industry basis); CFA Institute Letter at 6 (asserting that ''[p]ublic release ensures accountability and peer review of the data by enabling independent researchers to look for unique and potentially valuable bits of information within the data.''); Bloomberg Letter at 17; and KOR Letter II at 5–6 (urging the Commission to provide free and open access to Tick Size Pilot data to ensure broadened analysis from varied perspectives). Two commenters suggested that the data should be available in a downloadable format. *See* CFA Letter at 6; and FIF Letter at 2.

[212] *See* Duffy Letter at 2; CoreOne Letter at 2 (noting that it is going to be very difficult to measure the impact on research coverage from market maker profitability); STA Letter II at 10; KCG Letter at 18; CFA Letter at 7; SIFMA Letter II at 9; Citigroup Letter at 4–5; FIF Letter at 5–6; STANY Letter at 8; TD Ameritrade Letter at 5; Angel Letter at 8; CHX Letter at 21–22; and NYSE Letter at 2.

[213] *See* Duffy Letter at 2; STA Letter II at 10; KCG Letter at 18; SIFMA Letter II at 9; Citigroup Letter at 4–5; FIF Letter at 5–6; STANY Letter at 8; TD Ameritrade Letter at 5; CHX Letter at 21–22; and NYSE Letter at 2.

[214] *See* SIFMA Letter II at 8 (arguing the collection of market maker profitability unnecessarily increases the burden on market makers) and FIF Letter at 5–6 (asserting that the collection of market maker profitability would involve significant implementation). *See also* STANY Letter at 8 and NYSE Letter at 2 (stating eliminating the collection of market maker profitability would reduce the cost of the Tick Size Pilot).

[215] *See* STANY Letter at 8.

[216] *See* Citigroup Letter at 4 (arguing it is not feasible, nor accurate, to measure market maker profitability on a symbol-by-symbol basis) and FIF Letter at 6 (calculating profit includes access fees and rebates that are computed monthly and not on a trade-by-trade basis at the time of execution).

[217] *See* STA Letter II at 10; KCG Letter at 18; TD Ameritrade Letter at 5; and CHX Letter at 27. *See also* CoreOne Letter at 2 (asserting the correlation between market maker profitability and research would be difficult to determine).

[218] *See* KCG Letter at 18 (stating that ''[e]xchanges compete directly with market makers for order flow and should not collect, review and interpret their competitors' profitability data'' and it would also place market makers at a disadvantage when negotiating for services provided by exchanges); Citigroup Letter at 5 (arguing that market maker profitability should not be published to a primary competitor); and STANY Letter at 8 (asserting that the collection of market maker profitability is ''anti-competitive and extremely disadvantageous to market makers'').

[219] *See* CFA Letter at 6–7; CFA Institute Letter at 6; and Angel Letter at 8.

[220] *See* CFA Letter at 6–7.

[221] *See* Angel Letter at 8.

[222] *See* TD Ameritrade at 5.

[223] *See* Fidelity Letter at 8.

[224] *See* FIF Letter at 4 and STANY Letter at 8.

[225] *See* ECFTF Letter at 3; CMR Letter II at 2; STA Letter II at 2; KCG Letter at 7; BATS Letter at 6; BlackRock Letter at 6; Schwab Letter at 10; STANY Letter at 4–5; Fidelity Letter at 5–6; and TD Ameritrade Letter at 5.

[226] *See* STA Letter II at 2 (stating the Tick Size Pilot's goals should be prioritized from the onset in the event a conflict among the specific goals developed.); KCG Letter at 8 (arguing that ''the 200+ data collection items are susceptible to post-[Tick Size Pilot] use to build a story of ''success'' based on whatever criteria a given reviewer decides at that time''); BATS Letter at 6; BlackRock Letter at 6 (asserting that due to the associated costs of the Tick Size Pilot ''criteria for success should also be unambiguous''); Schwab Letter at 10; STANY Letter at 4–5 (stating that without a clear metrics to determine success ''[e]ach of the various business models will be able to lay a credible claim to success.''); and Fidelity Letter at 5 (asserting that success metrics need to be clearly defined from the onset ''to avoid post hoc justifications and arguments about success and failure.'').

[227] *See* Warner-Toomey Letter at 2.

[228] *See* ModernNetworks Letter at 2 (stating increasing the number of committed market-makers, more market participants, larger trade sizes and deeper displayed buy-sell interest should determine the success of the Tick Size Pilot); Tabb Letter at 2 (providing six metrics that indicate success: market efficiency, greater liquidity, larger

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commenter, focused on issuers of small capitalization securities, stated that capital formation criteria should be used to gauge the success of the Tick Size Pilot.[229] Another commenter, however, was concerned that the Tick Size Pilot would be prejudged if success metrics were defined before empirical data was gathered.[230]

Three commenters stated that the Tick Size Pilot data should be analyzed on a more frequent periodic basis until the final assessment is conducted.[231]

F. Use of an NMS Plan

Fourteen commenters indicated that the Tick Size Pilot should not be the subject of an NMS plan, but instead should be presented as, and adhere to the procedural requirements of, a formal Commission rulemaking that includes additional cost-benefit analysis.[232] Some commenters believed that the Tick Size Pilot is a market structure initiative that is too significant and impactful to be delegated to the Participants through an NMS plan.[233] A number of commenters questioned whether it was appropriate to have Participants formulate an NMS plan that would affect their competitors.[234] Commenters were also concerned that not all affected market participants, such as market makers, broker-dealers, and institutional investors, were included in the process of establishing the terms of the Tick Size Pilot and the NMS plan.[235] Additionally, some commenters intimated that a conflict of interest may exist by highlighting that the Participants who devised the NMS plan are now for-profit entities.[236]

G. Issuer Participation

A few commenters suggested that Pilot Security issuers should have discretion to set their own minimum increments.[237] One commenter stated that companies should be empowered to determine their increments by contract with market makers.[238] Another commenter stated there should be an ''Issuer Committee'' formed to advocate for the interests of issuers in the process.[239] Another commenter suggested the formation of a ''Tick Size Pilot Advisory Committee'' that would be able to provide input after the completion of the Tick Size Pilot comment period.[240]

Three commenters favored allowing issuers of Pilot Securities to opt-out of participating in the Tick Size Pilot.[241] One commenter stated that the decision to participate in the Tick Size Pilot should be determined by the Board of Directors or current shareholders of the company.[242] Three commenters opposed the idea of allowing a Pilot Security issuer to opt-out of the Tick Size Pilot because it could skew the data.[243]

H. Implementation of Tick Size Pilot

Several commenters offered suggestions on how the Tick Size Pilot should be implemented. Two commenters suggested that the implementation period should be at least one-year, but could be reduced if the Tick Size Pilot was simplified.[244] One commenter indicated that in order to adequately assess the burden and time necessary to implement the Tick Size Pilot, the requirements needed to be finalized prior to developing an implementation schedule.[245] Other commenters stated that either the Commission, or the Participants, should release detailed frequently-asked-questions to assist implementation of the Tick Size Pilot to help alleviate confusion.[246] One commenter requested that the list of securities be finalized prior to determining the implementation schedule.[247]

V. Discussion and Commission Findings

In 1975, Congress directed the Commission, through the enactment of Section 11A of the Act,[248] to facilitate the establishment of a national market system to link together the individual markets that trade securities. Congress found the development of a national market system to be in the public interest and appropriate for the protection of investors and the maintenance of fair and orderly markets to assure fair competition among brokers and dealers, among exchange markets, and between exchange markets and markets other than exchange markets.[249] Section 11A(a)(3)(B) of the Act authorizes the Commission, ''by rule or order, to authorize or require self-regulatory organizations to act jointly with respect to matters as to which they share authority under this title in planning, developing, operating, or regulating a national market system (or a subsystem thereof) or one or more facilities.'' [250] Rule 608 under Regulation NMS provides that the Commission's approval of a NMS plan is required to be based upon a finding that the plan is ''necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect

transaction size, increased certainty of execution, less off-exchange activity and greater price discovery, more market-making firms other than high-frequency firms); ECFTF Letter at 3 (indicating that Tick Size Pilot success should be determined by increase in relative level of trading liquidity, increase in change of institutional ownership, higher rate of equity capital issuance); and STA Letter II at 3–4. *See also* IAC Recommendations.

[229] *See* ECFTF Letter at 3 (advocating for using higher rate of equity capital issuance as a metric for success).

[230] *See* Nasdaq Letter at 4.

[231] *See* FIF Letter at 6; KOR Letter II at 3; and CHX Letter at 6. *See also* STANY Letter at 9 (requesting the Tick Size Pilot continue while its final assessment is conducted to avoid unnecessary costs, potential confusion, and greater risks of system errors).

[232] *See* Duffy Letter at 2; KCG Letter at 8–9; SIFMA Letter II at 7; MFA Letter II at 8; Wells Fargo Letter at 3; Citigroup Letter at 5; Schwab Letter at 8–9; STANY Letter at 9–10; Bloomberg Letter at 21–22; TD Ameritrade Letter at 4; ITG Letter at 4; Citadel Letter II at 3–4; Nasdaq Letter at 7; and OTC Markets Letter at 9.

[233] *See* Schwab Letter at Letter 8–9; Bloomberg Letter at 22 (stating the Commission should not defer to Participants for such major policy decisions); ITG Letter at 4 (opining that the Tick Size Pilot would modify certain obligations under Regulation NMS, and that NMS plans should implement the Commission's policy directives but not amend existing regulations established under federal securities laws); and Citadel Letter II at 3 (asserting that the temporary nature of a significant pilot should not exempt it from traditional rulemaking).

[234] *See* SIFMA Letter II at 2–3 (asserting the NMS plan benefits Participants more than others); TD Ameritrade Letter at 4 (stating the NMS plan unfairly gives more control of the Tick Size Pilot to one set of market participants over others); ITG Letter at 4 (stating that the SROs devising the NMS plan have potential conflicts of interests with ATSs and market makers); and Citadel Letter II at 4 (claiming that exchanges are able implement an NMS plan while excluding broker-dealers, issuers, investment funds, and the general investing public from the process).

[235] *See* Schwab Letter at 7 (asserting that ''it is unacceptable for exchanges to design the [NMS] [p]lan without any input from other parts of the industry.''); TD Ameritrade Letter at 4; and Citadel Letter II at 4.

[236] *See* KCG Letter at 8–9; Schwab Letter at 7; TD Ameritrade Letter 1; and Citadel Letter II at 5.

[237] *See* Bloomberg Letter at 16 and Angel Letter at 4.

[238] *See* Bloomberg Letter at 16 (citing certain European markets that allow for issuers to contract with market makers to determine the spread).

[239] *See* ModernNetworks Letter at 2.

[240] *See* NYSE Letter at 3.

[241] *See* DFA Letter at 3; Themis Letter at 2; and CCMC Letter II at 3.

[242] *See* DFA Letter at 3.

[243] *See* STA Letter II at 9; ICI Letter at 4; and CHX Letter at 9 (stating that an opt-out provision should be allowed only if there is also an opt-in provision; but either would be premature without data). *See also* IAC Recommendations.

[244] *See* SIFMA Letter II at 10 (citing the rollout period required for other Commission actions and indicating that if the Trade-At Prohibition is removed a shorter time would be sufficient) and FIF Letter at 6 (asserting a twenty month implementation would be necessary for the current NMS plan, but if it was simplified only a twelve month period would be necessary).

[245] *See* CHX Letter at 1.

[246] *See* KCG Letter at 17; Liquidnet Letter at 2; and Bloomberg Letter at 20.

[247] *See* Bloomberg Letter at 20.

[248] 15 U.S.C. 78k–1.

[249] 15 U.S.C. 78k–1(a)(1)(C)(ii).

[250] 15 U.S.C. 78k–1(a)(3)(B).

the mechanism of, a national market system, or otherwise in furtherance of the purposes of the Act.'' [251] Further, Rule 608 provides the Commission with the authority to approve a NMS plan, ''with such changes or subject to such conditions as the Commission may deem necessary or appropriate.'' [252]

While the Commission has reviewed certain aspects of decimalization and tick sizes over the years, the Commission has not tested whether a wider tick size for small capitalization stocks improves the market quality for these stocks.[253] As noted above, the JOBS Act directed the Commission to conduct a study, which resulted in the Decimalization Report. The Decimalization Report further recommended a public roundtable, which in turn produced broad support among its panelists for a pilot program. Since issuing the June 2014 Order, the Commission has received 77 comment letters that relate to, among other things, the development, costs, and complexity of the Tick Size Pilot, and the Commission has carefully considered the comments and the issues raised. The Commission has conducted significant analysis relating to the development, costs, and complexity of the Tick Size Pilot. As noted in the June 2014 Order and reflected in several comment letters,[254] it has been suggested that the minimum one penny tick size has had a detrimental impact on incentives for underwriters to pursue public offerings of smaller capitalization stocks, the production of sell-side research, and the incentives for broker-dealers to make markets in the securities of smaller capitalization companies. The Commission believes that it is in the public interest to gather objective evidence on the impact of the minimum tick size, and study a minimum of $0.05 tick size, on the trading, liquidity and market quality of securities of smaller capitalization companies.

The Commission believes that the Tick Size Pilot set forth in the NMS plan is reasonably designed to provide measurable data that should facilitate the ability of the Commission, the public, and market participants to review and analyze the effect of tick size on the trading, liquidity, and market quality of securities of smaller capitalization companies. The Tick Size Pilot should provide a data-driven approach to evaluate whether certain changes to the market structure for Pilot Securities would be consistent with the Commission's mission to protect investors, maintain fair, orderly and efficient markets and facilitate capital formation.

As described in detail below, the Commission, consistent with Rule 608, is modifying certain aspects of the NMS plan and the Tick Size Pilot. Specifically, the Commission is making the following changes to the NMS plan: (1) Extending the Pilot Period to two years; (2) lowering the market capitalization threshold criteria for identifying Pilot Securities to $3 billion or less; (3) modifying the Trade-At Prohibition by: (i) Amending the definition of trade-at to clarify that the provision would only be operative during Regular Trading Hours; (ii) removing the Venue Limitation, and (iii) lowering the thresholds in the Block Size definition; (4) modifying the data elements related to Market Maker Profitability Data by: (i) Removing the data element that would have required realized trading profits to be calculated net of fees and rebates, and (ii) requiring further aggregation of the Market Maker Profitability Data made publically available; (5) requiring Participants to provide an assessment on the impact of the Tick Size Pilot on market maker profitability; and (6) modifying the time when Participants must submit their assessments to the Commission.

The Commission received comments on market structure issues other than the Tick Size Pilot, such as maker-taker fee structures, access fees, payment for order flow, high frequency trading, and subpenny quoting.[255] The Tick Size Pilot is a targeted, limited-term pilot that is directed at analyzing discrete issues related to a segment of the equity markets. While the Commission appreciates market participants' views and opinions on these matters, the Commission believes that there would be substantial additional costs and complexity if the Tick Size Pilot were expanded to address these additional issues, and that they are broader than what the Commission wants to study in connection with the Tick Size Pilot. Therefore, the Commission is not expanding the Tick Size Pilot to assess these other market structure issues.

A. Costs and Complexity of the Tick Size Pilot

The Commission received numerous comments related to the costs and complexity of implementing and complying with the Tick Size Pilot in general, and Test Group Three in particular.[256] Commenters also expressed concerns about the potential increased costs that might be incurred by market participants, investors, and issuers as a result of the wider minimum tick size mandated by the Tick Size Pilot.[257]

With respect to market participants, such as trading centers and routing brokers, commenters believed that those market participants would incur substantial costs to reprogram and/or implement and operate as brand new, their trading, order routing, compliance, and other systems to implement the Tick Size Pilot. Such reprogramming or new implementation of systems would also include additional testing and compliance costs. Concerns were particularly pronounced with respect to the costs and complexity of implementing Test Group Three and its Trade-At Prohibition and, as noted above, some commenters believed market participants might cease trading Test Group Three securities for the proposed one-year duration of the Tick Size Pilot rather than incur those implementation costs.[258] Other commenters expressed concerns that the complexity of the Tick Size Pilot would lead to increased operational risks for market participants and the market as a whole. One commenter believed that the Tick Size Pilot would impede its ability to trade efficiently in Pilot Securities.

The Tick Size Pilot, by design, is an objective, data-driven test intended to evaluate how a wider tick size would impact trading, liquidity, and market quality of securities of smaller capitalization companies. As noted above, the Commission cannot know in advance the full effects, whether positive or negative, of a wider tick size on the behavior of market participants in response to the Tick Size Pilot. While the effects of wider tick sizes for small capitalization stocks on trading, liquidity, and market quality are not clear, the Commission believes that the Tick Size Pilot will generate data to help

[251] 17 CFR 242.608(b)(2). *See also* 15 U.S.C. 78k–1(a).

[252] 17 CFR 242.608(b)(2).

[253] *See supra* note 56 and accompanying text. These commenters suggested that the Commission had already studied the impact of tick sizes. While the Commission staff did prepare the Decimalization Report, which summarized academic literature related to the impact of decimalization, the Commission has not studied the impact of wider ticks on small capitalization stocks. *See* Decimalization Report, *supra* note 14.

[254] *See* June 2014 Order, *supra* note 4. *See also* IssuWorks Letter at 2; ECFTF Letter at 1; BIO Letter at 2 (''The one-size-fits-all tick size imposed by decimalization has hampered small company growth since it was implemented in 2000.''); BlackRock Letter at 1; and CCMC Letter II at 2.

[255] *See supra* notes 67–70 and accompanying text.

[256] *See supra* Section IV.A. *See also infra* Section V.D.4. for the discussion on Test Group Three and the Trade-At Prohibition.

[257] *See supra* Section IV.A.

[258] For a full discussion of the change in the Pilot Period to two years to address these concerns, *see infra* Section V.B.

inform whether significant benefits, such as improved liquidity and market quality, could be realized by investors, issuers, and other market participants. The Tick Size Pilot will provide the Commission and interested parties with real-world data regarding the effects of wider tick sizes on trading, liquidity and market quality for small-capitalization companies, and this empirical data will inform analyses and may serve as a basis for potential future regulatory actions to, among other things, capture any benefits from wider tick sizes on a permanent basis. The Commission, therefore, believes that the potential magnitude of the benefits that could be revealed by the Tick Size Pilot justify the costs of the Tick Size Pilot.

The Commission acknowledges that implementation of the Tick Size Pilot would create costs for market participants and potential operational risks. The Commission has taken seriously the concerns about costs, complexity, and operational risks, and has tried to carefully balance those concerns with the objectives and goals of the Tick Size Pilot. As a result, in response to comments, the Commission has decided to exercise its authority under Rule 608(b)(2) [259] to modify the Tick Size Pilot, as described below and elsewhere in this order. As noted by a one commenter, ''[a]ny systems change, no matter how thoroughly prepared and tested, creates a risk of error and negative impact to the market.'' [260] The Commission acknowledges that implementation of the Tick Size Pilot may involve operational risks, but believes that the Tick Size Pilot's design will permit market participants to leverage the use of existing compliance systems, which have been tested and currently are in use, and that this should serve to mitigate operational risks. In addition, certain of the Commission modifications to the Tick Size Pilot will further align the Tick Size Pilot requirements with existing systems which should further mitigate operational risks. The Commission believes that these Tick Size Pilot modifications should lessen the costs, complexity, and operational risks of its implementation and compliance without impairing the quality and relevance of the data to be collected. The Commission also notes that it is approving a one-year implementation period, which should provide market participants with adequate time for the careful development and rigorous testing of their compliance systems for the Tick Size Pilot.

Trading centers (*i.e.,* exchanges, alternative trading systems, and market makers and other internalizing broker-dealers), as well as non-trading center broker-dealers that route orders for customers or themselves and certain institutional and other investors, would incur costs to implement and comply with the Tick Size Pilot. Market participants would need to modify systems to comply with the minimum $0.05 quoting and/or trading increment and applicable exceptions for all three Test Groups. While some systems changes would be required for the purposes of the Tick Size Pilot, market participants already have systems in place to comply with the existing minimum $0.01 quoting increment and applicable exemptions under Rule 612 of Regulation NMS.[261] Rule 612 (''Subpenny Rule'') prohibits trading centers, among other things, from accepting, ranking or displaying an order priced greater than $1.00 per share in an increment smaller than $0.01, absent an applicable exemption. Consequently, the Commission believes that compliance with the quoting restrictions of the Tick Size Pilot would be implemented in a manner similar to the Subpenny Rule, so that trading centers and other market participants would be able to leverage existing Subpenny Rule compliance systems by, for example, adjusting their parameters from $0.01 to $0.05 as applicable. Nonetheless, the costs to market centers to implement the Tick Size Pilot could be substantial.[262]

As noted above, many commenters expressed concerns about the costs and complexity of implementing and complying with Test Group Three, and the Commission acknowledges the particular complexity of implementing and complying with the Trade-At Prohibition.[263] Among other things, trading centers would need to monitor protected quotations on other trading centers and prevent an execution that would match the price of any such quotation unless the trading center itself was displaying a protected quotation at that price, and of at least that size, absent an applicable exception. While compliance with the Trade-At Prohibition would require systems changes by trading centers, the Commission believes that, as with the minimum quoting increment, trading centers should be able to leverage existing compliance systems when implementing this aspect of the Tick Size Pilot. Trading centers today already have systems in place to comply with the provisions of Rule 611 under Regulation NMS (''Trade-Through Rule'') [264] and applicable exceptions, which operates in a manner similar to the Trade-At Prohibition. In addition, as discussed below, the Trade-At Prohibition has been designed to closely parallel the operation of Rule 611 (*e.g.,* by using protected quotations as the compliance benchmark rather than the NBBO, by mirroring most of the Rule 611 exceptions into the Trade-At Prohibition, and, as modified by the Commission, by eliminating the Venue Limitation). Accordingly, the Commission believes that trading centers should be able to efficiently build upon their existing Rule 611 compliance systems, which today monitor protected quotations on other trading centers and prevent an execution at a price worse than such quotations absent an applicable exception, to comply with the Trade-At Prohibition. In addition, the Commission acknowledges that certain non-trading center broker-dealers that desire to control the routing of their orders today monitor protected quotations and use ''intermarket sweep orders'' to allow trading centers to rely on an exception from Rule 611. These broker-dealers also would need to make adjustments to their compliance systems if they desire to use the comparable intermarket sweep order exception to the Trade-At Prohibition but, as with trading centers, the Commission believes they should be able to efficiently leverage their existing Rule 611 compliance systems to do so. Because compliance with the Trade-At Prohibition would be implemented in a manner similar to compliance with Regulation NMS, and by leveraging those longstanding systems, the Commission does not believe that compliance with the Trade-At Prohibition would create material additional operational risks or materially reduce the efficiency of trading in Pilot Securities as market participants already are complying with Regulation NMS.

The Commission also acknowledges that trading centers would be required to produce specified data in connection with the Tick Size Pilot and there would

[259] 17 CFR 242.608(b)(2).

[260] *See* SIFMA Letter at 6.

[261] 17 CFR 242.612.

[262] *See* CHX Letter at 17 (Estimating that its potential implementation costs for all three Test Groups would be approximately $140,000, and suggesting that such costs for approximately 60 market centers could be in excess of $8.0 million). *See also supra* note84.

[263] *See supra* Section IV.A. *See also infra* Section V.D.4. for the discussion on Test Group Three and the Trade-At Prohibition.

[264] 17 CFR 242.611.

be some associated costs and burdens.[265] Among other things, trading centers would have to produce certain data on market quality, orders, and market maker participation, and market makers additionally would be required to produce certain profitability data. The Commission believes that trading centers should be able to leverage existing systems for collecting and reporting execution quality data under Rule 605 of Regulation NMS for certain of the data relating to market quality and order information.[266] With respect to producing Market Maker Profitability Data, the Commission notes that market makers may capture trading profit data for internal business purposes. As discussed further below, the Commission believes that the design of the Trading Center Data already mitigates concerns about confidentiality and has further modified the Market Maker Profitability Data requirements to address concerns regarding the confidentiality of that data.[267]

The Commission recognizes that trading centers and market makers would be required to incur some additional costs to produce the specific data called for by the Tick Size Pilot. In particular, the Commission recognizes that trading centers and market makers would need to make changes to their systems to compile the data and that transmitting the data would entail costs as well. However, as discussed below, the Trading Center Data and Market Maker Profitability Data are necessary to examine specific components of the Tick Size Pilot. As such, the Tick Size Pilot will provide the Commission and interested parties with real-world data regarding the effects of wider tick sizes on trading, liquidity, and market quality for securities of small capitalization companies, and this empirical data will inform analyses and potential future regulatory actions to, among other things, capture any benefits from wider tick sizes on a permanent basis.

As discussed below in Section V.E.2, the Commission is modifying certain aspects of the Tick Size Pilot to reduce the data production burdens and related concerns about the confidentiality thereof (*e.g.,* by eliminating the requirement for market makers to report realized trading profits net of fees and rebates, and by requiring Market Maker Profitability Data that is made publicly available to be further aggregated).[268] The Commission is not modifying the Trading Center Data to address confidentiality concerns. First, the order data and the market quality data would be available on a significant lag, mitigating potential risks about confidentiality. One concern is that order data and market quality data may reveal the trading intentions of market participants. However, this concern is mitigated if the data is disseminated with a significant lag because market participants may have completed their trades, rendering this information less sensitive. Second, the Commission does not believe that the order data would be sufficiently detailed to identify particular investors or their trading strategies. Further, current market quality data identifies the trading center producing the data, so any increases in risks regarding confidentiality are unlikely to be significant. The collection and analysis of relevant data, however, is the central purpose of the Tick Size Pilot. The effects of wider tick sizes for small capitalization stocks on trading, liquidity, and market quality are not clear and the Tick Size Pilot will provide data to allow the Commission to effectively test for the potential benefits and costs of permanently changed tick sizes. The Commission believes that the potential magnitude of the benefits that could be revealed by the Tick Size Pilot justify the costs of running the Tick Size Pilot.

Finally, the Commission acknowledges the concerns expressed by commenters about the potential increased costs that might be incurred by investors and issuers as a result of the wider minimum tick size mandated by the Tick Size Pilot.[269] As noted above, several commenters expressed concern that the Tick Size Pilot would help market professionals at the expense of investors. In fact, two commenters believed that the increased costs to investors could exceed $200 million per year. Other commenters expressed the view that the Tick Size Pilot could raise the cost of capital for issuers.[270] Other commenters suggested that an assessment of investor costs should be completed prior to the implementation of the Tick Size Pilot.

The Commission notes that the central purpose of the Tick Size Pilot is to assess the market quality impact of an increase in the tick size for the securities of smaller capitalization companies, which is comparable to assessing the impact of the Tick Size Pilot on investors. Notwithstanding the opinions of the commenters, whether an increased tick size would improve market quality, or increase or reduce execution costs for some or all investors, in some or all Pilot Securities, is not known at this time. As further discussed in Section V.C.1, the number of potential Pilot Securities that currently trade with a spread of greater than $0.05, and less than $0.05, is approximately equal. For Pilot Securities that currently trade with less than $0.05 spread, the costs for investors to trade smaller orders, typically placed by retail investors, at the quote may increase while the costs for investors to trade small orders in general may or may not increase, depending on the degree to which trades execute between the bid and the offer. The impact on larger orders, typically placed by institutional investors, however, is not clear. The impact on Pilot Securities that currently trade with a spread of greater than $0.05 similarly is not clear, as spreads in these securities may change as well depending on the impact of an increase in the tick size on market making incentives. The Commission notes that the exception for Retail Investor Orders was proposed by the Participants as a means to reduce the risk of the Tick Size Pilot having a detrimental impact on retail investor execution quality, and further, the Commission has made modifications to the proposal submitted by the Participants (*e.g.,* lowering the market capitalization threshold to exclude securities that tend to have narrower spreads and, with respect to the Trade-At Prohibition, removing the Venue Limitation[271] and liberalizing the Block Size definition).[272]

[265] *See, e.g.,* FIF Letter at 5–6; SIFMA Letter at 8 (''the data collections specified in Appendices B and C of the Proposed Plan are extremely burdensome on broker-dealers and should be eliminated . . . The proposed collections of order and profitability data unnecessarily increase the burden on all trading centers, especially market makers who would be subject to both Appendix B and C.''); Nasdaq Letter at 6; and Citadel Letter at 8.

[266] 17 CFR 242.605.

[267] *See infra* Section V.E.2.

[268] The Commission also notes that data production costs should also be reduced as a result of the modification of the market capitalization threshold which will reduce the universe of potential Pilot Securities. *See infra* Table 1 in Section V.C.1.

[269] *See supra* note 59 and accompanying text. *See also* IAC Recommendations (expressing concern that a pilot would disproportionately harm retail investors because their trading costs would rise). The Commission has carefully considered the IAC Recommendations from January 2014. After careful deliberation and considering the IAC Recommendations, the Commission is approving the NMS plan, as modified.

[270] *See supra* note 78 and accompanying text.

[271] The removal of the Venue Limitation should reduce the potential costs and complexity associated with the proposed Tick Size Pilot by not requiring liquidity that would have been affected by the Trade-At Prohibition to be routed from off exchange venues to lit venues. *See infra* Section V.D.4.d.

[272] The modification to liberalize the Block Size definition should serve to mitigate disruptions to

Continued

With respect to the specific cost estimates, the Commission appreciates the efforts of commenters to quantify costs and has carefully assessed the estimates. These estimates rely on historical trading data and reasonable assumptions on how retail execution quality may change with wider tick sizes. The Commission cannot know, however, the full impact of wider tick sizes on investors, before the Tick Size Pilot is underway. With the exception of the modifications and consideration for retail investors in the original design of the Tick Size Pilot, the Commission does not believe it can further reduce these costs without sacrificing the utility of the Tick Size Pilot. Specifically, the Commission would need to focus the Tick Size Pilot exclusively on stocks with higher transaction costs, which are determined by spreads. As noted in Section V.C.3. below, if the tick size mechanically affects a criterion for inclusion, then the Tick Size Pilot would be severely limited in its ability to inform any future rulemaking by the Commission. While the effects of wider tick sizes for small capitalization stocks on trading, liquidity, and market quality are not clear, the Commission believes that the Tick Size Pilot will generate data to help inform whether the significant benefits, such as improved liquidity and market quality, could be realized by investors, issuers, and other market participants. The Tick Size Pilot will provide the Commission and interested parties with real-world data regarding the effect of wider tick sizes on trading, liquidity, and market quality for small-capitalization companies and this empirical data will inform analyses and potential future regulatory actions to, among other things, capture any benefits from wider tick sizes on a permanent basis. The Commission, therefore, believes that the potential magnitude of the benefits that would be revealed by the Tick Size Pilot justify the costs of the Tick Size Pilot.

Similarly, while the Commission recognizes the potential connection between tick size, liquidity, and cost of capital, the impact of an increased tick size on the costs and ability of issuers to raise capital, if any, is not known at this time. As noted above, the Commission believes that altering tick sizes could result in significant market-wide benefits and improvements to capital formation. In particular, if a wider tick size leads to more active market making and attracts more investors to small capitalization stocks, positive effects on trading, liquidity, and market quality as measured by metrics such as trading volume, displayed depth, effective spreads, or execution costs for small and large trades could be observed. Indeed, some advocates for a tick size pilot argue that a wider tick size would benefit issuer's capital formation and cost of capital.[273] Nonetheless, the Commission recognizes that these benefits may not manifest in the manner or to the extent anticipated. Further, the Commission believes that the design of the Tick Size Pilot and the data in the Appendices will facilitate robust analyses to help assess the benefits and costs of wider tick sizes. Nevertheless, the Commission intends to carefully monitor implementation of the Tick Size Pilot and, should it appear that the protection of investors is compromised, the Tick Size Pilot can be modified or terminated early to protect them and integrity of the market.

Some commenters expressed the view that the Tick Size Pilot should have been implemented through Commission rulemaking that includes a cost-benefit analysis or that the Commission should have conducted a cost-benefit analysis as part of the NMS plan process. The Commission reasonably concluded that proceeding with the Tick Size Pilot through an NMS plan was an appropriate way to gather information necessary to assess whether changes should ultimately be made through rulemaking or otherwise. As discussed in detail in the June 2014 Order, and noted above, consideration of issues related to minimum tick sizes has been ongoing for years.[274] That history of study led the Commission to conclude that it could not adequately evaluate the need for additional regulatory action without empirical data that would be generated from a pilot implemented through an NMS plan. The Commission is modifying the NMS plan in response to comments, including comments with respect to the costs and benefits. Consideration of the potential costs and benefits of the Tick Size Pilot is reflected in the June 2014 Order, the Notice and this order which also addresses comments about the potential competitive impact and other economic consequences of the NMS plan.

The Commission's approval of the NMS plan is designed and intended to produce measurable data to study the impact of a wider tick size on the liquidity and trading in the securities of smaller capitalization companies, which should support an objective data-driven review of this important policy issue. Legitimate questions have been raised about the impact of decimalization on the market for small capitalization securities.[275] The Tick Size Pilot, as modified, should produce valuable data to allow the Commission, the public, and market participants to assess the impact of a wider tick size on the trading, liquidity, and market quality of smaller company stocks. Notwithstanding, the Commission would, and expects the Participants to, actively monitor the operation of the Tick Size Pilot[276] and, if necessary, the Tick Size Pilot can be modified or terminated early to ensure the protection of investors and integrity of the market.

In addition, the Commission emphasizes that it welcomes the submission of additional comments and empirical evidence during the Pilot Period with respect to, among other things, the operation of the Tick Size Pilot, in particular the three Test Groups, and the costs associated therewith. The Commission would take such comments into account in its consideration of related future regulatory actions.

B. Tick Size Pilot Duration

As proposed, consistent with the June 2014 Order, the Pilot Period would be for one year. In the June 2014 Order, the Commission noted that it preliminarily believed that a one-year Pilot Period would be sufficient to generate data to reliably analyze the effects and impact of wider tick sizes. Several commenters argued that the Pilot Period should be longer than one-year.[277] Commenters suggested that the Tick Size Pilot would be too complex and costly to implement for a one-year Pilot Period, which could lead market participants to opt-out of quoting and trading in the Pilot Securities, especially in Test Group Three Pilot Securities.[278] As noted by several commenters, the one-year Pilot Period could lead some market participants to decide not to participate in the Tick Size Pilot.[279] For example, one commenter suggested that a one-year Pilot Period would not be ''enough time to warrant start-up costs and other

the institutional trading of securities with smaller market capitalization. *See infra* Section V.D.4.e.

[273] *See, e.g.,* BIO Letter at 5.

[274] *See supra* Section II. *See also* June 2014 Order, *supra* note 4 for a further discussion on the history of decimalization and tick sizes.

[275] *See supra* note 9 and accompanying text.

[276] *See* June 2014 Order, 79 FR at note 50, *supra* note 4. As noted in the June 2014 Order, during the Pilot Period, the Commission believes that Participants should notify the Commission if they detect any broadly negative impact of the Tick Size Pilot on market quality.

[277] *See supra* note 89 and accompanying text.

[278] *See supra* note 90 and accompanying text.

[279] *See supra* notes 95–96 and accompanying text.

investments to participate.'' [280] Another commenter suggested that a longer Pilot Period would ''provide a better incentive for investments that market participants will need to make in order to increase their exposure to the small cap[italization] market.'' [281] Some commenters suggested that a longer Pilot Period could also help justify its up-front implementation costs. Commenters noted that if market participants did not participate in the Tick Size Pilot, the reliability of the data could be compromised.

The Commission recognizes that there would be start-up costs and other investments associated with participating in the Tick Size Pilot, and does not want the Pilot Period to be a disincentive to participate. The Commission believes that extending the Pilot Period to two years would help address some of those concerns in part by having those costs spread out over a longer period. The Commission expects that a longer Pilot Period should encourage wider participation (or remove incentives to opt-out of participation) and therefore help make the data more reliable, richer, and useful. [282] Accordingly, after carefully considering the comments, the Commission is modifying the NMS plan by lengthening the Pilot Period from one-year to two-years.

The Commission does not think it is necessary to extend the Tick Size Pilot beyond two years. As noted above, several commenters suggested a Pilot Period longer than two years.[283] In the Order, the Commission noted its preliminary belief that a one-year period would generate sufficient data to reliably analyze the effects and impact of the wider tick size. The Commission continues to believe that meaningful data could be generated in a relatively short time period but believes that extending the Pilot Period for one additional year could encourage participation in the Tick Size Pilot, which further supports the goal of generating sufficient data. If a number of market participants decided to refrain from participating in the Tick Size Pilot, the ability to generate and collect data sufficient to study the impact of wider tick sizes would be frustrated. The Commission also notes that a longer Pilot Period should help to mitigate concerns that the data generated from the Tick Size Pilot could be susceptible to short term fluctuations as suggested by commenters. Therefore, the longer Pilot Period should also support representational faithfulness.[284] The Commission understands that some commenters supported the one-year Pilot Period.[285] However, the Commission believes that the longer Pilot Period is necessary for the reasons discussed above.

The Commission received comments on whether the Tick Size Pilot should cease at the end of the Pilot Period or continue to operate while the data are assessed.[286] As described below, the Participants will be required to submit their assessment 18 months after the start of the Tick Size Pilot, based on data generated during the first 12 months.[287] This timing is consistent with the timing set forth in the June 2014 Order,[288] but would provide the Commission and the public with valuable information about the Tick Size Pilot's impact during the Pilot Period. In addition, the Trading Center Data and Market Maker Profitability Data would be publically available during the Pilot Period, which would allow market participants and the public to conduct analysis during the Pilot Period.

The Commission, however, is only approving a Pilot Period of two years in this order. Any proposal to extend the Tick Size Pilot beyond the two-year term would be considered and evaluated at a later date. Therefore, the modification to the Pilot Period of the Tick Size Pilot, extending its duration to two-years, is appropriate.

C. Criteria for Pilot Securities

The Tick Size Pilot sets forth five criteria for determining which NMS common stocks would be included: (1) Market capitalization of $5 billion or less; (2) Closing Price of at least $2.00 on the last day of the Measurement Period; (3) Closing Price of at least $1.50 on every trading day during the Measurement Period; (4) CADV of one million shares or less; and (5) VWAP of at least $2.00.

1. Market Capitalization for Pilot Securities

Many commenters noted that the market capitalization threshold was too high and recommended that the threshold be lowered.[289] Commenters expressed views that the $5 billion market capitalization threshold would include many securities not considered as small capitalization stocks. Certain comments recommended that the market capitalization threshold be as low as $250 million to $2 billion. After carefully considering the comments and reviewing prior staff analysis,[290] the Commission deems it appropriate to change the NMS plan by lowering the market capitalization threshold for Pilot Securities from $5 billion or less to $3 billion or less. In the June 2014 Order, the Commission preliminary believed that a market capitalization of $5 billion or less would capture the securities of smaller and middle capitalization companies with low liquidity and trading activity, and would provide the Tick Size Pilot with a broad sample. However, in response to the comments received, the Commission staff reviewed its analysis of stocks from a period of July 1, 2013 to August 31, 2013,[291] and found that lowering the market capitalization threshold from $5 billion or less to $3 billion or less should ensure that there would be a sufficient sampling of stocks to support the analysis of the Tick Size Pilot, including as it relates to a variability in effective spreads, particularly effective spreads greater than 5 cents per share for Pilot Securities. Table 1 reflects staff's analysis.

[280] *See* Duffy Letter at 1. *See also* ABC letter at 3.

[281] *See* ABC Letter at 3.

[282] The Commission notes that market makers not trading in Pilot Securities would forgo the profits they could earn from trading in those securities. Those foregone potential profits would be larger over a longer time period. In addition, the larger potential profits that could be earned by market makers over the longer time period should help to offset any implementation and compliance costs associated with trading in the Pilot Securities.

[283] *See supra* Section IV.B.

[284] In this respect, the Commission notes that the costs of implementing the Tick Size Pilot should be justified not by a longer duration per se, but by the benefits that a longer Tick Size Pilot would bring in generating useful data that could guide potential future tick size rulemaking. The Commission notes that one commenter suggested that the proposed one-year time period would make the data easy to manipulate. *See* Duffy Letter at 1. As noted, the Commission believes that the longer Pilot Period should support data integrity.

[285] *See supra* Section IV.B.

[286] *See supra* notes 105–108.

[287] Therefore, the modification to the Pilot Period will not delay assessment of the Tick Size Pilot.

[288] The June 2014 Order and proposed NMS plan provided that Participants should submit their assessment six months after the end of the Tick Size Pilot, which would have been 18-months after the start of the Tick Size Pilot.

[289] *See supra* Section IV.C.1.

[290] *See* June 2014 Order, *supra* note 4.

[291] *See* June 2014 Order, *supra* note 4.

TABLE 1—EFFECTIVE SPREAD DISTRIBUTION [292]

Market capitalization categories	Number of stocks	Effective spreads (in cents)		Percent of stocks with effective spread >$0.05
		90th percentile	10th percentile	
Less than $1 billion	1,979	25.33	1.42	53.97
Less than $2 billion	2,376	23.10	1.43	50.04
Less than $3 billion	2,574	22.31	1.43	48.10
Less than $5 billion	2,758	21.93	1.43	46.63

Overall, Table 1 provides evidence that the selection of a market capitalization threshold involves trading-off potential sample size, which affects statistical power,[293] and the potential negative impact of the Tick Size Pilot on stocks with low current effective spreads. The analysis in Table 1 shows that no single threshold can produce a clear-cut sample of securities for the Tick Size Pilot. In particular, for each potential market capitalization threshold in the table, approximately 10% of stocks have effective spreads of 1.43¢ or less. Further, for stocks in the lower thresholds, more stocks have higher effective spreads. This shows that the range of effective spreads is greater for lower market capitalization stocks. However, the number of stocks in the potential sample declines with market capitalization as well. Table 1 also shows that lowering the market capitalization threshold from $5 billion or less to $3 billion or less would reduce the universe of potential Pilot Securities by only 184 stocks, which suggests that the threshold of $3 billion or less would restrict the Tick Size Pilot to smaller stocks while still assuring a sufficiently large sample.

Therefore, the Commission believes that it is necessary and appropriate to change the NMS plan by lowering the market capitalization threshold to $3 billion or less. The Commission notes that this change would result in fewer securities eligible to be included in the Tick Size Pilot, but this reduction should not materially impact the Tick Size Pilot's goal of generating useful data. Further, the lowered threshold should lessen the impact of the Tick Size Pilot on the overall market, in that stocks included in the Test Groups would be smaller and less liquid; and their combined trading volume as a proportion of the overall market volume would also be lowered.

Many commenters recommended lowering the market capitalization threshold to $1 billion or less (or to an even lower threshold).[294] However, Table 1 shows that further reducing the market capitalization threshold from $3 billion or less to $1 billion or less would reduce the number of Pilot Securities by additional 595 stocks. The Commission believes that such a reduction in market capitalization would result in a sample size that is too small (1,979 stocks, including the Control Group), significantly reducing the power of a statistical analysis of the Tick Size Pilot. Moreover, the threshold of $1 billion or less would limit the ability to assess the impact of the widened ticks on stocks with different market capitalizations and hence the utility of the Tick Size Pilot in assessing possible market capitalization thresholds for a potential future tick size rulemaking.[295]

2. Other Proposed Selection Criteria for Pilot Securities

The Commission received a few comments on the other proposed selection criteria.[296] For example, one commenter suggested that the volume threshold should range from 300,000 to 500,000 for illiquid shares. The Commission has considered these comments but does not believe it is necessary to modify the Tick Size Pilot any further in response. First, by having a floor of 300,000 shares, many small capitalization firms would be excluded from the Tick Size Pilot. Second, the upper threshold of 500,000 would reduce the sample size and limit the variation in stock characteristics in the Tick Size Pilot. The goal of the Tick Size Pilot is to study the effect of tick size on the liquidity and trading of small capitalization stocks. Therefore, the Commission believes that the universe of Pilot Securities should include a variety of stock characteristics in the sample to facilitate the ability to conduct fulsome assessments.

Other commenters suggested that the CADV be lowered or that it should be based on the dollar trading value or that it should be based relative to public float. The Commission has considered these comments but does not believe it is necessary to modify the Tick Size Pilot any further in response. In particular, it is widely known that these volume measures are highly correlated with each other and therefore would most likely produce similar samples of Pilot Securities. Further, share volume is less correlated with market capitalization than other volume measures, so it would add the most as a separate criterion.

3. Additional Criteria for Pilot Securities

Commenters also suggested additional criteria for selecting the Pilot Securities.[297] For example, several commenters suggested that the average weighted daily spread of five cents or greater should be a criterion because some securities with spreads less than five cents would not benefit from the Tick Size Pilot. After careful review, the Commission believes that the selection criteria as proposed in the NMS plan, and modified by the Commission, are appropriate. In particular, the Commission believes that the selection criteria should provide an appropriate number of securities to test while also minimizing potential concerns about costs to investors and issuers. Further, tick size does not mechanically affect the approved criteria set forth in the Tick Size Pilot, making it more informative for any potential future tick size rulemaking.

The Commission does not believe that a spread criterion should be included. Tick size mechanically affects alternative criteria such as bid-ask spreads and effective spreads, such that

[292] Data in this table covers common stocks with average price greater than $2 per share and average daily trading volume smaller or equal than one million shares during the period of July 1, 2013–August 31, 2013. Data comes from the NYSE's Trade and Quote Data.

[293] Statistical power is the ability to detect an effect, if the effect actually exists.

[294] *See supra* note 115 and accompanying text.

[295] Two commenters recommended lowering the market capitalization threshold to $2 billion or less *see supra* note 115 and accompanying text. That threshold would suffer from the same disadvantages as the threshold of $1 billion or less, although to a lesser extent. In particular, Table 1 shows that reducing the market capitalization threshold from $3 billion or less to $2 billion or less would reduce the number of Pilot Securities by additional 198 stocks. *See supra* Table 1 in Section V.C.1. The threshold of $2 billion or less would also limit the ability to assess the impact of the widened ticks on stocks with different market capitalizations.

[296] *See supra* Section IV.C.2.

[297] *See supra* Section IV.C.3.

using such criteria to determine Pilot Securities would make the Tick Size Pilot less informative on when the tick size in a stock should be smaller. In addition, researchers should be better positioned, without spread criteria that is set forth by the NMS plan, to use Tick Size Pilot data to independently suggest tick size criteria for securities with smaller capitalization.

4. Securities Excluded From the Tick Size Pilot

The Tick Size Pilot, as proposed, excludes securities that have had an IPO within six months of the start of the Pilot Period. Commenters expressed views on other securities that should be excluded from the Tick Size Pilot, including securities that are cross-listed in Canada and securities that trade below $1.00 per share during the Pilot Period. The Commission notes that securities that are cross-listed in Canada are included in other NMS provisions and plans; accordingly the Commission believes that such securities should also be included in the Tick Size Pilot. The Commission also notes that researchers may choose not to include all securities in the Test Groups when they undertake their analyses. In particular, researchers may choose not to include securities that are cross-listed with Canada if they think the results of their analyses may be significantly affected.

The Commission believes that the exclusion of securities that have participated in a recent IPO is necessary because such stocks would not have a full data set prior the start of the Tick Size Pilot, which would limit the ability of the Commission and the public to analyze the effects of the Tick Size Pilot against a sufficient baseline.

One commenter suggested that the NMS plan specifically eliminate Pilot Securities that trade at $1.00 or less during the Pilot Period. The Commission notes that the Participants proposed additional selection criteria to minimize the likelihood that securities that trade with a share price of $1.00 or less would be included in the Tick Size Pilot. Specifically, there are three criteria that seek to evaluate the share price of potential Pilot Securities: (1) a closing price of at least $2.00 on the last day of the Measurement Period; (2) a closing price on every U.S. trading day during the Measurement Period that is not less than $1.50; and (3) a Measurement Period VWAP of at least $2.00 per share. The Participants stated that these criteria were designed to avoid having securities priced $1.00 or less selected as Pilot Securities but the Participants state that Pilot Securities would not be excluded from the Tick Size Pilot if their share price falls to $1.00 or less during the Pilot Period. The commenter has not suggested that these criteria are not sufficient for this purpose but states that it is ''reasonable to expect a small number of Pilot Securities to trade below $1.00 during the Pilot.'' The Commission believes that once established, the universe of Pilot Securities should stay as consistent as possible so that the analysis and data can be accurate throughout the Pilot Period.

Finally, the Commission received a few comments supporting the exclusion of ETFs from the Tick Size Pilot. The Commission agrees that these securities should be excluded because their pricing is derivative of the value of their component securities.

5. Assignment of Pilot Securities

The NMS plan contains procedures for stratified random sampling in which the Participants would assign the Pilot Securities into 27 categories, and then randomly assign Pilot Securities into the Tick Size Pilot groups (Control Group and three Test Groups), based on the percentages of Pilot Securities in each category. The Commission did not receive comments with respect to this aspect of the NMS plan.

In the June 2014 Order, the Commission stated that the assignment of Pilot Securities into each test group should involve stratified sampling by market capitalization and price. The Participants proposed to add the CADV to the market capitalization and price. The Commission believes that the addition of CADV should ensure that each test group contains a representative of the total universe of Pilot Securities. Specifically, this should help ensure that the four groups of securities are comparable to each other in terms of stock characteristics and therefore should provide an ideal experimental setting for robust analysis of the Tick Size Pilot.[298]

D. Control Group and Test Groups

The Tick Size Pilot would have a Control Group and three Test Groups, comprised of 400 Pilot Securities per test group. Test Group One Pilot Securities would quote in $0.05 per share increments and would trade at any currently permitted increments. Test Group Two Pilot Securities would quote in $0.05 per share increments like those in Test Group One, but would only be permitted to trade in $0.05 per share increments, subject to three exceptions. Finally, Test Group Three Pilot Securities would quote in $0.05 per share increments and trade at $0.05 per share increments consistent with Test Group Two, and be subject to the Trade-At Prohibition. Pilot Securities in the Control Group would continue to quote and trade at the pricing increments that are currently permitted.

Several commenters opined about the design of the Tick Size Pilot. For example, some commenters suggested that the Tick Size Pilot should be narrower, with only one or two test groups which would lessen the cost and complexity of the Tick Size Pilot.[299] Other commenters supported the incremental design of the Tick Size Pilot.

The Commission notes that the NMS plan has been designed to incrementally assess potential changes to the Tick Size Pilot, such that Test Group One would only add a wider quoting increment, while Test Group Two would also add a wider trading increment, and finally Test Group Three would add the Trade-At Prohibition. The Commission believes that constructing the Tick Size Pilot in this manner should generate the most meaningful and measurable data that should allow the Commission and other interested parties to conduct studies.

Commenters also expressed their views that other tick sizes, both larger and smaller than the proposed $0.05 tick size increment, should be included and tested concurrently within the Tick Size Pilot.[300] In the June 2014 Order, the Commission stated its preliminary belief that $0.05 is an appropriate minimum increment, due to the significant percentage of Pilot Securities with a bid-ask spread of greater than $0.05. As noted above, the Commission modified and analyzed potential Pilot Securities based on the $3 billion market capitalization threshold, for a period of July 1, 2013 to August 31, 2013 and found that 48.1 percent of these securities had effective spreads greater than $0.05.[301] For these securities, the impact on costs to investors of an increase of the minimum price increment to $0.05 is not clear, as effective spreads in these securities may change as well depending on the impact of an increase in the tick size on market making incentives. For securities with effective spreads smaller than $0.05, the

[298] Ideally, researchers would want to have identical stocks in each group to isolate the effects of the different treatments in the four groups. However, because this is not possible, researchers employ techniques to make the stocks in the four groups as similar as possible. The SROs have proposed such a technique.

[299] *See supra* note 126 and accompanying text.

[300] *See supra* notes 129–131 and accompanying text.

[301] *See supra* Table 1 in Section V.C.1.

effective spread may or may not rise due to the increase in the minimum increment, depending on the degree to which trades execute between the bid and the offer. Increased effective spreads, holding everything else equal, would represent increased costs to investors. However, the Tick Size Pilot will be able to address whether the increased minimum increment will lead to more market maker participation and ultimately, to more liquidity in small capitalization stocks, which may counteract increased costs due to higher effective spreads. The Commission believes that the data supports the conclusion that, on balance, the $0.05 increment is appropriate for the Tick Size Pilot because it should mitigate cost increases to investors while supporting a robust test. While commenters suggested additional increments to test along with the $0.05 increment, the Commission believes that additional increments could increase the Tick Size Pilot's complexity by, for example, increasing the number of test groups in the Tick Size Pilot, which in turn would require more programming development and system changes by market participants.[302]

In the NMS plan, the Participants proposed 400 Pilot Securities per Test Group positing that the increased size of each Test Group would help to ensure a sufficient data yield for the completion of required assessments even in the event of the removal or exclusion of Pilot Securities. The Commission received three comments on this aspect of the Tick Size Pilot, two of which said the Test Groups should be smaller and one who thought 400 was appropriate.[303] The Commission believes 400 Pilot Securities per Test Group should be large enough to generate data to reliably test for the effects of larger tick size, and should make the Tick Size Pilot more resilient in the event of the unforeseen removal or exclusion of Pilot Securities. Therefore, the Commission believes that assigning 400 Pilot Securities to each Test Group is appropriate.

The Commission received a few other comments related to the operation of the Tick Size Pilot. Specifically, two commenters offered differing opinions with respect to whether the Tick Size Pilot should operate during opening and closing auctions.[304] The Commission notes that the NMS plan provides that the Tick Size Pilot would be operational during and outside of Regular Trading Hours, which is defined in the NMS plan as consistent with Rule 600(b)(64) of Regulation NMS.[305] If the Participants find that further clarification or modification is needed to address the opening and closing auctions, they may utilize the procedures set forth in Rule 608 to amend the NMS plan. However, the Commission notes that switching to penny increments during these auctions may cause additional complexity and would be different than how these auctions are currently run. Specifically, opening and closing auctions typically do not operate with increments different than the increments used during Regular Trading Hours.

In addition, two commenters requested clarification on how to handle orders that do not conform to the quoting increments.[306] The Commission notes that the Participants, as required under the NMS plan, would be required to adopt rules that are needed for compliance by the Participants and their members with the provisions of the Tick Size Pilot.[307] In addition, the Participants, as required under the NMS plan would be required to develop written policies and procedures that are reasonably designed to comply with the quoting and trading requirements of the Tick Size Pilot. Therefore, the Participants should ensure that they address issues and questions related to the operation of the Tick Size Pilot during the implementation period.

1. Control Group

The Pilot Securities in the Control Group would be quoted and traded in any increment currently permitted. Any Pilot Securities that are not selected to be included in a test group would be placed in the Control Group. The Commission believes that the Control Group should provide a baseline for the analysis of the effect of the Tick Size Pilot on liquidity and market quality data.

2. Test Group One: Widened Quote Increment

As discussed above, Pilot Securities in Test Group One would have a quoting increment restriction of $0.05 but could continue to trade at any currently permitted price increment. The Participants would be required to adopt rules that would prohibit the Participants or any member of a Participant from displaying, ranking, or accepting from any person any displayable or non-displayable bids or offers, orders, or indications of interest in increments other than $0.05. Orders priced to execute pegged to the midpoint of the NBBO and orders entered in a Participant's retail liquidity program could be quoted at less than the $0.05 increment. The Commission notes that Test Group One would be different from the Control Group in only one manner—the quoting increment would be widened.

Several commenters argued that Test Group One should be eliminated because trading for Test Group One Pilot Securities would migrate to non-displaying trading centers.[308] One commenter also suggested eliminating Test Group One to reduce the complexity of the Tick Size Pilot.[309] This commenter believed that eliminating Test Group One would reduce the costs of implementing the Tick Size Pilot and posited that ''there is little disagreement'' that Test Group One would divert order flow to unlit markets.[310]

The Commission, however, believes, as noted above, that Test Group One is necessary as an initial incremental change to test the impact of the Tick Size Pilot on market quality and liquidity of this market segment. The Commission believes that Test Group One is reasonably designed to generate data on how trading characteristics and liquidity would change if the quoting increment alone is widened. One commenter suggested that exchanges and agency ATSs would be at a competitive disadvantage vis-à-vis broker-owned proprietary execution systems which can execute orders at any increment without accepting or ranking an order at an impermissible increment. This commenter recommended that market participants be permitted to accept and rank, but not display, orders in one penny increments for Test Group

[302] While additional increments would provide additional data and would allow for additional tests, the Commission believes that the Tick Size Pilot with one increment will allow for a comprehensive analysis of the effects of an increased tick size and the added complexity would not be justified. In addition, the added complexity of additional increments may not only make analyses more complicated, but rather may even reduce the statistical power of such analyses and increase the operational risk of implementing the Tick Size Pilot.

[303] *See supra* note 125 and accompanying text.

[304] *See supra* notes 132–133 and accompanying text.

[305] *See* NMS plan Section I(CC) and 17 CFR 242.600(b)(64) defines Regular Trading Hours as the time between 9:30 a.m. and 4:00 p.m. Eastern Time.

[306] *See supra* notes 134–135 and accompanying text.

[307] Any new rules or changes to existing rules of the Participants would be subject to Section 19 of the Act. *See* 15 U.S.C. 78s.

[308] *See supra* Section IV.D.1.

[309] *See supra* note 136 and accompanying text.

[310] The Commenter did however acknowledge that removing Test Group One from the Tick Size Pilot would be a significant change. *See* KOR Letter II at 3.

One.[311] The Commission notes the quoting restrictions of Test Group One would be implemented in a manner similar to Rule 612, the Subpenny Rule.[312] Further, the Commission notes that the issue raised by the commenter is present in the current trading environment with Rule 612, where brokers may execute trades in increments finer than $0.01 so long as they do not accept, rank, or display orders in such increments. The Commission believes it is important to test and evaluate Test Group One with a design that is similar to the current trading environment and within the context of the Tick Size Pilot's incremental design that should permit qualitative comparison with Test Group Two and Test Group Three. Accordingly, the Commission does not believe it is necessary to modify the Tick Plan to address the distinction raised by the commenter.

While commenters have raised counterpoints, the Commission believes that it is necessary to initially test this incremental change to generate data to analyze the impact, if any, on market quality for the Pilot Securities in Test Group One. The Commission notes that Test Group One would only test how a wider quoting increment implemented using the current regulatory framework, reflected in Rule 612, could impact the liquidity and trading of smaller capitalization securities. Test Group One is not designed to favor one group of market participants over other groups of market participants any more than the existing regulatory framework. In particular, including Test Group One would allow the Tick Size Pilot to examine each change incrementally to identify the changes that are economically most important. Further, the Commission recognizes that the design of the Test Groups create differing incentives for the display and execution of orders which may result in the migration of order flow,[313] which is why the inclusion of Test Group One is vital. This Test Group could potentially generate data on the degree to which widening the quoting increment alone results in a migration to non-displaying trading centers.

Specifically, Test Group One should enhance the ability of the Tick Size Pilot to generate data on the effects of wider ticks and any resulting order flow migration on liquidity, execution quality, volatility, market maker profitability, competition, and transparency.

3. Test Group Two: Widened Quote and Trade Increment

Pilot Securities in Test Group Two would be required to be quoted in a $0.05 increment, like Test Group One, but trading would be limited to the $0.05 increment subject to three exceptions. Specifically, executions could occur at a price other than a $0.05 increment in the following circumstances: (1) midpoint executions at the NBBO or best protected bid and best protected offer; (2) retail price improvement of at least $0.005 better than the best protected bid or offer; and (3) Negotiated Trades.

After carefully weighing comments, the Commission believes that Test Group Two and the exceptions, including the exception for retail price improvement, are reasonably designed to generate data on how trading characteristics and liquidity would incrementally change relative to Test Group One if the trading increment is widened. The Commission believes it is important to measure the incremental impact of a trading increment on market quality for small capitalization stocks and it would be useful to compare the data generated by this Test Group against the data in Test Group One. As the Commission noted in the June 2014 Order, if the minimum quoting increment is changed without corresponding changes to the minimum trading increment, market participants may be hesitant to display liquidity in larger $0.05 increments if other market participants could easily trade ahead of them in smaller increments.

As noted above, commenters raised concerns with respect to the retail price improvement exception.[314] Some commenters argued that the exception should be broadened to include all orders as a means to alleviate implementation burdens. Some commenters argued that the level of price improvement should be increased to more than the proposed $0.005. Another commenter expressed its opposition to the retail exception because it believes that the exception would undermine the Tick Size Pilot.[315]

By allowing Retail Investor Orders to trade at certain prices other than the $0.05 trading increment and receive price improvement, the Commission believes that some of concerns related to costs for retail investors could be minimized. As noted earlier in Section V.A., retail investors may incur costs due to the Tick Size Pilot in the form of wider bid-ask spreads, which imply less favorable prices and high transaction costs if retail investors were required to trade only at the displayed quotation. As noted above, many potential Pilot Securities would have bid-ask spreads of greater than $0.05, although an equal number may have spreads less than $0.05. Therefore, the Tick Size Pilot could potentially widen bid-ask spreads of some Pilot Securities, which could increase costs for retail investors. The ability to receive price improvement, therefore, should reduce some retail investor costs. Further, the Commission does not believe that the exception for Retail Investor Orders would undermine the Tick Size Pilot and believes it is appropriate to provide this exception for retail investors.

The Commission, however, does not believe that it is necessary or appropriate to expand the price improvement exception to all orders. The Commission believes that such a modification could undermine the purpose of Test Group Two, which is to assess the impact of a trading increment on trading and liquidity. As noted above, this exception was designed to mitigate cost concerns for retail investors that typically receive price improvement under current trading conditions.[316]

Commenters stated that the attestation should not be required because it would be unwieldy for trading centers to conduct surveillance to ensure that only bona fide retail orders qualify.[317] The Commission notes that certain Participants have approved retail liquidity programs that require market participants to submit an attestation. Thus, many market participants must currently comply with an attestation requirement, and should already have the appropriate policies and procedures in place. While it should not be unwieldy for these trading centers to conduct surveillance for the attestation requirement, the Commission acknowledges that there would be additional costs for trading centers and their market participants that are not

[311] *See* BATS Letter at 3.

[312] 17 CFR 242.612.

[313] For example, if a larger minimum quoting increment leads to wider bid-ask spreads, but the trading increment remains unchanged, it would produce an incentive to internalize order flow and execute off-exchange because price improvement would be relatively cheaper to provide.

[314] *See supra* Section IV.D.2.

[315] *See supra* notes 155–156 and accompanying text.

[316] *See* June 2014 Order *supra* note 4.

[317] *See supra* Section IV.D.2. *See also* Tabb Letter at 5; Two Sigma Letter at 2 (''It is unclear how a trading center receiving order flow from large numbers of natural persons can design surveillance programs that would allow them to confidently make this attestation.''); KCG Letter at 9 (noting that the definition of Retail Investor Order was too complex and ambiguous and would lead to many of the largest retail firms to not sign the required attestations); STANY Letter at 6; and TD Ameritrade at 5.

currently required to comply with the attestation requirements. However, the Commission believes that the attestation requirement is necessary to promote the integrity and goals of the Tick Size Pilot by helping to ensure that only bona fide retail orders entered by market participants are eligible for the retail price improvement exception.

The Commission acknowledges that there are potential downsides to widening the quoting and trade increment to $0.05 but believes that the Tick Size Pilot is designed to reasonably balance the need to generate data and the potential higher costs for investors. The Commission also recognizes that the $0.05 quoting and trading increment for Test Group Two could have an effect on competition between exchanges and non-exchange trading centers, including the potential migration of order flow. The extent of any such potential order flow migration or other competitive impact is not known at this time. The Commission believes that the data analysis from the results of Test Group Two should provide information on the potential competitive impact and the incremental economic effects of a wider trading increment, including any incremental effects on the incentives for the display and execution of orders that may result in the migration of order flow relative to the other Test Groups and the Control Group. This should better inform the Commission and interested parties of the impact of a wider tick increment.

4. Test Group Three: Widened Quote and Trade Increment With a Trade-At Prohibition

Pilot Securities in Test Group Three would be quoted and traded in $0.05 increment like Test Group Two and provided with the same trading exceptions. In addition, Test Group Three would introduce another incremental change—the Trade-At Prohibition. In the June 2014 Order, the Commission described a trade-at prohibition as requiring a trading center that was not displaying at the NBBO at the time the trading center received an incoming marketable order to either: (1) execute the order with significant price improvement ($0.05 or the midpoint of the NBBO); (2) execute the order at the NBBO if the size of the incoming order is of block size; or (3) route intermarket sweep orders to execute against the full displayed size of the protected quotations at the NBBO and the execute the balance of the order at the NBBO price. In the Notice, the Commission noted that, in the context of the Tick Size Pilot, an important purpose of a trade-at requirement would be to test whether, in a wider tick environment, the ability of market participants to match displayed quotes, without quoting, would negatively affect market makers' quoting practices. The Commission further noted that if quoting practices were affected negatively, then it could undermine one of the central purposes of the Tick Size Pilot, namely to determine whether wider tick sizes positively affect market maker participation and pre-trade transparency. For example, if the results of Test Groups One and Two were to show an improvement in liquidity with wider tick increments but a loss to transparency because of an order flow migration to the OTC market, perhaps Test Group Three would show similar improvements to liquidity but without the loss to transparency.

The Participants proposed to define ''trade-at'' in the NMS plan as ''the execution by a trading center of a sell order for a Pilot Security at the price of a protected bid or the execution of a buy order for a Pilot Security at the price of a protected offer.'' [318] The Commission notes that the proposed definition of trade-at set forth in the NMS plan would require compliance with the Trade-At Prohibition outside of Regular Trading Hours. In particular, the NMS plan states that the Tick Size Pilot would be applicable during and outside of Regular Trading Hours.[319] The application of the Trade-At Prohibition outside of Regular Trading Hours would extend its application beyond what is currently required for the Trade-Through Rule under Regulation NMS.[320] As noted above, the Commission expects that market participants would be able to leverage existing Rule 611 systems for implementing and complying with the Tick Size Pilot, which currently do not apply outside of Regular Trading Hours. The application of the Trade-At Prohibition outside of Regular Trading Hours would be broader than what the Commission envisioned for trade-at and could increase implementation and compliance burdens for market participants. Therefore, the Commission has deemed it necessary to modify the definition of trade-at under the NMS plan to provide that it is only applicable during Regular Trading Hours.

Under the proposed Trade-At Prohibition, trading centers that are not quoting cannot match protected quotations and a trading center quoting at the protected quotation can execute orders but only up to the size of its displayed quotation. The Tick Size Pilot included thirteen exceptions to the Trade-At Prohibition, when trading centers may trade at a protected quotation or price match.

The Commission received several comments that opposed the inclusion of the Trade-At Prohibition.[321] Commenters raised concerns about the complexity and costs of implementing Test Group Three which they concluded could lead market participants to forego participation in Test Group Three and distort the resulting data. Other commenters suggested that the Trade-At Prohibition would increase operational risks. Several commenters suggested that Test Group Three should be eliminated to reduce the complexity related to the Tick Size Pilot. Other commenters suggested that the Trade-At Prohibition would increase investor costs if off-exchange venues are restricted in their ability to compete for executions. One commenter pointed to Australian and Canadian rules as evidence that market quality would be adversely affected and as a justification to not implement trade-at domestically.

Several commenters, however, supported the inclusion of the Trade-At Prohibition.[322] Commenters raised concerns that Test Group One and Test Group Two could provide less incentive for market participants to display liquidity and result in trades migrating to dark venues. As noted by several commenters, wider spreads, and the potential increased profits derived therefrom, could incentivize market participants to execute more transactions in Pilot Securities on dark venues.[323] Some commenters, therefore, supported including the Trade-At Prohibition to test its impact on displayed liquidity and market quality.

The data generated by this test group should inform the Commission, the public, and market participants on the incremental impact of the Trade-At Prohibition on trading characteristics and liquidity of Pilot Securities when the quoting and trading increments are widened. The Trade-At Prohibition should test whether market participants are incentivized to display more liquidity in a wider tick environment. Therefore, the Commission believes that the inclusion of the Trade-At Prohibition should enhance the utility of the Tick Size Pilot. Further, the data generated by Test Group Three would

[318] *See* NMS plan Section (I)(LL).

[319] *See* NMS plan Section (IX).

[320] The definition of ''trade-through'' in Rule 600(b)(77) of Regulation NMS provides that it is applicable during Regular Trading Hours. *See* 17 CFR 242.600(b)(77).

[321] *See supra* note 157 and accompanying text. *See also* Section IV.A.

[322] *See supra* note 169 and accompanying text.

[323] *See supra* note 176 and accompanying text.

allow the Commission and the public to test the incremental impact on displayed liquidity and market quality in a wider tick environment when compared to Test Group One and Test Group Two. As noted, several commenters stated that trading in Test Groups One and Two could migrate to non-displayed venues. As a control measure, the Commission believes that it is important to test whether given larger quoting and trading increments, market quality could be enhanced by an incentive to display liquidity such as the Trade-At Prohibition.[324]

However, the Commission acknowledges commenters' concerns about the cost and complexity of the Trade-At Prohibition. The Commission is therefore modifying the Trade-At Prohibition, as described below, to mitigate and address some of these concerns. The Commission believes that the modifications to the Trade-At Prohibition should reduce the complexity of the provision while maintaining its utility in the Tick Size Pilot. The modified Trade-At Prohibition, as well as the modification to extend the Tick Size Pilot's duration, should work in tandem to ensure that there is wider participation in the Tick Size Pilot.

The Commission recognizes that the Trade-At Prohibition may have some effect on competition between exchanges and non-exchange trading centers. However, the Commission does not believe that this modified Trade-At Prohibition should have significant effects on this competition. Non-exchange trading centers should continue to be able to compete with exchanges for order flow, albeit either in a displayed manner or by providing price improvement. Further, the Commission believes that the exceptions to the modified Trade-At Prohibition, such as the exception for Retail Investor Orders and Block Size orders, should exclude the types of transactions that occur primarily off-exchange.[325] As a result, the Trade-At Prohibition should not result in a migration to exchanges of transactions not likely to occur on exchanges in the Control Group. In addition, the Tick Size Pilot data should facilitate tests on the effect of a conditional Trade-At Prohibition on investors and the effect on competition of any resulting migration to exchanges. Finally, the Commission notes that the market structure and regulatory framework in Australia and Canada are very different from the U.S. market structure and regulatory framework. For example, the U.S. equity market structure includes higher levels of off-exchange trading and trading is dispersed among a large number of market centers.[326] Accordingly, the Commission believes the experiences of those jurisdictions with a trade-at prohibition are not clearly relevant when considering a trade-at prohibition in the context of the Tick Size Pilot. As discussed above, the Commission believes that the Trade-At Prohibition is necessary to fully study the impact on the liquidity and trading of smaller capitalization securities.

The Participants proposed deviations from, or additions to, the trade-at prohibition set forth in the June 2014 Order, as follows: (1) the proposed Trade-At Prohibition would apply to any protected bid or protected offer, rather than just the NBBO; (2) trading centers displaying a quote at the price of a protected quote on an SRO proprietary quote feed could execute an incoming order at that displayed price; (3) a trading center could only execute up to its displayed size (*i.e.,* Size Limitation); (4) a trading center must execute where the protected quotation is displayed (*i.e.,* Venue Limitation); (5) nine exceptions to the Trade-at Prohibition modeled after the exceptions found in Rule 611 of Regulation NMS; and (6) an exception for fractional shares.

a. Protected Quotations Standard

The Participants proposed to use a protected quotation standard rather than the NBBO for the Trade-At Prohibition. As described in the Notice, the protected quotation standard would give broader protection to aggressively displayed quotes because the protected quotation standard encompasses the aggregate of the most aggressively priced displayed liquidity on all trading centers, while the NBBO standard is limited to the single best order in the market.[327]

A few commenters opposed expanding the Trade-At Prohibition to protected quotations. One commenter suggested that protecting less competitive prices than the NBBO would undermine price competition and increase complexity,[328] while other commenters supported the protected quotation standard because it would encourage more aggressive quoting on multiple trading centers.[329]

After careful consideration, the Commission believes that using protected quotations as the basis for the Trade-At Prohibition is appropriate. The protected quotations standard should further enhance displayed liquidity by providing incentives for market participants and trading centers to display additional liquidity. The Commission does not believe that using protected quotations for the Trade-At Prohibition would necessarily result in less price competition. The Commission expects that market participants would continue to compete to provide liquidity via the best priced orders under the Tick Size Pilot.[330] Further, the Commission believes that using the protected quotations standard should help to alleviate concerns that the Tick Size Pilot is complex and costly to implement, as it would allow more displaying trading centers to execute orders at their displayed price and because market participants currently use the same standard to comply with Rule 611 of Regulation NMS.

b. SRO Quotation Feed

The Participants proposed to allow price matching by trading centers that have displayed a quote at the price of a protected quote through an SRO proprietary data feed. One commenter stated this feature would assist a trading center that cannot publish its own protected quotation.[331] The Commission believes that the use of an SRO proprietary data feed is appropriate. Trading centers displaying a quote on an SRO proprietary data feed have contributed to displayed liquidity, and therefore should be able to trade at these displayed prices, subject to the Size Limitation.

[324] The Commission notes that the inclusion of Test Group Three would not necessarily provide data that could examine whether a broader trade-at prohibition, applied to all securities with all tick sizes and fewer exceptions, would benefit investors.

[325] *See* Laura Tuttle, SEC Staff Paper, *OTC Trading: Description of Non-ATS Trading in National Market System Stocks,* (March 2014) available at *http://www.sec.gov/marketstructure/research/otc_trading_march_2014.pdf.*

[326] *See* Securities Exchange Act Release No. 61358 (January 14, 2010), 75 FR 3593 (January 21, 2010) (''Concept Release on Equity Market Structure'').

[327] *See* 17 CFR. 242.600(b)(42). When two or more market centers transmit to the plan processor identical bids or offers for an NMS security, the best bid or best offer is determined by ranking the identical bids or offers by size and then time. As a result, while two market centers may display identical prices, only one market center will display the national best bid or national best offer. Moreover, the Commission notes that the NBBO could contain manual quotations.

[328] *See supra* Section IV.D.3.a.

[329] Two other commenters requested clarification related to the protected quotation standard. The Commission notes that specific clarification questions should be addressed by the Participants during the implementation period. *See supra* note 181 and accompanying text.

[330] The Commission notes that Rule 611 of Regulation NMS would apply to transactions executed under the Tick Size Pilot.

[331] *See supra* Section IV.D.3.b.

c. Size Limitation

The Participants proposed to limit the price matching by trading centers that have displayed a protected quote with the Size Limitation. Under the Size Limitation, displaying trading centers would only be permitted to execute an incoming order up to the size of its protected quotation, and executions against undisplayed interest at that price level could not occur unless other protected quotations at that price are satisfied. Several commenters opposed the Size Limitation.[332] Commenters suggested that hidden reserve orders at the protected quotation price level should be allowed to execute without satisfying the other protected quotations. A few commenters believed that the Size Limitation would reduce execution certainty or cause delays in executions. Other commenters stated that the Size Limitation would lead to information leakage for larger sized orders because of the need to route to multiple venues to execute against protected quotes. Further, commenters stated that undisplayed liquidity, both on- and off-exchange, is important to retail and institutional investors.

While the June 2014 Order did not specify the Size Limitation, the Commission believes that it supports one of the reasons for testing trade-at in the Tick Size Pilot—to determine its impact on displayed liquidity and market quality in a wider tick environment. As one commenter noted, the Size Limitation should create a strong incentive to display liquidity.[333] The Commission notes that some commenters suggested that allowing hidden reserve orders to execute before same-priced protected quotations could incentivize market participants to display a quote for a nominal size. The Trade-At Prohibition is intended to test whether a trade-at is needed to encourage the display of limit orders with depth greater than a nominal size in a wider tick environment. During the Tick Size Pilot, Test Group Three should allow researchers to measure whether this structure results in increases in displayed liquidity, and if so, whether it has a positive impact on market quality. The Commission believes that without the Size Limitation, the incentive to display liquidity could be reduced, which in turn would undermine a primary rationale for testing trade-at in a wider tick environment. Commenters also raised concerns with respect to execution certainty and execution delay. The Commission believes that the Size Limitation could potentially increase execution certainty by providing incentives to display additional liquidity. The Commission believes that the Size Limitation's effect on execution delay is uncertain due to the potential increase in routing to execute against protected quotations, and would monitor results of the Tick Size Pilot to determine if there is significant execution delay.

The Commission also notes that the modification to the Block Size definition should mitigate and address some commenter concerns related to execution certainty and information leakage that some commenters believe could occur as a result of the Size Limitation. The reduced threshold for Block Size orders should lower the risk of market exposure for investors trading with size. The liberalized Block Size definition should permit more orders to trade without being restricted by the Trade-At Prohibition.

d. Venue Limitation

The Participants proposed the Venue Limitation that would restrict where a trading center that is displaying a quotation at the price of a protected quotation could execute incoming orders. Commenters stated that the inclusion of the Venue Limitation would protect displayed quotations, strengthen incentives for market making and gauge the impact of tick size increments.[334] Several other commenters, however, expressed concern that the Venue Limitation would increase the implementation costs and burdens for Test Group Three.[335] For example, one commenter noted that the Venue Limitation would increase message traffic and potentially cause systems failures.[336] Commenters also argued that the Venue Limitation was anti-competitive.[337] In particular, commenters stated that off-exchange trading centers should not be forced to route orders to the exchanges.

After carefully considering the comments, the Commission is modifying the Trade-At Prohibition to remove the Venue Limitation. The Commission notes that the Venue Limitation was not prescribed in the June 2014 Order. The Commission believes that the Venue Limitation would have unnecessarily restricted the ability of off-exchange market participants to execute orders in the Pilot Securities of Test Group Three.[338] Further, the Commission believes that the Venue Limitation would not have created additional incentives to display liquidity and thus is not necessary to support the purposes of the Trade-At Prohibition.[339] The Commission believes that the Size Limitation, as discussed above, should be sufficient to incentivize displayed liquidity because price matching generally would be permitted only if the market participant otherwise was publicly displaying an order in a size at least as large as the size of the matching transaction. The Commission does not believe the Venue Limitation would incentivize any material amount of additional displayed liquidity, and thus would not have provided additional economic information for the Tick Size Pilot.

Further, the Commission believes that removing the Venue Limitation should mitigate commenter concerns about the complexity and cost of implementing the Trade-At Prohibition by reducing the need for off-exchange trading centers to route orders to the exchanges. Therefore, the Commission deems it appropriate to change the NMS plan by removing the Venue Limitation.[340]

e. Modifying the Definition of Block Size

The Trade-At Prohibition proposed by the Participants included a Block Size order exception whereby the price matching of orders of a ''block size'' would be permitted. The Participants, consistent with the June 2014 Order, proposed to use the ''block size'' definition set forth in Regulation NMS, which is an order (1) of at least 10,000 shares or (2) with a market value of at least $200,000.[341] Several commenters explained that a block size order for small capitalization stocks is generally considered to be substantially smaller than that for large capitalization stocks, and thus the Trade-At Prohibition included in the proposed Tick Size Pilot

[332] *See supra* Section IV.D.3.c.

[333] *See* CHX Letter at 19. *See also supra* note 187 and accompanying text.

[334] *See supra* Section IV.D.3.d.

[335] *See supra* Section IV.D.3.d.

[336] *See* CMR Letter II at 7.

[337] *See supra* note 189 and accompanying text.

[338] A potential cost of the Venue Limitation would have been that a broker-dealer would need to connect to the ADF to display off-exchange, thereby incurring initial set-up costs for connectivity and costs to maintain that connectivity. In addition, each quote displayed on the ADF, in addition to an exchange, would result in costs to the broker-dealer related to message and recordkeeping capacity and fees and associated quoting activity costs to be paid to FINRA.

[339] The incremental effect of the Venue Limitation would be to encourage those who display on an exchange to display off-exchange.

[340] The Commission notes that the NMS plan includes three examples for how the Trade-At Prohibition would operate. Those examples do not implicate the Venue Limitation and therefore the Commission is not modifying the examples. *See* NMS plan *supra* note 3.

[341] 17 CFR 242.600(a)(9).

would unduly restrict institutional trading.[342]

In light of the views expressed by the commenters and after supplemental staff analysis, the Commission deems it is appropriate to modify the definition of ''block size,'' for purposes of the Tick Size Pilot. Specifically, an order (1) of at least 5,000 shares or (2) with a market value of at least $100,000 will be considered a block size for purposes of the Tick Size Pilot. This block size adjustment aligns with commenters' request for a smaller block size to reflect trading characteristics for potential Pilot Securities, and is consistent with the Commission staff analysis which indicates that, based on the modified selection criteria, the potential Pilot Securities, on average, trade at comparatively smaller sizes than securities with larger market capitalization. The following table reflects staff analysis:

TABLE 2 [343]—TRADE SIZE DISTRIBUTION STATISTICS

Shares/Dollars	Percent of trades	Percent of share volume	Percent of $ volume
Panel A: All NMS securities			
≥10,000 shares or ≥$200,000	0.24	13.04	16.27
Panel B: Stocks eligible for the Tick Size Pilot			
≥1,000 shares or ≥$20,000	2.08	26.61	23.37
≥3,000 shares or ≥$60,000	0.38	15.44	13.91
≥5,000 shares or ≥$100,000	0.18	12.03	11.24
≥10,000 shares or ≥$200,000	0.07	8.68	8.61

In particular, Table 2 indicates that among all NMS securities, trades with at least 10,000 shares or with a market value of at least $200,000 constitute 0.24 percent of all trades, 13.04 percent of traded share volume, and 16.27 percent of traded dollar volume. In contrast, among stocks eligible for the Tick Size Pilot, trades with at least 10,000 shares or with a market value of at least $200,000 constitute only 0.07 percent of all trades, 8.68 percent of traded share volume, and 8.61 percent of traded dollar volume.

The Commission received one comment suggesting that Block Size orders should be able to execute in subpenny increments in a manner similar to Retail Investor Orders that receive price improvement.[344] However, to avoid undermining the incremental design of the Tick Size Pilot, the Commission does not believe that Block Size orders in the Tick Size Pilot should have the same execution increments as Retail Investor Orders.

The Commission also notes that the modified Block Size definition should ease some of the burden related to the Trade-At Prohibition. Specifically, the modified Block Size definition should mitigate any potential disruption to the institutional trading of Pilot Securities by allowing more of such orders to match protected quotes. Therefore, the Commission deems it appropriate to modify the definition of Block Size to lower the thresholds.

f. Addressing Other Test Group Three Exceptions

The Participants proposed nine exceptions (numbers 4 through 12) to the Trade-At Prohibition that were not specified in the June 2014 Order. These exceptions were based on the exceptions to Rule 611.[345] Commenters raised concerns that the exceptions were too numerous and added to the complexity of the Tick Size Pilot.[346] One commenter, however, agreed with the rationale for using the Rule 611 exceptions.[347]

The Commission believes that these exceptions are appropriate. The Commission notes that market participants currently have rules, procedures, and systems in place to comply with Rule 611. Therefore, the Commission believes that the consistency with Rule 611 should alleviate concerns regarding the costs and burdens of implementing the Tick Size Pilot because market participants should be able to leverage existing systems.

The Commission recognizes the concerns related to modeling the Trade-At Prohibition exceptions on the Rule 611 exceptions. Specifically, the Commission notes that two commenters argued that the rationale for the Rule 611 exceptions should not be necessarily applied to the Trade-At Prohibition.[348] The Commission notes that approval of the Trade-At Prohibition is limited solely to the instant NMS plan and the Tick Size Pilot, and believes that utilizing current rules, procedures and systems should facilitate the implementation of the Tick Size Pilot.

The Participants also proposed an exception to the Trade-At Prohibition for fractional shares where fractional shares do not the result from dividing an order for one or more whole shares. One commenter supported this exception.[349] The Commission notes that there could be potential difficulty in the routing and executing of fractional shares and believes that such a limited exception is appropriate.

g. Odd Lots

The Commission notes that several commenters requested clarification on how odd lot orders would be treated under the Trade-At Prohibition.[350] Under Regulation NMS, odd lot orders are not considered protected quotations.[351] Since the Trade-At

[342] *See supra* Section IV.D.3.e.

[343] Data in Panel A covers all securities in the NYSE's Trade and Quote database, which consists of all NMS securities except options. Data in Panel B covers common stocks with average price greater than $2 per share, average daily trading volume smaller or equal than one million shares, and market capitalization smaller or equal than $3 billion. All data covers the period of July 1, 2013—August 31, 2013 and comes from the NYSE's Trade and Quote Data.

[344] *See supra* note 194 and accompanying text.

[345] 17 CFR 242.611(b)(2).

[346] *See supra* Section IV.D.3.f.

[347] *See* CHX Letter at 18 (supporting the exceptions as proposed).

[348] *See supra* note 196 and accompanying text.

[349] *See supra* Section IV.D.3.f.

[350] *See supra* Section IV.D.3.g.

[351] *See* Rule 600(b)(8) defines a bid or offer as the bid price or offer price communicated by a member of a national securities exchange or member of a national securities association to any broker or dealer, or to any customer, at which it is willing to buy or sell one or more round lots of any NMS security, as either principal or agent, but shall not include indications of interest. This definition of

Continued

Prohibition only applies to protected quotations, odd lot orders and the odd lot portion of mixed lot orders would therefore not be covered by the Trade-At Prohibition. On the other hand, if a trading center that is not displaying a quotation at the price equal to the traded-at protected quotation and then receives an odd lot order or the odd lot portion of a mixed lot order, the trading center would be prevented from executing the odd lot order at the price of the protected quotation unless an exception applies.[352]

E. Collection and Assessment of Tick Size Pilot Data

The Participants proposed Trading Center Data and Market Maker Profitability Data elements that were consistent with the June 2014 Order. Several commenters suggested that the data elements should be based solely on currently available data, such as the data reported to the processors, SRO proprietary data feeds, or under Rule 605, which would ease reporting burdens and costs.[353] However, as discussed below, the Commission believes that the Trading Center Data and Market Maker Profitability Data are necessary to provide the Commission and the public with measurable data on which to assess the Tick Size Pilot's impact.

1. Trading Center Data

The Tick Size Pilot would require the Participants to collect market quality statistics, data on specific orders, and data on market makers. The data would be publicly available on a monthly basis. Some commenters suggested that the Commission should rely on currently available data as this would reduce the implementation costs while still providing sufficient information to study the effects of the Tick Size Pilot.[354] However, the Commission believes that it is necessary to collect the Trading Center Data in order to fully analyze the Tick Size Pilot. These new data elements are important for assessing the Tick Size Pilot's impact on liquidity, execution quality, market maker activity, competition, and transparency and are not included currently in the publicly available data.[355]

In particular, the market quality statistics in the Trading Center Data expand in several important ways on the data reported under Rule 605. For example, compared to Rule 605 data, the market structure statistics are daily instead of monthly and will be publicly available more centrally, contain a broader set of orders, contain additional information on cancelations and hidden orders, and contain additional categories on order size and time to execution. As described in more detail below, the Trading Center Data are intended to build on an infrastructure that already exists for the collection of Rule 605 data and tailors the data from that infrastructure to the purposes of the Tick Size Pilot.

Requiring daily data and making it available more centrally should improve the feasibility of studying the Tick Size Pilot. Many liquidity and execution quality statistics using SIP data can be calculated, but these statistics are imperfect because they focus on trades instead of orders. For the purposes of assessing the Tick Size Pilot, execution quality of orders is more relevant. Rule 605 data, on the other hand, focuses on orders, but are available on a monthly aggregated basis and are from each of hundreds of trading centers. The daily frequency of the market quality statistics should allow for the study of the time series of metrics in a manner that provides a greater ability to statistically detect changes in market quality resulting from the Tick Size Pilot because it allows for the analysis of effects on a daily basis.[356] Requesting data that can be collected using existing Rule 605 infrastructure should reduce the incidence of data errors that result from creating a dataset from scratch which should increase the reliability of the data and reduce costs.

Including additional orders and reducing duplication could help to tailor the market quality statistics to the purposes of the Tick Size Pilot. The market quality statistics include a broader set of orders than Rule 605 statistics, with reduced double counting. In particular, the Tick Size Pilot requires producing market quality statistics on all orders regardless of inclusion in Rule 605 statistics, but includes only statistics on orders that the execution venue executes in part or full. The market quality statistics categorize some of the orders not included in Rule 605 data. In particular, the market quality statistics include categories for resting intermarket sweep orders, retail liquidity providing orders and midpoint passive liquidity orders and separates statistics by whether the statistics are for orders included in Rule 605 data or not. In addition, the market quality statistics include an order size category to capture orders of 10,000 shares or more, which are excluded from Rule 605. Because the purpose of Rule 605 differs from that of the Tick Size Pilot, studies of the Tick Size Pilot necessarily benefit from the inclusion of all orders that could be impacted by wider tick sizes. The Trading Center Data does not include the Rule 605 data on orders that are routed away in their entirety. The Rule 605 data for a particular trading center includes orders that a trading center routed away in their entirety. If this data was aggregated, it would produce double counting of these orders. Because Commission staff intends to aggregate the Trading Center Data across the trading centers, the Commission has decided to not require this information to prevent the likely double counting that could occur when such orders are routed in their entirety.[357]

Including additional data elements and categories in market quality statistics compared to Rule 605 allows for the study of key issues and helps to supplement other existing public data such as the data on the Commission's Market Structure Web site.[358] The additional market quality statistics include information on displayed or hidden order status, which would provide a more fulsome view of transparency than other sources of information on hidden orders including those on the Commission's Market Structure Web site.[359] The market structure statistics include significantly more refined time interval categories

bid or offer is embedded in the definition of ''quotation'' in Rule 600(b)(62), as well as the definition of ''protected bid'' or ''protected offer'' in Rule 600(b)(57). *See* ''Frequently Asked Questions Concerning Rule 611 and Rule 610, Question 7.03'', available at *https://www.sec.gov/divisions/marketreg/nmsfaq610–11.htm#sec7*.

[352] *See Data Highlight 2014–01: Odd Lot Rates in a Post-Transparency World,* (January 9, 2014), available at *http://www.sec.gov/marketstructure/research/sec_data_highlight_2014–01.pdf*.

[353] *See supra* Section IV.E.1.

[354] *Id.*

[355] Some commenters suggested that the data-collection requirements should be limited to data elements needed to assess the impact of the Tick Size Pilot on liquidity. While recognizing the importance of liquidity, as discussed throughout this order, measuring changes in liquidity is not the only goal of the Tick Size Pilot. Therefore, a broader range of data elements needs to be available for a full analysis of the Tick Size Pilot.

[356] Statistically, a daily time series provides greater ability for tests to detect changes resulting from the Tick Size Pilot.

[357] In addition, such orders would be attributed to the market center that routed them away and execution quality metrics for that market center would contain such orders that were not executed on the market center.

[358] The Commission's Market Structure Web site (*http://www.sec.gov/marketstructure/*) allows the public access to data derived from the Commission's MIDAS, which several commenters suggested as an alternative to the Trading Center Data. *See supra* Section IV.E.1.

[359] The Commission's Market Structure Web site provides data on hidden orders for only a subset of exchanges because not all exchanges provide hidden order information in their proprietary data feeds, which supply data to MIDAS.

(starting with microseconds rather than seconds) to measure speed of order executions and additional order categories. These changes allow for comparability to the statistics available on the Commission's Market Structure Web site. The Trading Center Data adds information on speed of order cancellations.[360] Because the Tick Size Pilot may affect investors' behavior regarding cancellations, the ability to observe those changes would help to better understand the effects of the Tick Size Pilot.

The Trading Center Data on specific orders provides disaggregated execution, cancellation and routing statistics for individual market and marketable limit orders. This type of information is not available from any public source or from any raw data source that, as a practical matter, is available in an easily and publicly accessible manner to meet the needs of the Tick Size Pilot. As noted above, order information is more relevant for studies of the Tick Size Pilot than SIP data because order information can consider the full order size. The data on specific orders improves on the market quality statistics by allowing researchers to more directly test hypotheses on the effect of the Tick Size Pilot on quote competition and transparency, for example. Researchers can also supplement statistics they derive from this data with statistics on limit orders from the Commission's Market Structure Web site.

Finally, the Trading Center Data includes daily statistics on registration and participation of market makers. Information on market maker registration and participation is necessary to test the hypothesis that widening the tick size could encourage market making in such a way to improve the liquidity and trading of small capitalization stocks, which could potentially allow such issuers to raise capital more easily. Such data is not available publicly, except from a few exchanges.

Because of these enhancements, the Commission believes that collections of Trading Center Data should facilitate a significantly richer analysis than the public data of the effects of the Tick Size Pilot on liquidity (*e.g.,* transaction costs by order size), execution quality (*e.g.,* speed of order executions), market maker activity, competition between trading venues (*e.g.,* routing frequency of market orders), transparency (*e.g.,* choice between displayed and hidden orders), and market dynamics (*e.g.,* rates and speed of order cancellations), and thus is necessary to fully assess the impact of the Tick Size Pilot.

2. Market Maker Profitability Data

The Tick Size Pilot would require market makers to produce the Market Maker Profitability Data, which relates to daily trading profits on the Pilot Securities. Several commenters opposed the collection of Market Maker Profitability Data.[361] Commenters raised concerns about the costs of collecting the data as well as concerns related to the confidentiality and the competitive impact of the data. Commenters suggested that market makers would forego participation in the Tick Size Pilot if they were required to submit their Market Maker Profitability Data.

The Commission notes that one of the premises behind the Tick Size Pilot is that a widened tick increment could increase market maker profits and that the increased profits could foster a more robust secondary market for small capitalization stocks (and ultimately a more robust primary market) by, for example, increasing liquidity, enhancing the attractiveness of acting as a market maker, and possibly increasing the provision of sell-side research. Without the Market Maker Profitability Data, the Commission and the public would not be able to test this hypothesis. In light of the comments on the costs of producing the Market Maker Profitability Data and the confidentiality of the data, however, the Commission deems it necessary to modify this data-collection requirement in two ways.

First, the Commission is eliminating the data element which required realized trading profits net of fees and rebates from the list of the required market maker profitability statistics and the data element that would have required the DEA to calculate the volume-weighted average of market maker realized traded profits net of fees and rebates. Some commenters expressed concern that because fees and rebates are charged monthly and in an aggregate form, the fees and rebates could be difficult to assign to daily trades in specific securities. As a result, data on market maker realized trading profits net of fees and rebates could be difficult to produce accurately and in a cost effective manner.

After carefully considering these comments, the Commission is eliminating these data elements from the list of the required Market Maker Profitability Data because of the difficulties in calculating the data and the concerns about the costs related to the calculation. Eliminating this data element should ease the implementation burdens and costs to produce the data. Further, the Commission recognizes that changes in raw realized trading profits may be more relevant for the economic relation the Tick Size Pilot is addressing. The Commission believes that the data on realized raw trading profits and unrealized raw trading profits should be sufficient to support robust analysis.[362]

Second, to address confidentiality concerns the Commission is modifying the NMS plan to require further aggregation of all Market Maker Profitability Data for public dissemination. Some commenters expressed concern about dissemination of Market Maker Profitability Data (even in aggregate form for each security) and opined that some designated market makers could deregister from Pilot Securities to avoid providing profitability data. The Commission recognizes that some Pilot Securities may have a relatively small number of designated market makers, and that in these cases aggregating profitability data across market makers may be insufficient to fully protect the confidentiality of profits of individual

[360] A wider tick size may change the composition of the market participants for a given stock and it may also change their behavior. For example, ''pinging'' the market, which results in frequent and fast cancellations, becomes more expensive and therefore less attractive. As a result, the practice may be used less in stocks with a wider tick size.

[361] *See supra* Section IV.E.2.

[362] The Commission believes that the costs of producing the modified Market Maker Data may not be high and the Commission understands that market makers may capture trading profit data for internal business purposes. One commenter suggested that measuring market maker profitability for each security may be difficult because ''costs [of market making] are typically allocated to trading across the board, rather than on a symbol-by-symbol basis.'' In response to this comment, the Commission notes that the modified Market Maker Data is limited to measures of gross trading profitability, which do not require information on general operating costs (or allocation of these costs to specific securities). Another commenter mentioned that some market makers may not currently compute their profits on a LIFO basis. However, the Commission believes that even for these market makers it should be fairly easy to implement a LIFO-like method for computing their profits as required by the Tick Size Pilot. Independent of which specific method, *e.g.,* LIFO, FIFO, or average cost basis, is used to compute profits, the same information has to be collected, processed, and stored. The only difference is the formula for computation. The Commission recognizes that there will be costs associated with computing profits in a manner different than current profit calculations. However, the requirement to produce profitability figures for the Tick Size Pilot does not mean that market makers are required to change how they currently compute trading profits for internal business purposes. For example, a market maker may continue to use a FIFO-like method for internal profit computations and only report profits on a LIFO basis for the purpose of the Tick Size Pilot. This would alleviate the risk for disruptions due to a change in their practices.

market makers. For example, some smaller market makers may be able to use aggregate data to infer the profitability of their larger competitors, which could give them an unfair competitive advantage. To address the confidentiality concerns raised by commenters and to ensure that public dissemination of the Market Maker Data does not adversely impact competition between market makers, the Commission has determined that the DEA should further aggregate the Market Maker Profitability Data by each Test Group and Control Group such that the public data will not contain profitability measures for each security. The Commission notes that the data available to Participants and the Commission would continue to identify the market maker profits in individual stocks.[363] As a result of this change, the public would not have the ability to match individual stocks in the Test Groups with stocks from the Control Group and compare changes in profitability between stocks from the Test Groups and the matched stocks. The Commission, however, believes this modification should adequately address confidentiality concerns related the dissemination of detailed Market Maker Profitability Data. Therefore, the Commission deems it appropriate to modify the Market Maker Profitability Data as described above.

Some commenters suggested that the disclosure of Market Maker Profitability Data to DEAs may be anti-competitive, as market makers would essentially have to disclose sensitive, proprietary information to their exchange competitors. In response to these comments, the Commission notes that many market makers are already required to provide profitability information to their DEAs as part of their registration requirements and by virtue of their membership with a national securities exchange or association. Thus, the Commission believes that the additional impact of the disclosing Market Maker Data is not likely to be significant. Moreover, the Commission emphasizes that the Participants are expected to collect and use Tick Size Pilot data, including Market Maker Profitability Data, for legitimate regulatory purposes, and not for inappropriate, anti-competitive purposes.

[363] The Commission notes that it will keep this information confidential, subject to the provisions of applicable law. Additionally, as noted below, because the Participants will have data that is more detailed than the public, the Commission has determined that the SROs should provide an assessment of Market Maker Profitability Data. *See infra* Section V.E.3.

3. Assessment of Tick Size Pilot Data

The Tick Size Pilot would require the Participants to provide a joint assessment on the impact of the Tick Size Pilot, no later than six months after the end of the Pilot Period. In the June 2014 Order, the Commission identified certain assessments that the Participants were to conduct and to submit to the Commission. However, the Participants did not include the assessment related to the impact of quoting and trading increments on the profitability of market makers in the proposed Tick Size Pilot because, in their view, the market makers would be better positioned, compared to the Participants, to analyze such data.[364]

As previously noted, the impact of a wider tick size on market maker profitability is an important assessment to be conducted. In addition, the Commission has modified the Market Maker Profitability Data to require further aggregation of publically released data. While the public will still be able to study this aggregated profitability data, the public is limited in its ability to conduct an independent assessment based on the more granular profitability data available to the Participants and the Commission. Therefore, the Commission is modifying the NMS plan to reflect that the Participants are required to conduct and submit this assessment. The Commission deems it appropriate to modify the NMS plan to require this assessment.

The Commission is also modifying the timing when the impact assessments should be prepared by the Participants and submitted to the Commission. In particular, the Commission is modifying the NMS plan to require the Participants to submit their assessments 18-months after the Tick Size Pilot begins based on data generated during the first year of the Tick Size Pilot or a subset of which that represents the impact of the Tick Size Pilot. The Commission notes that the timing for when the assessments are due to the Commission has not changed. As proposed, the Participants would have submitted their assessment six months after the end of the Pilot Period (which would have been 18-months after the Tick Size Pilot was implemented). This modification has been made in relation to the modified Pilot Period. As a result, the Commission will receive the impact assessment of the Tick Size Pilot six months prior to its completion. The Commission is not modifying the NMS plan to require the Participants to conduct more frequent periodic impact assessments as some commenters' suggested [365] because it does not believe that the incremental benefit of such additional assessment would justify the increased burdens and costs on the Participants. The Commission deems it appropriate to modify the timing of the Participant assessments because it would provide the Commission and the public with relevant data on the impact of the Tick Size Pilot before the Pilot Period ends.

[364] *See* Notice, 79 FR at 66428, *supra* note 5.

Commenters also stated that the Commission should define success metrics for the Tick Size Pilot and what would warrant it being adopted on a permanent basis.[366] The Commission has carefully considered these comments but believes that defining the success metrics before the Tick Size Pilot begins could unduly influence behavior by market participants. The Tick Size Pilot is intended to be a test to inform the Commission and the public about the possible impacts of a wider tick size in small capitalization securities. The NMS plan sets forth the data elements that the Commission believes would be informative and support broad analysis. The Commission has described the questions that it believes the data should be able to address. In particular, the Commission believes that the Tick Size Pilot as designed should generate data that would support analysis and studies of the effect of increased tick size on liquidity, execution quality for investors, volatility, market maker profitability, competition, transparency and institutional ownership. The results of the Tick Size Pilot could reveal tradeoffs among these and other considerations and the potential permutations in the results are likely to be too extensive to define success at this point.

F. Use of an NMS Plan

Certain commenters suggested that the Tick Size Pilot should be implemented via Commission rulemaking, rather than through the NMS plan process.[367] Some commenters suggested that the Tick Size Pilot was too significant to be delegated to the Participants and raised concerns that not all market participants, including market makers, broker-dealers and institutional investors, were included in the development of the Tick Size Pilot. Certain commenters were concerned about potential conflict of interests that could arise in the Participants'

[365] *See supra* Section IV.E.3.

[366] *Id.*

[367] *See supra* Section IV.F.

development of the NMS plan. A number of commenters questioned whether it was appropriate to have Participants formulate an NMS plan that would affect their competitors. Additionally, some commenters intimated that a conflict of interest may exist by highlighting the Participants' for-profit status.

As discussed above, the Commission has reasons to proceed with the Tick Size Pilot as an NMS plan.[368] The process for an NMS plan has some similarities to a rulemaking. Like a Commission rulemaking, an NMS plan is subject to public notice and comment, which provides all interested parties, including market makers, broker-dealers, investors, and issuers, an opportunity to offer substantive comment on the plan prior to Commission consideration of whether to approve it. The Commission published this NMS plan and therefore, it was subject to notice and comment.[369] In addition, the process is subject to Commission's oversight and approval authority. In this regard, Rule 608(b)(2) provides that the Commission shall approve an NMS plan, with such changes or subject to such conditions as the Commission may deem necessary or appropriate, if it finds that such plan or amendment is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Act.[370] As discussed throughout this order, the Commission believes the NMS plan meets the standard for approval and has exercised its authority to modify this NMS plan consistent with the standard.

Certain commenters raised concerns related to the role of the Participants, and of potential conflicts of interest, in the development of the Tick Size Pilot. The Commission recognizes that most of the Participants are for-profit exchanges that compete in various respects with their broker-dealer members. However, the Participants also are self-regulatory organizations, with specified regulatory obligations under the Act and Commission rules. Among other things, Section 11A(a)(3) of the Act, and Rule 608 thereunder, contemplate that SROs may act jointly in furtherance of their regulatory obligations by developing and filing proposed NMS plans with the Commission and, if approved, operating them subject to the Commission's oversight and authority.[371] The Commission recognizes that certain provisions of the NMS plan could have a competitive impact on broker-dealer members and other market participants. The Rule 608 process, however, requires that proposed NMS plans be published for public comment and subject to Commission review and approval. As discussed above, the Commission has reviewed the NMS plan and thoroughly evaluated commenters' concerns, including those relating to the impact of the Tick Size Pilot on competition. The Commission has modified the NMS plan by removing the Venue Limitation, which it believes would have placed an unnecessary burden on competition, and the Commission exercised its authority to make other modifications to address other concerns.

G. Issuer Participation

Commenters suggested that issuers should have the ability to opt-in or opt-out of the Tick Size Pilot,[372] or establish committees that represent the interests of issuers during the Tick Size Pilot. One commenter believed that instead of approving the Tick Size Pilot, the Commission should permit issuers to contract with market makers for the purpose of determining their spreads. The Commission has carefully considered these comments but believes that in order to generate useful and reliable data from the Tick Size Pilot, issuers should not be able to opt-in or opt-out. Allowing such an option would introduce a selection bias that would make the results of the Tick Size Pilot applicable only to the participating securities and limit the ability of researchers to draw specific conclusions about the impact of wider tick sizes on market for small capitalization stocks. The Commission believes that permitting issuers to contract with market makers for the purpose of determining spreads would similarly introduce selection bias and undermine the goal of the Tick Size Pilot.[373]

H. Implementation

Commenters noted that a one-year implementation period could be appropriate if the Tick Size Pilot was simplified, by among other things, removing the Trade-At Prohibition. [374] While the Commission has not removed the Trade-At Prohibition, the Commission believes that the modifications to the Tick Size Pilot, such as restricting the Trade-At Prohibition to Regular Trading Hours, removing the Venue Limitation and removing realized trading profits net of fees and rebates from the Market Maker Profitability Data, should lessen some of the implementation burdens.

Accordingly, the Commission believes that he Tick Size Pilot should be implemented within one year after the publication of this order. The Commission believes that the one year period for implementation should provide adequate time for the development and testing of applicable trading and compliance systems, the filing and approval of SRO rules related to the Tick Size Pilot's quoting and trading requirements, and the development and implementation of the written policies and procedures by Participants and their members that are reasonably designed to comply with the applicable quoting and trading increments.

Certain commenters requested that the Commission, or the Participants, release detailed frequently-asked-questions (''FAQs'') to assist implementation of the Tick Size Pilot.[375] As the implementation period progresses, should questions arise, the Commission and the Participants will consider whether to issue FAQs to address any such questions.

One commenter requested that the list of securities be finalized prior to determining the implementation schedule.[376] The Commission does not believe it is necessary to finalize the list of securities prior to determining the implementation schedule. The Commission notes that the list of securities would be finalized based on data collected during the Measurement Period. [377] To avoid including Pilot Securities whose characteristics would not meet the defined selection criteria, the time gap between the Measurement Period and the beginning of the Pilot Period should be as short as possible. For example, the NMS plan includes price as one criterion in the selection of securities such that the closing price be at least $1.50 on every trading day

[368] *See supra* Section V.A.

[369] *See* Notice *supra* note 5.

[370] 17 CFR 242.608(b)(2).

[371] 15 U.S.C. 78k-1(a)(3). *See* 17 CFR 242.608.

[372] *See supra* Section IV.G.

[373] In addition, the Commission notes that certain exchanges currently operate pilot programs that permit issuers to, indirectly through the exchange, compensate market makers to provide liquidity in the issuers' securities. *See, e.g.,* NYSE Arca Equities Rule 8.800 (NYSE Arca Equities ETP Incentive Program); BATS Rule 11.8.02 (BATS Competitive Liquidity Provider Program); and Nasdaq Rule 5950 (Market Quality Program).

[374] *See supra* note 244 and accompanying text.

[375] *See* KCG Letter at 17; Liquidnet Letter at 2; and Bloomberg Letter at 20.

[376] *See* Bloomberg Letter at 20.

[377] *See* NMS plan Section (I)(N), which defines the Measurement Period as the U.S. trading days during the three-calendar-month period ending at least 30 days prior to the effective date of the Pilot Period.

during the Measurement Period. If the Measurement Period ended six months before the start of the Tick Size Pilot, the risk that securities may have prices below $1.00 during the Tick Size Pilot would be higher than the risk with a later Measurement Period.

VI. Conclusion

For the reasons discussed above, the Commission finds that the NMS *Plan to Implement a Tick Size Pilot Program* is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of, a national market system, or otherwise in furtherance of the purposes of the Act.

It is therefore ordered, that pursuant to Section 11A of the Act, and the rules and regulations thereunder, that the NMS plan (File No. 4–657), as modified, be and it hereby is approved and declared effective, and the Participants are authorized to act jointly to implement the NMS plan and its Tick Size Pilot as a means of facilitating a national market system.

By the Commission.

Brent J. Fields,

Secretary.

Exhibit A

Plan To Implement a Tick Size Pilot Program Submitted to the Securities and Exchange Commission Pursuant to Rule 608 of Regulation NMS Under the Securities Exchange Act of 1934 (*As Modified by the Commission; additions are in underline and deletions are in [brackets]*)

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Preamble

Pursuant to Section 11A(a)(3)(B) of the Exchange Act, which authorizes the SEC to require by order self-regulatory organizations to act jointly with respect to matters as to which they share authority in planning, developing, operating, or regulating a national market system, the SEC issued an order directing the Participants to submit a Tick Size Pilot Plan as a national market system plan pursuant to Rule 608(a)(3) of Regulation NMS under the Exchange Act. In response, the Participants submit this Plan to implement a Tick Size Pilot Program that will allow the Commission, market participants, and the public to study and assess the impact of increment conventions on the liquidity and trading of the common stocks of small capitalization companies. To do so, the Plan provides for the widening of quoting and trading increments for a group of Pilot Securities. As detailed herein, the Pilot Securities will be subdivided into three Test Groups and a Control Group, each with its own requirements and exceptions relating to quoting and trading increments to facilitate the referenced analysis.

I. Definitions

(A) ''Average effective spread'' has the meaning provided in Rule 600(b)(5) of Regulation NMS under the Exchange Act.

(B) ''Average realized spread'' has the meaning provided in Rule 600(b)(6) of Regulation NMS under the Exchange Act.

(C) ''Benchmark trade'' means the execution of an order at a price that was not based, directly or indirectly, on the quoted price of a Pilot Security at the time of execution and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made.

(D) ''Best protected bid'' means the highest priced protected bid.

(E) ''Best protected offer'' means the lowest priced protected offer.

(F) ''Block Size'' *means for purposes of this Tick Size Pilot Program, an order (1) of at least 5,000 shares or (2) for a quantity of stock having a market value of at least $100,000* [has the meaning provided in Rule 600(b)(9) of Regulation NMS under the Exchange Act].

(G) ''Brokered cross trade'' means a trade that a broker-dealer that is a member of a Participant executes directly by matching simultaneous buy and sell orders for a Pilot Security.

(H) ''Closing Price'' means the closing auction price on the primary listing exchange, or if not available, then the last regular-way trade reported by the processor prior to 4:00 p.m. ET.

(I) ''Designated Examining Authority'' means, with respect to a member of two or more self-regulatory organizations, the self-regulatory organization responsible for (i) examining such member for compliance with the financial responsibility requirements imposed by the Exchange Act, or by Commission or self-regulatory organization rules, (ii) receiving regulatory reports from such member, (iii) examining such member for compliance with, and enforcing compliance with, specified provisions of the Exchange Act, the rules and regulations thereunder, and self-regulatory organization rules, and (iv) carrying out any other specified regulatory functions with respect to such member.

(J) ''Exchange Act'' means the Securities Exchange Act of 1934, as amended.

(K) ''Inside-the-quote limit order,'' ''at-the-quote limit order,'' and ''near-the-quote limit order'' mean non-marketable buy orders that are ranked at a price, respectively, higher than, equal to, and lower by $0.10 or less than the National Best Bid at the time of order receipt, and non-marketable sell orders that are ranked at a price, respectively, lower than, equal to, and higher by

$0.10 or less than the National Best Offer at the time of order receipt.

(L) ''Market Maker'' means a dealer registered with any self-regulatory organization, in accordance with the rules thereof, as (i) a market maker or (ii) a liquidity provider with an obligation to maintain continuous, two-sided trading interest.

(M) ''Marketable limit order'' means any buy order with a limit price equal to or greater than the National Best Offer at the time of order receipt, or any sell order with a limit price equal to or less than the National Best Bid at the time of order receipt. For price sliding, pegged, discretionary, or similar order types where the ranked price is different from the limit price, the ranked price will determine marketability.

(N) ''Measurement Period'' means the U.S. trading days during the three-calendar- month period ending at least 30 days prior to the effective date of the Pilot Period.

(O) ''National Best Bid'' and ''National Best Offer'' have the meanings provided in Rule 600(b)(42) of Regulation NMS under the Exchange Act.

(P) ''Negotiated Trade'' means (i) a Benchmark trade, including, but not limited to, a Volume-Weighted Average Price trade or a Time-Weighted Average Price trade, provided that, if such a trade is composed of two or more component trades, each component trade complies with the quoting and trading increment requirements of the Plan, or with an exception to such requirements, or (ii) a Pilot Qualified Contingent Trade.

(Q) ''NMS common stock'' means an NMS stock that is common stock of an operating company.

(R) ''NMS stock'' has the meaning provided in Rule 600(b)(47) of Regulation NMS under the Exchange Act.

(S) ''Operating Committee'' has the meaning provided in Section III(C) of the Plan.

(T) ''Participant'' means a party to the Plan.

(U) ''Pilot Period'' means the operative period of the Tick Size Pilot Program, lasting [one] *two* years from the date of implementation.

(V) ''Pilot Qualified Contingent Trade'' means a transaction consisting of two or more component orders, executed as agent or principal, where: (1) at least one component order is in an NMS common stock; (2) all components are effected with a product or price contingency that either has been agreed to by the respective counterparties or arranged for by a broker-dealer as principal or agent; (3) the execution of one component is contingent upon the execution of all other components at or near the same time; (4) the specific relationship between the component orders (*e.g.,* the spread between the prices of the component orders) is determined at the time the contingent order is placed; (5) the component orders bear a derivative relationship to one another, represent different classes of shares of the same issuer, or involve the securities of participants in mergers or with intentions to merge that have been announced or since canceled; and (6) the transaction is fully hedged (without regard to any prior existing position) as a result of the other components of the contingent trade.

(W) ''Pilot Securities'' means those securities that satisfy the criteria established in Section V.

(X) ''Plan'' means the plan set forth in this instrument, as amended from time to time in accordance with its provisions.

(Y) ''Processor'' means the single plan processor responsible for the consolidation of information for an NMS stock pursuant to Rule 603(b) of Regulation NMS under the Exchange Act.

(Z) ''Protected bid'' and ''protected offer'' have the meanings provided in Rule 600(b)(57) of Regulation NMS under the Exchange Act.

(AA) ''Protected quotation'' has the meaning provided in Rule 600(b)(58) of Regulation NMS under the Exchange Act.

(BB) ''Quotation'' has the meaning provided in Rule 600(b)(62) of Regulation NMS under the Exchange Act.

(CC) ''Regular Trading Hours'' has the meaning provided in Rule 600(b)(64) of Regulation NMS under the Exchange Act. For purposes of the Plan, Regular Trading Hours can end earlier than 4:00p.m. ET in the case of an early scheduled close.

(DD) ''Retail Investor Order'' means an agency order or a riskless principal order originating from a natural person, provided that, prior to submission, no change is made to the terms of the order with respect to price or side of market and the order does not originate from a trading algorithm or any other computerized methodology. The Participant that is the Designated Examining Authority of a member of a Participant operating a trading center executing a Retail Investor Order will require such trading center to sign an attestation that substantially all orders to be executed as Retail Investor Orders will qualify as such under the Plan.

(EE) ''Retail liquidity providing order'' means an order entered into a Participant-operated retail liquidity program to execute against Retail Investor Orders.

(FF) ''SEC'' means the United States Securities and Exchange Commission.

(GG) ''SRO quotation feed'' means any market data feed disseminated by a self-regulatory organization.

(HH) ''Tick Size Pilot Program'' means the program established by this Plan and by the corresponding rules of the Participants.

(II) ''Time of order execution'' means the time (to the second, or to such smaller increments as are available) that an order was executed at any venue.

(JJ) ''Time of order receipt'' means the time (to the second, or to such smaller increments as are available) that an order was received by a trading center for execution.

(KK) ''Time-Weighted Average Price'' means the price calculated as the average price of a security over a specified period of time.

(LL) ''Trade-at'' means the execution by a trading center of a sell order for a Pilot Security at the price of a protected bid or the execution of a buy order for a Pilot Security at the price of a protected offer *during Regular Trading Hours.*

(MM) ''Trade-at Intermarket Sweep Order'' means a limit order for a Pilot Security that meets the following requirements:

(1) When routed to a trading center, the limit order is identified as an Intermarket Sweep Order; and

(2) Simultaneously with the routing of the limit order identified as an Intermarket Sweep Order, one or more additional limit orders, as necessary, are routed to execute against the full displayed size of any protected bid, in the case of a limit order to sell, or the full displayed size of any protected offer, in the case of a limit order to buy, for the Pilot Security with a price that is equal to the limit price of the limit order identified as an Intermarket Sweep Order. These additional routed orders also must be marked as Intermarket Sweep Orders.

(NN) ''Trading center'' has the meaning provided in Rule 600(b)(78) of Regulation NMS under the Exchange Act.

(OO) ''Volume-Weighted Average Price'' means the price calculated by summing up the products of the number of single-counted shares traded and the respective share price, and dividing by the total number of single-counted shares traded.

II. Parties

(A) List of Parties

The parties to the Plan are as follows:

(1) BATS Exchange, Inc., 8050 Marshall Drive, Lenexa, Kansas 66214
(2) BATS Y-Exchange, Inc., 8050 Marshall Drive, Lenexa, Kansas 66214
(3) Chicago Stock Exchange, Inc., 440 South LaSalle Street, Chicago, Illinois 60605
(4) EDGA Exchange, Inc., 545 Washington Boulevard, Sixth Floor, Jersey City, NJ 07310
(5) EDGX Exchange, Inc., 545 Washington Boulevard, Sixth Floor, Jersey City, NJ 07310
(6) Financial Industry Regulatory Authority, Inc., 1735 K Street NW., Washington, DC 20006
(7) NASDAQ OMX BX, Inc., One Liberty Plaza, New York, NY 10006
(8) NASDAQ OMX PHLX LLC, 1900 Market Street, Philadelphia, PA 19103
(9) The Nasdaq Stock Market LLC, 1 Liberty Plaza, 165 Broadway, New York, NY 10006
(10) New York Stock Exchange LLC, 11 Wall Street, New York, NY 10005
(11) NYSE MKT LLC, 11 Wall Street, New York, NY 10005
(12) NYSE Area, Inc., 11 Wall Street, New York, NY 10005

(B) Compliance Undertaking

By subscribing to and submitting the Plan for approval by the SEC, each Participant agrees to comply with, and to enforce compliance by its members, as applicable, with the provisions of the Plan as required by Rule 608(c) of Regulation NMS under the Exchange Act. To this end, each Participant will adopt rules requiring compliance by its members with the provisions of the Plan, as applicable, and adopt such other rules as are needed for such compliance.

(C) New Participants

The Participants agree that any entity registered as a national securities exchange or national securities association under the Exchange Act may become a Participant by: (1) executing a copy of the Plan, as then in effect; (2) providing each then-current Participant with a copy of such executed Plan; and (3) effecting an amendment to the Plan as specified in Section III(B) of the Plan.

III. Amendments to Plan

(A) General Amendments

Except with respect to the addition of new Participants to the Plan, any proposed change in, addition to, or deletion from the Plan will be effected by means of a written amendment to the Plan that: (1) sets forth the change, addition, or deletion; (2) is executed on behalf of each Participant; and (3) is approved by the SEC pursuant to Rule 608 of Regulation NMS under the Exchange Act, or otherwise becomes effective under Rule 608 of Regulation NMS under the Exchange Act.

(B) New Participants

With respect to new Participants, an amendment to the Plan may be effected by the new national securities exchange or national securities association executing a copy of the Plan, as then in effect (with the only changes being the addition of the new Participant's name in Section II(A) of the Plan) and submitting such executed Plan to the SEC for approval. The amendment will be effective when it is approved by the SEC in accordance with Rule 608 of Regulation NMS under the Exchange Act, or otherwise becomes effective pursuant to Rule 608 of Regulation NMS under the Exchange Act.

(C) Operating Committee

(1) Each Participant will select from its staff one individual to represent the Participant as a member of an Operating Committee, together with a substitute for such individual. The substitute may participate in deliberations of the Operating Committee and will be considered a voting member thereof only in the absence of the primary representative. Each Participant will have one vote on all matters considered by the Operating Committee. No later than the initial date of Plan operations, the Operating Committee will designate one member of the Operating Committee to act as the Chair of the Operating Committee.

(2) The Operating Committee will monitor the procedures established pursuant to this Plan and advise the Participants with respect to any deficiencies, problems, or recommendations as the Operating Committee may deem appropriate. The Operating Committee will establish specifications and procedures for the implementation and operation of the Plan that are consistent with the provisions of this Plan. With respect to matters in this paragraph, Operating Committee decisions must be approved by a simple majority vote.

(3) Any recommendation for an amendment to the Plan from the Operating Committee that receives an affirmative vote of at least two-thirds of the Participants, but is less than unanimous, will be submitted to the SEC as a request for an amendment to the Plan initiated by the Commission under Rule 608 of Regulation NMS.

IV. Policies and Procedures

Consistent with the compliance undertakings set out in Section II(B), all Participants and members of Participants will be required to establish, maintain, and enforce written policies and procedures that are reasonably designed to comply with applicable quoting and trading requirements specified in Section VI for the Pilot Securities.

Each Participant, as applicable, will develop appropriate policies and procedures that provide for collecting and reporting to the SEC the data described in Appendix B. In addition, each Participant that is the Designated Examining Authority of a member of a Participant operating a trading center will require such member to develop appropriate policies and procedures for collecting and reporting the data described in Items I and II of Appendix B, as applicable, to the Designated Examining Authority. Each Participant that is the Designated Examining Authority of a member of a Participant operating a trading center will develop appropriate policies and procedures, as applicable, that provide for collecting and reporting such data to the SEC. The data collection and reporting obligations are described below in Section VII.

Each Participant that is the Designated Examining Authority of a Market Maker will require such Market Maker to develop policies and procedures for collecting the data set out in Appendix C and reporting it to the Designated Examining Authority. Each Participant that is the Designated Examining Authority of a Market Maker will develop appropriate policies and procedures that provide for collecting and reporting such data to the SEC on an aggregated basis. The Designated Examining Authority will also develop policies and procedures reasonably designed to ensure the confidentiality of the non-aggregated data it receives from Market Makers. The data collection and reporting obligations are described below in Section VII.

V. Identification of Pilot Securities

(A) Criteria for Selection of Pilot Securities

Pilot Securities will consist of those NMS common stocks that satisfy the following criteria:

(1) A market capitalization of $[5]*3* billion or less on the last day of the Measurement Period, where market capitalization is calculated by multiplying the total number of shares outstanding on such day by the Closing Price of the security on such day;

(2) A Closing Price of at least $2.00 on the last day of the Measurement Period;

(3) A Closing Price on every U.S. trading day during the Measurement Period that is not less than $1.50;

(4) A Consolidated Average Daily Volume (''CADV'') during the Measurement Period of one million shares or less, where the CADV is calculated by adding the single-counted share volume of all reported transactions in the Pilot Security during the Measurement Period and dividing by the total number of U.S. trading days during the Measurement Period; and

(5) A Measurement Period Volume-Weighted Average Price (''Measurement Period VWAP'') of at least $2.00, where the Measurement Period VWAP is determined by calculating the VWAP for each U.S. trading day during the Measurement Period, summing the daily VWAP across the Measurement Period, and dividing by the total number of U.S. trading days during the Measurement Period.

For purposes of the CADV and Measurement Period VWAP calculations described in Sections V(A)(4) and V(A)(5), U.S. trading days during the Measurement Period with early closes will be excluded. An NMS common stock that had its initial public offering within six months of the start of the Pilot Period will not be eligible to be a Pilot Security.

(B) Grouping of Pilot Securities

The Operating Committee will oversee the Pilot Security grouping process in accordance with the methodology and criteria set out in this subsection. Once the population of Pilot Securities has been determined based on the criteria in Section V(A), the Operating Committee will select the Pilot Securities to be placed into three Test Groups by means of a stratified random sampling process. To effect this sampling, each of the Pilot Securities will be categorized as having (1) a low, medium, or high share price based on the Measurement Period VWAP, (2) low, medium, or high market capitalization based on the last day of the Measurement Period, and (3) low, medium, or high trading volume based on the CADV during the Measurement Period, yielding 27 possible categories. Low, medium, and high subcategories will be established by dividing the categories into three parts, each containing a third of the population.

Pilot Securities will be randomly selected from each of the 27 categories for inclusion into the Test Groups. If, however, a single category of Pilot Securities contains fewer than 10 securities, it will be combined with another of the 27 categories that contains at least 10 securities. If two or more categories of Pilot Securities contain fewer than 10 securities, those categories will be combined, provided the combined category contains at least 10 securities. If the combined category contains fewer than 10 securities, then the category will be combined with another of the 27 categories that contains at least 10 securities.

Pilot Securities will be randomly selected from each category for inclusion in the three Test Groups based on the percentage of Pilot Securities comprised of that category. As a result, each category will be represented in the three Test Groups based on its relative proportion to the population of Pilot Securities. Further, a primary listing market's securities will be selected from each category and included in the three Test Groups in the same proportion as that primary listing market's securities comprise each category of Pilot Securities. Each Test Group will consist of 400 Pilot Securities. Those Pilot Securities not placed into the three Test Groups will constitute the Control Group.

(C) Publication of Pilot Securities and Groups

Each primary listing exchange will make publicly available for free on its Web site a list of those Pilot Securities listed on that exchange and included in the Control Group and each Test Group, adjusting for ticker symbol changes and relevant corporate actions. The list of Pilot Securities will contain the data specified in Appendix A.

VI. Pilot Test Groups

As described in Section V(B), the Pilot Securities will be divided into four groups: a Control Group and three Test Groups. Each Test Group will consist of 400 Pilot Securities. The Control Group will consist of the Pilot Securities not placed into a Test Group.

(A) Control Group

Pilot Securities in the Control Group may be quoted and traded at any price increment that is currently permitted.

(B) Test Group One

Pilot Securities in Test Group One will be quoted in $0.05 minimum increments, but may continue to trade at any price increment that is currently permitted. Participants will adopt rules prohibiting Participants or any member of a Participant from displaying, ranking, or accepting from any person any displayable or non-displayable bids or offers, orders, or indications of interest in any Pilot Security in Test Group One in price increments other than $0.05. However, orders priced to execute at the midpoint and orders entered in a Participant-operated retail liquidity program may be ranked and accepted in increments of less than $0.05.

(C) Test Group Two

Pilot Securities in Test Group Two will be subject to the same quoting requirements as Test Group One, along with the applicable quoting exceptions. In addition, Pilot Securities in Test Group Two may only be traded in $0.05 minimum increments. Participants will adopt rules prohibiting trading centers operated by Participants and members of Participants from executing orders in any Pilot Security in Test Group Two in price increments other than $0.05. The $0.05 minimum trading increment applies to brokered cross trades. Pilot Securities in Test Group Two may trade in increments less than $0.05, however, under the following circumstances:

(1) Trading may occur at the midpoint between the National Best Bid and the National Best Offer or the midpoint between the best protected bid and the best protected offer;

(2) Retail Investor Orders may be provided with price improvement that is at least $0.005 better than the best protected bid or the best protected offer; and

(3) Negotiated Trades may trade in increments less than $0.05.

(D) Test Group Three

Pilot Securities in Test Group Three will be subject to the same quoting and trading requirements as Test Group Two, along with the applicable quoting and trading exceptions. In addition, Pilot Securities in Test Group Three will be subject to a trade-at prohibition.

Trade-at Prohibition. Under the trade-at prohibition, the Plan will (1) prevent a trading center that was not quoting from price-matching protected quotations and (2) permit a trading center that was quoting at a protected quotation to execute orders at that level, but only up to the amount of its displayed size.

In accordance with the trade-at prohibition, Participants will adopt rules prohibiting trading centers operated by Participants and members of Participants from executing a sell order for a Pilot Security at the price of a protected bid or from executing a buy order for a Pilot Security at the price of a protected offer unless such executions fall within an exception set forth below.

Trade-at Prohibition Exceptions. Trading centers will be permitted to execute an order for a Pilot Security at a price equal to a protected bid or protected offer under the following circumstances:

(1) The order is executed by a trading center that is displaying a quotation, via either a processor or an SRO quotation feed, at a price equal to the traded-at protected quotation but only up to the trading center's full displayed size [. Where the quotation is displayed through a national securities exchange, the execution at the size of the order must occur against the displayed size on that national securities exchange. Where the quotation is displayed through the Alternative Display Facility or another facility approved by the Commission that does not provide execution functionality, the execution at the size of the order must occur against the displayed size in accordance with the rules of the Alternative Display Facility or such approved facility];

(2) The order is of Block Size;

(3) The order is a Retail Investor Order executed with at least $0.005 price improvement;

(4) The order is executed when the trading center displaying the protected quotation that was traded at was experiencing a failure, material delay, or malfunction of its systems or equipment;

(5) The order is executed as part of a transaction that was not a ''regular way'' contract;

(6) The order is executed as part of a single-priced opening, reopening, or closing transaction by the trading center;

(7) The order is executed when a protected bid was priced higher than a protected offer in the Pilot Security;

(8) The order is identified as an Intermarket Sweep Order;

(9) The order is executed by a trading center that simultaneously routed Trade-at Intermarket Sweep Orders to execute against the full displayed size of the protected quotation that was traded at;

(10) The order is executed as part of a Negotiated Trade;

(11) The order is executed when the trading center displaying the protected quotation that was traded at had displayed, within one second prior to execution of the transaction that constituted the trade-at, a best bid or best offer, as applicable, for the Pilot Security with a price that was inferior to the price of the trade-at transaction.

(12) The order is executed by a trading center which, at the time of order receipt, the trading center had guaranteed an execution at no worse than a specified price (a ''stopped order''), where:

a. The stopped order was for the account of a customer;

b. The customer agreed to the specified price on an order-by-order basis; and

c. The price of the trade-at transaction was, for a stopped buy order, equal to the national best bid in the Pilot Security at the time of execution or, for a stopped sell order, equal to the national best offer in the Pilot Security at the time of execution; or

(13) The order is for a fractional share of a Pilot Security, provided that such fractional share order was not the result of breaking an order for one or more whole shares of a Pilot Security into orders for fractional shares or was not otherwise effected to evade the requirements of the trade-at prohibition or any other provisions of the Plan.

The following examples illustrate the basic operation of the trade-at prohibition:

Example 1

The NBBO for Pilot Security ABC is $20.00 × $20.10. Trading Center 1 is displaying a 100-share protected bid at $20.00. Trading Center 2 is displaying a 100-share protected bid at $19.95. There are no other protected bids. Trading Center 3 is not displaying any shares in Pilot Security ABC but has 100 shares hidden at $20.00 and has 100 shares hidden at $19.95. Trading Center 3 receives an incoming order to sell for 400 shares. To execute the 100 shares hidden at $20.00, Trading Center 3 must respect the protected bid on Trading Center 1 at $20.00. Trading Center 3 must route a Trade-at Intermarket Sweep Order to Trading Center 1 to execute against the full displayed size of the protected bid, at which point Trading Center 3 is permitted to execute against the 100 shares hidden at $20.00. To execute the 100 shares hidden at $19.95, Trading Center 3 must respect the protected bid on Trading Center 2 at $19.95. Trading Center 3 must route a Trade-at Intermarket Sweep Order to Trading Center 2 to execute against the full displayed size of the protected bid, at which point Trading Center 3 is permitted to execute against the 100 shares hidden at $19.95.

Example 2

The NBBO for Pilot Security ABC is $20.00 × $20.10. Trading Center 1 is displaying a 100-share protected bid at $20.00. Trading Center 2 is displaying a 100-share protected bid at $20.00. Trading Center 2 also has 300 shares hidden at $20.00 and has 300 shares hidden at $19.95. Trading Center 3 is displaying a 100-share protected bid at $19.95. There are no other protected bids. Trading Center 2 receives an incoming order to sell for 900 shares. Trading Center 2 may execute 100 shares against its full displayed size at the protected bid at $20.00. To execute the 300 shares hidden at $20.00, Trading Center 2 must respect the protected bid on Trading Center 1 at $20.00. Trading Center 2 must route a Trade-at Intermarket Sweep Order to Trading Center 1 to execute against the full displayed size of Trading Center 1's protected bid, at which point Trading Center 2 is permitted to execute against the 300 shares hidden at $20.00. To execute the 300 shares hidden at $19.95, Trading Center 2 must respect the protected bid on Trading Center 3 at $19.95. Trading Center 2 must route a Trade-at Intermarket Sweep Order to Trading Center 3 to execute against the full displayed size of Trading Center 3's protected bid, at which point Trading Center 2 is permitted to execute against the 300 shares hidden at $19.95.

Example 3

The NBBO for Pilot Security ABC is $20.00 × $20.10. Trading Center 1 is displaying a 100-share protected bid at $20.00. Trading Center 1 is also displaying 300 shares at $19.90 on an SRO quotation feed. Trading Center 2 is displaying a 100-share protected bid at $19.95. Trading Center 2 is also displaying 200 shares at $19.90 on an SRO quotation feed and has 200 shares hidden at $19.90. Trading Center 3 is displaying a 100-share protected bid at $19.90. There are no other protected bids. Trading Center 2 receives an incoming order to sell for 700 shares. To execute against its protected bid at $19.95, Trading Center 2 must comply with the trade-through restrictions in Rule 611 of Regulation NMS and route an intermarket sweep order to Trading Center 1 to execute against the full displayed size of Trading Center 1's protected bid at $20.00. Trading Center 2 is then permitted to execute against its 100-share protected bid at $19.95. Trading Center 2 may then execute 200 shares against its full displayed size at the price of Trading Center 3's protected bid. To execute the 200 shares hidden at $19.90, Trading Center 2 must respect the protected bid on Trading Center 3 at $19.90. Trading Center 2 must route a Trade-at Intermarket Sweep Order to Trading Center 3 to execute against the full displayed size of Trading Center 3's protected bid, at which point Trading Center 2 is permitted to execute against the 200 shares hidden at $19.90. Trading Center 2 does not have to respect Trading Center 1's displayed size at $19.90 for trade-at purposes because it is not a protected quotation.

VII. Collection of Pilot Data

(A) Collection of Trading Center Pilot Data

Throughout the Pilot Period, the Participants will collect the following data with respect to Pilot Securities (as set forth in Appendix B):

(1) Daily market quality statistics of orders by security, order type, original order size (as observed by the trading center), hidden status (as applicable), and coverage under Rule 605 of Regulation NMS;

(2) Specified data regarding market orders and marketable limit orders;

(3) Daily number of registered Market Makers; and

(4) Daily Market Maker participation statistics. Each Participant that is the Designated Examining Authority of a member of a Participant operating a trading center will require such member to collect and provide to the Designated Examining Authority the data described in subparagraphs (1) and (2) above, as applicable, subject to the terms and conditions in Appendix B. The Participants and each member of a Participant operating a trading center will also be required to collect such data for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. Each Participant will make available to other Participants a list of members designated as Market Makers on that Participant's trading center.

On a monthly basis, the Participants and the Designated Examining Authority for each member of a Participant operating a trading center will make the data in the applicable subparagraphs specified above publicly available on their Web sites for free and will report such data to the SEC on a disaggregated basis by trading center. The data made publicly available will not identify the trading center that generated the data.

(B) Collection of Market Maker Profitability Data

Each Participant that is the Designated Examining Authority of a Market Maker will require such Market Maker to provide to the Designated Examining Authority the data specified in Appendix C regarding daily Market Maker trading profits with respect to Pilot Securities on a monthly basis. Each Market Maker will also be required to provide to its Designated Examining Authority such daily data for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. On a monthly basis, the Designated Examining Authority will aggregate such data related to Market Makers *categorized by the Control Group and each Test Group* and make the aggregated data publicly available on its Web site for free and will report such data to the SEC*, provided, however, the data reported to the SEC shall include the profitability statistics categorized by security.* The data made publicly available will not identify the Market Makers that generated the data *or the individual securities.*

VIII. Assessment of Pilot

No later than [six] *eighteen* months after the [end] *start* of the Pilot Period, the Participants will provide to the Commission and make publicly available a joint assessment of the impact of the Pilot. *The assessment will be conducted using data generated during the first twelve months of the Pilot Period, or a subset of which that represents the impact of the Pilot.* The assessment will include:

(1) An assessment of the statistical and economic impact of an increase in the quoting increment on market quality;

(2) An assessment of the statistical and economic impact of an increase in the quoting increment on the number of Market Makers;

(3) An assessment of the statistical and economic impact of an increase in the quoting increment on Market Maker participation;

(4) An assessment of the statistical and economic impact of an increase in the quoting increment on Market Maker profits;

([4]*5*) An assessment of the statistical and economic impact of an increase in the quoting increment on market transparency;

([5]*6*) An evaluation whether any market capitalization, daily trading volume, or other thresholds can differentiate the results of the above assessments across stocks *(e.g.,* does the quoting increment impact differently those stocks with daily trading volume below a certain threshold);

([6]*7*) An assessment of the statistical and economic impact of the above assessments for the incremental impact of a trading increment and for the joint effect of an increase in a quoting increment with the addition of a trading increment;

([7]*8*) An assessment of the statistical and economic impact of the above assessments for the incremental impact of a trade-at prohibition and for the joint effect of an increase in a quoting increment with the addition of a trading increment and a trade-at prohibition; and

(8) An assessment of any other economic issues that the Participants believe the SEC should consider in any rulemaking that may follow the Pilot. Participants may individually submit to the SEC and make publicly available additional supplemental assessments of the impact of the Pilot.

IX. Implementation

The Tick Size Pilot Program will be implemented on a [one]*two*-year pilot basis. The Tick Size Pilot Program will be applicable during and outside of Regular Trading Hours.

X. Withdrawal from Plan

If a Participant obtains SEC approval to withdraw from the Plan, such Participant may withdraw from the Plan at any time on not less than 30 days' prior written notice to each of the other Participants. At such time, the withdrawing Participant will have no further rights or obligations under the Plan.

XI. Counterparts and Signatures

The Plan may be executed in any number of counterparts, no one of which need contain all signatures of all Participants, and as many of such counterparts as will together contain all such signatures will constitute one and the same instrument.

IN WITNESS THEREOF, this Plan has been executed as of the __day of __ [2014] *2015* by each of the parties hereto.

BATS EXCHANGE, INC.
BY: ____________________

BATS Y–EXCHANGE, INC.
BY: ____________________

CHICAGO STOCK EXCHANGE, INC.
BY: ____________________

EDGA EXCHANGE, INC.
BY: ____________________

EDGX EXCHANGE, INC.
BY: ____________________

FINANCIAL INDUSTRY REGULATORY AUTHORITY, INC.
BY: ____________________

NASDAQ OMX BX, INC.
BY: ____________________

NASDAQ OMX PHLX LLC
BY: ____________________

THE NASDAQ STOCK MARKET LLC
BY: ____________________

NEW YORK STOCK EXCHANGE LLC
BY: ____________________

NYSE MKT LLC
BY: ____________________

NYSE ARCA, INC.
BY: ____________________

Appendix A—Publication of Pilot Securities

The following data will be made publicly available in a pipe delimited format regarding the list of Pilot Securities included in the Control Group and each Test Group. Each primary listing exchange will be responsible for making publicly available for free on its Web site the following data with respect to the Pilot Securities listed on that exchange and included in the Control Group and each Test Group.

I. Identification of Pilot Securities

a. Ticker Symbol
b. Security Name
c. Listing Exchange
d. Date
e. Tick Size Pilot Program Group- character value of
i. ''C'' for Pilot Securities in the Control Group
ii. ''G1'' for Pilot Securities in Test Group One
iii. ''G2'' for Pilot Securities in Test Group Two
iv. ''G3'' for Pilot Securities in Test Group Three

II. Change in Pilot Securities' Ticker Symbols

a. Ticker Symbol
b. Security Name
c. Listing Exchange
d. Effective Date
e. Deleted Date
f. Tick Size Pilot Program Group—character value of
i. ''C'' for Pilot Securities in the Control Group
ii. ''G1'' for Pilot Securities in Test Group One
iii. ''G2'' for Pilot Securities in Test Group Two
iv. ''G3'' for Pilot Securities in Test Group Three
g. Old Ticker Symbol(s)
h. Reason for the change

Appendix B—Data Collected by Participants and Trading Centers

Each Participant, as applicable, will collect and transmit the data described in Items I–IV with respect to Pilot Securities to the SEC in a pipe delimited format on a monthly basis. In addition, each Participant that is the Designated Examining Authority of a member of a Participant operating a trading center will require such member, as applicable, to collect and transmit the data described in Items I and II with respect to Pilot Securities to the Designated Examining Authority in a pipe delimited format on a monthly basis. Each Designated Examining Authority will transmit the data on a disaggregated basis to the SEC, *i.e.,* by trading center. The data will be provided to the SEC within 30 calendar days following month end. All trading centers, including Participants, will report the data described in Items I.a(28) and I.b with respect to only those orders executed, in whole or part, on that trading center. All trading centers will report the remaining data described in Items I.a with respect to any order received by that trading center. The data described in Item I will only be collected for orders received during Regular Trading Hours. All trading centers, including Participants, will report the data described in Item II with respect to any market or marketable limit orders received by that trading center. The data described in Item II will be collected for orders received during and outside of Regular Trading Hours. Orders entered while a trading halt is in effect will be excluded from the data. The data will be provided for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period.

I. Market Quality Statistics—Daily market quality statistics categorized by security, order type, original order size, hidden status, and coverage under Rule 605, including the following columns of information:

a. For regular hours orders which are market orders (10), marketable limit orders (11), inside-the-quote resting limit orders (12), at-the-quote resting limit orders (13), near-the-quote resting limit orders (within .10 from the NBBO) (14), resting intermarket sweep orders (15), retail liquidity providing orders (16), and midpoint passive liquidity orders (17) executed on the trading center:

(1) Exchange code or trading center identifier;

(2) Ticker Symbol;

(3) Order Type, as defined in the Plan or in I.a of this Appendix;

(4) Original Order size with the following modified categories from Rule 605 reports:

a. Less than 100 shares;
b. 100 to 499 shares;
c. 500 to 1999 shares;
d. 2000 to 4999 shares;
e. 5000 to 9999 shares; and
f. 10000 or more shares;

(5) Hidden Status Category—indicates whether the orders fall into the following categories:

a. Entirely Displayable;
b. Partially Displayable; and
c. Not Displayable;

(6) Rule 605 Coverage—indicates whether the orders are covered in Rule 605 (Y/N);

(7) The cumulative number of orders;

(8) The cumulative number of shares of orders;

(9) The cumulative number of shares of orders canceled;

(10) The cumulative number of shares of orders executed on the receiving trading center;

(11) The cumulative number of orders with special handling instructions (for example, slide, discretion, eligible counterparty, minimum quantity) excluded from price improvement and effective spread statistics;

(12) The cumulative number of shares of orders with special handling instructions (for example slide, discretion, eligible counterparty, minimum quantity) excluded from price improvement and effective spread statistics;

(13) The cumulative number of shares of orders executed at any other trading center;

(14) The cumulative number of shares of orders executed from 0 to less than 100 microseconds after the time of order receipt;

(15) The cumulative number of shares of orders executed from 100 microseconds to less than 100 milliseconds after the time of order receipt;

(16) The cumulative number of shares of orders executed from 100 milliseconds to less than 1 second after the time of order receipt;

(17) The cumulative number of shares of orders executed from 1 second to less than 30 seconds after the time of order receipt;

(18) The cumulative number of shares of orders executed from 30 seconds to less than 60 seconds after the time of order receipt;

(19) The cumulative number of shares of orders executed from 60 seconds to less than 5 minutes after the time of order receipt;

(20) The cumulative number of shares of orders executed from 5 minutes to 30 minutes after the time of order receipt;

(21) The cumulative number of shares of orders canceled from 0 to less than 100 microseconds after the time of order receipt;

(22) The cumulative number of shares of orders canceled from 100 microseconds to less than 100 milliseconds after the time of order receipt;

(23) The cumulative number of shares of orders canceled from 100 milliseconds to less than 1 second after the time of order receipt;

(24) The cumulative number of shares of orders canceled from 1 second to less than 30 seconds after the time of order receipt;

(25) The cumulative number of shares of orders canceled from 30 seconds to less than 60 seconds after the time of order receipt;

(26) The cumulative number of shares of orders canceled from 60 seconds to less than 5 minutes after the time of order receipt;

(27) The cumulative number of shares of orders canceled from 5 minutes to 30 minutes;

(28) The share-weighted average realized spread for executions of orders;

(29) Original Percentage Hidden—the received share-weighted average percentage of shares not displayable as of order receipt;

(30) Final Percentage Hidden—the received share-weighted average percentage of shares not displayed prior to final order execution or cancellation;

(31) Quoted Size at the National Best Bid and National Best Offer -the share weighted average of the consolidated quoted size at the inside price at the time of order execution;

(32) Share-weighted average NBBO Spread at the time of order execution; and

(33) Share-weighted average BBO Spread of reporting exchange at the time of order execution.

b. For market orders and marketable limit orders, except those noted as excluded:

(1) The share-weighted average effective spread for executions of orders;

(2) The cumulative number of shares of orders executed with price improvement;

(3) For shares executed with price improvement, the share-weighted average amount per share that prices were improved;

(4) For shares executed with price improvement, the share-weighted average period from the time of order receipt to the time of order execution;

(5) The cumulative number of shares of orders executed at the quote;

(6) For shares executed at the quote, the share-weighted average period from the time of order receipt to the time of order execution;

(7) The cumulative number of shares of orders executed outside the quote;

(8) For shares executed outside the quote, the share-weighted average amount per share that prices were outside the quote; and

(9) For shares executed outside the quote, the share-weighted average period from the time of order receipt to the time of order execution.

II. Market and Marketable Limit Order Data—The following columns of information with respect to Market Orders and non-booked portions of Marketable Limit Orders:

a. Exchange code or trading center identifier;

b. Ticker Symbol;

c. Date;

d. Time of order receipt;

e. Order Type;

f. Order Size in Shares;

g. Order side- ''B'', ''S'' (including sell short exempt), ''SS'';

h. Order price (if marketable limit);

i. NBBO quoted price;

j. NBBO quoted depth in lots;

k. Receiving market offer for buy or bid for sell (as applicable);

l. Receiving market depth (offer for buy and bid for sell) (as applicable);

m. ISO flag (Y/N);

n. Retail Investor Order flag (Y/N);

o. Routable flag (Y/N);

p. IOC (Y/N);

q. Indicator for quote leader- ''1'' if the receiving market is the first market to post the NBB for a sell or NBO for a buy (as applicable);

r. Average execution price-share-weighted average that includes only executions on the receiving market;

s. Average execution time-share-weighted average period that includes only executions on the receiving market;

t. Executed shares-the number of shares in the order that are executed;

u. Canceled shares—the number of shares in the order that are canceled;

v. Routed shares-the number of shares in the order that are routed to another exchange or market;

w. Routed average execution price-share-weighted average that includes only shares routed away from the receiving market;

x. Average routed execution time-share-weighted average period that includes only executions on the routed markets; and

y. Indicator for special handling instructions (for example, slide, discretion, eligible counterparty, minimum quantity)-identifies orders that contain instructions that could result in delayed execution or an execution price other than the quote.

III. Daily Market Maker Registration Statistics—Each Participant that is a National Securities Exchange will collect daily Market Maker registration statistics categorized by security, including the following columns of information:

a. Ticker Symbol;

b. SRO;

c. Number of registered market makers; and

d. Number of other registered liquidity suppliers.

IV. Daily Market Maker Participation Statistics—Each Participant will collect daily Market Maker participation statistics with respect to each Market Maker engaging in trading activity on the trading center operated by the Participant. With respect to each Market Maker, the Participant will collect such statistics irrespective of whether the Market Maker is registered with the Participant. The participation statistics will be categorized by security, including the columns of information listed below, except that a Participant that is a national securities association will not be required to collect such statistics unless a Market Maker registers with its Alternative Display Facility prior to or during the Pilot Period:

a. Ticker Symbol;

b. Share participation—the number of shares purchased or sold by Market Makers in a principal trade, not including riskless principal. When aggregating across Market Makers, share participation will be an executed share-weighted average per Market Maker;

c. Trade participation—the number of purchases and sales by Market Makers in a principal trade, not including riskless principal. When aggregating across Market Makers, trade participation will be a trade-weighted average per Market Maker;

d. Cross-quote share (trade) participation-the number of shares purchased (the number of purchases) at or above the NBO and the number of shares sold (the number of sales) at or below the NBB at the time of the trade;

e. Inside-the-quote share (trade) participation-the number of shares purchased (the number of purchases) and the number of shares sold (the number of sales) between the NBBO at the time of the trade;

f. At-the-quote share (trade) participation-the number of shares purchased (the number of purchases) that are equal to the National Best Bid price and the number of shares sold (the number of sales) that are equal to the National Best Offer price at the time of or immediately before the trade. In the case of a downward moving National Best Bid or Offer, the National Best Bid or National Best Offer price immediately before the trade will be used; and

g. Outside-the-quote share (trade) participation-the number of shares purchased (the number of purchases) that are less than the National Best Bid price and the number of shares sold (the number of sales) that are greater than the National Best Offer price at the time of or immediately before the trade. In the case of a downward moving National Best Bid or Offer, the National Best Bid or National Best Offer price immediately before the trade will be used.

Appendix C—Data Collected by Market Makers

Each Participant that is the Designated Examining Authority of a Market Maker will require such Market Maker to collect the data described in Item I with respect to orders and executions in Pilot Securities on any trading center and to transmit such data in a pipe delimited format to the Designated Examining Authority on a monthly basis, to be provided within 30 calendar days following month end. Data will only be collected with respect to those orders and executions occurring during Regular Trading Hours. The data will be provided for dates starting six months prior to the Pilot Period through six months after the end of the Pilot Period. Each Designated Examining Authority will be responsible for aggregating the data provided by the Market Makers under Item I and providing the data described in Item II in a pipe delimited format to the SEC.

I. Market Maker Profitability—Daily Market Maker profitability statistics categorized by security, including the following columns of information:

a. Total number of shares of orders executed by the Market Maker;

b. Raw Market Maker realized trading profits—the difference between the market value of Market Maker sales (shares sold x price) and the market value of Market Maker purchases (shares purchased x price). A LIFO-like method will be used for determining which share prices to use in the calculation; and

c. [Market Maker realized trading profits net of fees and rebates—realized trading profits plus rebates the Market Maker collects from trading on that day minus access fees the Market Maker pays for trading on that day (if estimated before allocation of rebates and fees, use expected rebates and fees); and]

[d.] Raw Market Maker unrealized trading profits—the difference between the purchase or sale price of the end-of-day inventory position of the Market Maker and the Closing Price. In case of a short position, the Closing Price from the sale will be subtracted. In the case of a long position, the purchase price will be subtracted from the Closing Price.

II. Aggregated Market Maker Profitability—Total Daily Market Maker profitability statistics categorized by security *as well as categorized by the Control Group and each Test Group,* including the following columns of information:

a. Total Raw Market Maker realized trading profits—the difference between the market value of Market Maker sales (shares sold x price) and the market value of Market Maker purchases (shares purchased x price). A LIFO-like method will be used for determining which share prices to use in the calculation;

b. Volume-weighted average of Raw Market Maker realized trading profits;

[c. Total Market Maker realized trading profits net of fees and rebates—realized trading profits plus rebates the Market Maker collects from trading on that day minus access fees the Market Maker pays for trading on that day (if estimated before allocation of rebates and fees, use expected rebates and fees);

d. Volume-weighted average of Market Maker realized trading profits net of fees and rebates;]

c.[e.] Total Raw Market Maker unrealized trading profits—the difference between the purchase or sale price of the end-of-day inventory position of the Market Maker and the Closing Price. In case of a short position, the Closing Price from the sale will be subtracted. In the case of a long position, the purchase price will be subtracted from the Closing Price; and

d.[f.] Volume-weighted average of Market Maker unrealized trading profits.

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