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SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-72460)

June 24, 2014

Order Directing the Exchanges and the Financial Industry Regulatory Authority to Submit a Tick Size Pilot Plan

Notice is hereby given that, pursuant to Section 11A(a)(3)(B) of Securities Exchange Act of 1934 (“Act”),¹ the Securities and Exchange Commission (“Commission”) orders the BATS Exchange, Inc., BATS Y-Exchange, Inc., Chicago Stock Exchange, Inc., EDGA Exchange, Inc., EDGX Exchange, Inc., The Nasdaq Stock Market LLC, Nasdaq OMX BX, Nasdaq OMX Phlx, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE Arca, Inc., NYSE MKT LLC, and Financial Industry Regulatory Authority, Inc. (“FINRA”) (collectively the “Participants” and individually a “Participant”) to act jointly in developing and filing with the Commission a national market system plan to implement a pilot program that, among other things, would widen the quoting and trading increments for certain small capitalization stocks as described in detail below (“Tick Size Pilot Plan”). The Tick Size Pilot Plan should be filed with the Commission pursuant to Rule 608 under the Act² no later than August 25, 2014.

I. Background

Prior to implementing decimal pricing in April 2001, the U.S. equity markets used fractions as minimum pricing increments. In the 1990s, the Commission began to re-examine

¹ Section 11A(a)(3)(B) authorizes the Commission, in furtherance of its statutory directive to facilitate the establishment of a national market system, 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 [the Act] in planning, developing, operating, or regulating a national market system (or a subsystem thereof) or one or more facilities thereof.” 15 U.S.C. 78k-1(a)(3)(B).

² 17 CFR 242.608.

the fractional pricing structure, and in 1994, the Commission staff issued a report (the “Market 2000 Report”) on the equities markets that, among other things, expressed concern that the then-existing $1/8^{\text{th}}$ of a dollar minimum pricing increment was “caus[ing] artificially wide spreads and hinder[ing] quote competition,” leading to excessive profits for market makers.³ In the Market 2000 Report, the Commission staff also expressed concern that fractional pricing put the U.S. equity markets at a competitive disadvantage to foreign equity markets that used decimal pricing increments. The Commission used these findings as part of a public discussion on whether the U.S. equity markets should adopt a lower fractional minimum tick size or adopt decimal pricing.

At the same time, the exchanges and NASDAQ (the predecessor to The Nasdaq Stock Market LLC) began to implement lower tick sizes, generally to $1/16^{\text{th}}$ of \$1.00.⁴ The Commission, the exchanges and NASDAQ believed that the reductions in tick size would provide multiple benefits to the equity markets, including better pricing and greater liquidity.

In January 2000, the Commission ordered the exchanges and NASD (the predecessor to FINRA) to submit a decimalization plan that would implement decimal pricing in certain

³ See Securities and Exchange Commission, Market 2000: An Examination of Current Equity Market Developments (1994).

⁴ See Securities Exchange Act Release Nos. 31118 (August 28, 1992), 57 FR 40484 (September 3, 1992) (SR-Amex-91-07) (Order approving proposed rule change relating to amendments to rule 127-minimum fractional changes); 38571 (May 5, 1997), 62 FR 25682 (May 9, 1997) (SR-Amex-97-14) (Order granting approval to proposed rule change relating to trading in $1/16^{\text{th}}$ of \$1.00); 38897 (August 1, 1997), 62 FR 42847 (August 8, 1997) (SR-NYSE-97-21) (Order granting approval to proposed rule change relating to trading differentials for equity securities); 38678 (May 27, 1997) 62 FR 30363 (June 3, 1997) (SR-NASD-97-27) (Order granting approval to proposed rule change to decrease the minimum quotation increment for certain securities listed and traded on The NASDAQ Stock Market to $1/16^{\text{th}}$ of \$1.00). These tick sizes were not binding on other markets. Some electronic communication networks (ECNs) allowed prices in increments of $1/256^{\text{th}}$ of \$1.00. See also Securities Exchange Act Release No. 44568, 66 FR 38390, 38392 (July 24, 2001) (Request for Comment on the Effects of Decimal Trading in Subpennies).

securities by July 2000.⁵ Throughout 2000, the Commission and the self-regulatory organizations (“SROs”) worked to phase-out fractional pricing and phase-in decimal pricing.⁶ The conversion to decimal pricing was completed in April 2001.⁷ These actions reduced the allowable tick size to a penny but did not mandate a minimum tick size.

In 2004, the Commission proposed, and then re-proposed, Rule 612 of Regulation NMS to establish a minimum price variation (“MPV”) of one penny.⁸ Several commenters on the original proposal had recommended an MPV of greater than one penny. In response, the Commission noted that proposed Rule 612 would “set a floor for the MPV, not determine an optimal MPV.”⁹ The Commission further stated that the conversion to decimal pricing had “reduced spreads, thus resulting in reduced trading costs for investors entering orders – particularly for smaller orders – that are executed at or within the quotations,”¹⁰ and because of these benefits the Commission did not propose a higher MPV. It added, however, that “if the SROs in the future believe that an increase in the MPV is necessary or desirable, they may

⁵ See Securities Exchange Act Release No. 42360 (January 28, 2000), 65 FR 5003 (February 2, 2000) (“January Order”).

⁶ In April 2000, the Commission issued an order staying the deadlines set forth in the January Order and issued a notice requesting comment on two alternatives for implementing decimalization. See Securities Exchange Act Release No. 42685 (April 13, 2000), 65 FR 21046 (April 19, 2000). In June, the Commission issued another order that directed the exchanges and NASD to submit a plan to phase-in decimal pricing starting in September 2000, which was to be completed by April 2001. See Securities Exchange Act Release No. 42914 (June 8, 2000), 65 FR 38010 (June 19, 2000).

⁷ The exchanges and NASD submitted a plan, started the phase-in on time and finished implementing decimalization by April 2001. See Commission Notice: Decimals Implementation Plan for the Equities and Options Markets (July 24, 2000), available at <http://www.sec.gov/rules/other/decimalp.htm>.

⁸ See Securities Exchange Act Release No. 50870 (December 16, 2004), 69 FR 77424 (December 27, 2004) (Regulation NMS proposing release).

⁹ Id. at 77458.

¹⁰ Id.

propose rule changes to institute the higher MPV”¹¹ and that the Commission would evaluate them at that time. In 2005, the Commission adopted Regulation NMS Rule 612, and since that time the one penny MPV has applied to all listed stocks priced at \$1.00 or more per share.¹²

Since the adoption of Regulation NMS, the Commission has continued to evaluate tick sizes in the equity markets.¹³ In January 2010, the Commission issued a Concept Release, which requested comments on issues, including high frequency trading, order routing, market data linkages, and undisplayed liquidity.¹⁴ In the discussion on undisplayed liquidity, the Commission requested comments on whether public price discovery and execution quality have suffered, and specifically questioned whether the minimum pricing increment for lower priced stocks should be reduced, noting that broker-dealers may have greater incentives to internalize low-priced stocks than higher priced stocks, given the relatively larger minimum spreads that could be earned by broker-dealers. In response, the Commission received several letters

¹¹ Id.

¹² Rule 612 specifies minimum pricing increments for NMS stocks. In general, Rule 612 prohibits market participants from displaying, ranking, or accepting quotations, orders, or indications of interest in any NMS stock priced in an increment smaller than \$0.01 if the quotation, order, or indication of interest is priced equal to or greater than \$1.00 per share. If the quotation, order, or indication of interest is priced less than \$1.00 per share, the minimum pricing increment is \$0.0001. 17 CFR 242.612. An NMS stock means any security or class of securities, other than an option, for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan. See 17 CFR 242.600(b)(46) and (47).

¹³ In addition, the Commission has evaluated tick sizes in the options market and has approved a penny pilot program in the options markets. See e.g., Securities and Exchange Act Release Nos. 55153 (January 23, 2007), 72 FR 4553 (January 31, 2007) (SR-Phlx-2006-74); 55154 (January 23, 2007), 72 FR 4743 (February 1, 2007) (SR-CBOE-2006-92); 55155 (January 23, 2007), 72 FR 4741 (February 1, 2007) (SR-BSE-2006-49); 55156 (January 23, 2007), 72 FR 4759 (February 1, 2007) (SR-NYSEArca-2006-73); 55161 (January 24, 2007), 72 FR 4754 (February 1, 2007) (SR-ISE-2006-62); and 55162 (January 24, 2007), 72 FR 4738 (February 1, 2007) (SR-Amex-2006-106).

¹⁴ See Securities Exchange Act Release No. 61358 (January 14, 2010), 75 FR 3594 (January 21, 2010) (“Concept Release”).

opposing¹⁵ and supporting¹⁶ a pilot program to test sub-penny tick increments. The Commission also received letters recommending a pilot program to test a wider variety of tick sizes.¹⁷

From time to time since the introduction of decimal pricing, concerns have been raised that the one penny MPV may be detrimental to small- and middle-sized companies. In

¹⁵ See, e.g., Letters from Karrie McMillan, General Counsel, Investment Company Institute, dated April 21, 2010; Ann Vlcek, Managing Director and Associate General Counsel, Securities Industry and Financial Markets Association, dated April 29, 2010; James J. Angel, Associate Professor, McDonough School of Business, Georgetown University; Lawrence E. Harris, Fred V. Keenan Chair in Finance, Professor of Finance and Business Economics, Marshall School of Business, University of Southern California; Chester S. Spatt, Pamela R. and Kenneth B. Dunn Professor of Finance, Director, Center for Financial Markets, Tepper School of Business, Carnegie Mellon University, dated February 23, 2010.

¹⁶ See, e.g., Letters from Eric Swanson, General Counsel, BATS Exchange, Inc., dated April 21, 2010 and Eric W. Hess, General Counsel, Direct Edge, dated April 28, 2010.

¹⁷ See, e.g., Letters from Janet M. Kissane, SVP – Legal and Corporate Secretary, Office of the General Counsel, NYSE Euronext, dated April 23, 2010; and John A. McCarthy, General Counsel, GETCO LLC, Christopher R. Concannon, Partner, Virtu Financial LLC, and Leonard J. Amoruso, General Counsel, Knight Capital Group, Inc., dated July 9, 2010. In addition, in April 2010, BATS Exchange, Inc., NASDAQ OMX Group, Inc., and NYSE Euronext, Inc. petitioned the Commission to exercise its exemptive authority under Rule 612(c) of Regulation NMS to implement a pilot program that would permit market participants to display, rank, or accept from any person, a bid or offer or order in a tick increment smaller than \$0.01. See Letter from Chris Isaacson, Chief Operating Officer, BATS Exchange, Inc., Eric Noll, Executive Vice President, NASDAQ OMX Group, Inc., and Larry Leibowitz, Chief Operating Officer, NYSE Euronext, Inc. to Elizabeth M. Murphy, Secretary, Commission, dated on April 30, 2010 (“BATS/NASDAQ/NYSE Letter”) and available at <http://www.sec.gov/spotlight/regnms/jointnmsexemptionrequest043010.pdf>. The petitioners stated their belief that the \$0.01 MPV has resulted in artificially wide publicly-displayed quotes for certain lower-priced, liquid securities, which has negatively impacted the public price discovery process and resulted in inferior execution prices for investors. The petitioners requested the Commission to implement a six-month pilot program to permit sub-penny quoting at \$0.005 in certain securities trading between \$1.00 and \$20.00 (the securities are listed on the Appendix to the petitioners’ letter and included an exchange-traded fund (QQQQ), which trades at a price greater than \$20.00). The petitioners stated their belief that allowing a smaller MPV for certain lower-priced, but liquid, securities would allow competitive market forces to better reflect an approximation of a stock’s value.

particular, a few studies have 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 of smaller companies.¹⁸

In 2012, Congress passed the Jumpstart Our Business Startups Act (“JOBS Act”), which contained provisions relating to the impact of decimalization on small and middle capitalization companies. Specifically, Section 106(b) of the JOBS Act 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 smaller capitalization company securities. The Commission submitted the staff study to Congress in the July 2012 Decimalization Report.¹⁹

The Decimalization Report summarized the academic literature relating to the impact of decimalization on the market generally, and on the securities of small and middle capitalization companies. The Commission staff noted that there were no academic papers that directly examined the relationship between decimalization and the number of IPOs. The academic studies summarized in the Decimalization Report analyzed decimalization’s impact on spreads, depth, execution speed, trade size, specialist/market maker participation and profitability, market and limit orders, order routing, volatility, and incentives for broker promotion. The Decimalization Report identified the main empirical findings of the academic literature in each of these areas. For example, some studies found that while both effective and quoted spreads declined after decimalization, there is some evidence that, at least for NASDAQ small

¹⁸ For a complete discussion of these studies see *Report to Congress on Decimalization* (July 2012) available at <http://www.sec.gov/news/studies/2012/decimalization-072012.pdf> (“Decimalization Report”).

¹⁹ See *id.*

capitalization stocks, the decline is not statistically significant, and the effect of decimalization on institutional transaction costs is mixed. In addition, some studies found that while quoted depth, on average, declined after decimalization, cumulative depth at competitive prices did not change. Some studies found that market maker participation increased after decimalization across all market capitalization categories, but decimalization does not appear to have reduced profitability.

In the Decimalization Report, the Commission staff also surveyed tick-size conventions in non-U.S. markets. Many foreign jurisdictions utilize a tiered tick size approach that provides greater variability for tick sizes based on the price level of a stock rather than the “one size fits all” approach utilized in the United States. Many countries have tick sizes that are four or more times wider than in the U.S. on a percentage basis. However, a few other countries have tick sizes that are less than half the size of the U.S. on a percentage basis. Therefore, the Decimalization Report stated that the U.S. market would benefit from a broad review of tick sizes, and such review would be informed by the experiences in other countries.²⁰

Finally, the Decimalization Report considered the panel discussion that occurred during the meeting of the SEC Advisory Committee on Small and Emerging Companies (“Small Company Advisory Committee”)²¹ in June 2012 that related to market structure issues and their impact on small and middle capitalization companies and on IPOs. In particular, some Small

²⁰ See Decimalization Report at 18. The Decimalization Report also examined the level of small company IPOs in other countries during the time before and after decimalization to assess whether other countries had experienced declines in small company IPOs like the U.S. experienced. An examination of other countries’ IPO activities did not show a decline like that experienced in the U.S., even in those countries that have smaller tick sizes.

²¹ More information on the committee is available at <http://www.sec.gov/info/smallbus/acsec.shtml>.

Company Advisory Committee members commented that it may be hard to isolate the impact of decimalization on small company IPOs from other concurrent factors, such as the enactment of the Sarbanes-Oxley Act in 2002, the Global Analyst Research Settlement in 2003, and the emergence of high frequency trading and dark pools. As discussed further below, the Small Company Advisory Committee continued to evaluate the issues raised by decimalization and its impact on small capitalization companies, and issued recommendations in February 2013.²²

While 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 small capitalization companies, it did recommend that the Commission continue to study this area. The Decimalization Report specifically 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. On February 5, 2013, the Commission staff held a Decimalization Roundtable with participation from a wide range of market participants, academics, and others. Many of the panelists were of the view that factors other than decimalization were more significant factors in the decline in IPOs in recent years. While views differed 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 small capitalization companies.²³ This view was reflected in comment letters submitted to the Commission in

²² See note 26 *infra*.

²³ There was some discussion at the Roundtable about the BATS/NASDAQ/NYSE Letter, which requested the implementation of a sub-penny pilot, *see supra* note 17. See also letter from Chris Isaacson, SVP & COO and Eric Swanson, Secretary, BATS Global Markets to Elizabeth M. Murphy, Secretary, Commission, dated January 29, 2013). In general, some panelists suggested that adding narrower ticks to a pilot could

advance of the Roundtable.²⁴ Some panelists, however, expressed concern about the potential costs to investors of wider minimum tick sizes.²⁵

counterbalance the negative issues related to the potentially increased costs to investors for the widening of spreads in small stocks. However, panelists noted that institutional investors and issuers were not supportive of narrower tick sizes and one panelist suggested that any pilot should be limited to the small cap issuers to keep it simple and targeted for the market.

²⁴ See e.g. letters from Chris Isaacson, SVP & COO, and Eric Swanson, Secretary, BATS Global Markets, Inc., dated January 29, 2013 (suggesting a tick size pilot could be used to determine the optimal tick size for enabling efficient price discovery, while maintaining low transaction costs for investors, and improving efficient access to capital for small and middle capitalization companies), David Weild, Senior Advisor, Grant Thornton LLP, dated January 29, 2013 (indicating the belief that the implementation of a tick size pilot could be a step in increasing the number of initial public offering), Paul Jiganti, Managing Director, Market Structure Client Advocacy, TD Ameritrade, Inc., dated February 4, 2013 (indicating support for a tick size pilot and suggesting that such a pilot should focus on trading volume, price, volatility, and to a lesser extent, market capitalization), Patrick J. Healy, CEO, Issuer Advisory Group, dated February 4, 2013 (indicating the belief that while decimalization has been beneficial to the market, they would support a tick size pilot that would focus on less liquid companies), Colin Clark, Senior Vice President, NYSE Euronext, dated February 5, 2013 (suggesting that less liquid companies could benefit from increased tick sizes and that a pilot program could provide the Commission with data that can be utilized in a cost-benefit analysis to determine whether or not to make the pilot permanent), and Jeffrey M. Solomon, Chief Executive Officer, Cowen and Company, dated February 5, 2013 (suggesting that a pilot program could provide economically feasible means for investment banks to provide research on small capitalization stocks).

²⁵ A transcript of the Decimalization Roundtable is available at <http://www.sec.gov/news/otherwebcasts/2013/decimalization-transcript-020513.txt>. In addition, comments received by the Commission are available at <http://www.sec.gov/comments/4-657/4-657.shtml>. Since the roundtable, the Commission has received eleven additional comment letters. Generally, these later commenters expressed support for a pilot program to test wider tick size for smaller capitalization companies. See, e.g., letters from David Weisberger, Executive Principal, Two Sigma Securities, dated April 23, 2013; Stuart J. Kaswell, Executive Vice President and Managing Director, General Counsel, Managed Funds Association, dated May 1, 2013; Ernest F. Callipari, Equity Trader, dated May 29, 2013; Daniel Keegan, Managing Director, Head of Equities for the Americas, Citigroup Global Markets Inc., dated October 22, 2013 (commenting that pilot program should apply to illiquid stocks of all sizes); and Joseph Saluzzi, Partner, Themis Trading LLC, dated November 20, 2013. One commenter suggested that the Commission set the MPV at five cents. See letter from James J. Maguire, Sr., to Chair White, dated January 21, 2014.

Since the Decimalization Roundtable, discussions have continued with respect to the possibility of raising the minimum tick sizes for small capitalization stocks, and the prospect of a pilot program to test the impact thereof. The Small Company Advisory Committee, in March 2013, recommended that the Commission adopt rules that would allow small exchange-listed companies to choose their own minimum tick size from a limited range designated by the Commission.²⁶ In the view of the Small Company Advisory Committee, the economic incentives provided by wider minimum tick sizes would encourage market making and research analyst coverage, and thereby enhance the attractiveness of the IPO market for small companies and their ability to raise capital.

In November 2013, the Equity Capital Formation Task Force (“ECFTF”)²⁷ issued to the U.S. Department of the Treasury its report: *From the On-Ramp to the Freeway: Refueling Job Creation and Growth by Reconnecting Investors with Small-Cap Companies* (“ECFTF Report”).²⁸ The ECFTF recommended, among other things, that the exchanges conduct a pilot program, overseen by the Commission, that would establish the Small-cap Trading Rules (“STaR”) where, companies with a market capitalization below \$750 million would be quoted in

²⁶ See Advisory Committee on Small and Emerging Companies, *Recommendations Regarding Trading Spreads for Smaller Exchange-Listed Companies* (February 1, 2013) available at <http://www.sec.gov/info/smallbus/acsec/acsec-recommendation-032113-spread-tick-size.pdf>

²⁷ The Equity Capital Formation Task Force is comprised of representatives from mutual funds, venture capital firms, exchanges, broker-dealers, academics, investor relations advisors and securities industry trade groups. The task force was formed in June 2013 to: (1) examine the challenges that startups and small-cap companies face in raising equity capital in the public market environment, and (2) develop recommendations for policy-makers that will help such companies gain greater access to the capital they need to grow their businesses and generate private sector job growth.

²⁸ This report is available at <http://www.equitycapitalformationtaskforce.com/files/ECF%20From%20the%20On-Ramp%20to%20the%20Freeway%20vF.pdf>.

\$0.05 increments and would trade only at the bid, the offer, or the mid-point between the bid and the offer.

More recently, on January 31, 2014, the Commission's Investor Advisory Committee ("Investor Advisory Committee"),²⁹ recommended that the Commission not conduct a pilot program to study increased minimum tick sizes for small-capitalization companies.³⁰ In general, the Investor Advisory Committee expressed concern that a pilot that widens the minimum quoting increment would disproportionately harm retail investors because their trading costs would rise.³¹ If the Commission determines to conduct a tick size pilot,³² however, the Investor Advisory Committee recommended that any such pilot: (a) should be short-term, with a guaranteed sunset unless benefits are proven to outweigh the costs; (b) should be designed to

²⁹ The Investor Advisory Committee was established by Section 911 of the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank Act"), to advise the Commission on regulatory priorities, the regulation of securities products, trading strategies, fee structures, the effectiveness of disclosure, and on initiatives to protect investor interests and to promote investor confidence and the integrity of the securities marketplace. The Dodd-Frank Act authorizes the Investor Advisory Committee to submit findings and recommendations for review and consideration by the Commission. See Section 911 of the Dodd-Frank Act, Pub. L. 111-203, 124 Stat. 1376 (2010).

³⁰ The Investor Advisory Committee recommendations are available at <http://www.sec.gov/spotlight/investor-advisory-committee-2012/decimal-pricing-draft-recommendation-iac.pdf>. A member of the IAC dissented from this recommendation and recommended that the Commission conduct a pilot program with respect to modified decimal pricing. The dissenting opinion is available at <http://www.sec.gov/spotlight/investor-advisory-committee-2012/dissenting-opinion-decimalization-iac.pdf>.

³¹ The Investor Advisory Committee suggested that, if the Commission believes additional steps are needed to promote capital formation or enhance liquidity for smaller capitalization securities, the Commission should consider all approaches, such as, requiring the display of depth-of-book of orders, restricting certain jumping ahead strategies, and rules that better assure the validity of displayed quotes. See Investor Advisory Committee recommendations, *supra* note 30.

³² The Investor Advisory Committee noted that if the Commission nevertheless were to propose a pilot, it would review the details of the proposal and potentially reconsider its recommendation. See Investor Advisory Committee recommendations, *supra* note 30.

measure the costs and benefits to investors, with a particular focus on retail investors; and (c) should not focus exclusively on increasing tick size, but also on other changes that could encourage appropriate trading, enhance liquidity, or facilitate capital formation.³³

II. Discussion

Section 11A(a)(2) of the Act³⁴ directs the Commission, having due regard for the public interest, the protection of investors, and the maintenance of fair and orderly markets, to facilitate the establishment of a national market system for securities. Section 11A(a)(3)(B) provides the Commission the authority to require the SROs, by order, “to act jointly ...in planning, developing, operating, or regulating a national market system (or a subsystem thereof).”³⁵

The Commission believes that it is in the public interest for the Participants to develop and file with the Commission a Tick Size Pilot Plan, with the terms and conditions set forth in Section III below, as a national market system (“NMS”) plan pursuant to Rule 608(a) of Regulation NMS.³⁶ Once filed, the Commission would publish the Tick Size Pilot Plan for public comment, and thereafter consider whether to approve it, in accordance with Rule 608(b) of Regulation NMS.³⁷

Decimalization of the U.S. equity markets occurred over a decade ago. Since that time, the nature of trading, the structure of the markets, and the roles of market participants have

³³ The Commission continues to review the findings and recommendations of the Investor Advisory Committee. See Section 911(g) of the Dodd-Frank Act.

³⁴ 15 U.S.C. 78k-1(a)(2).

³⁵ 15 U.S.C. 78k-1(a)(3)(B).

³⁶ 17 CFR 242.608(a).

³⁷ 17 CFR 242.608(b).

changed significantly.³⁸ As discussed above, concerns have been expressed from a variety of sources that decimalization, and the associated one penny MPV, may have had a detrimental impact on the trading and liquidity of small capitalization stocks.³⁹ Therefore, the Commission believes that it is in the public interest for the Commission to further study and assess decimalization's impact on the liquidity and trading of the securities of small capitalization companies.⁴⁰ The submission of proposed NMS plan for a Tick Size Pilot Plan will provide the Commission with the means to continue to gather further information and views on the impact of decimalization on the liquidity and trading of the securities of small capitalization companies. In addition, a proposed NMS plan for a Tick Size Pilot Plan would allow the Commission to gather further comments on whether a Tick Size Pilot Plan is a viable vehicle by which the Commission could gather data to test whether a wider tick benefits small capitalization companies and their investors.

In the Decimalization Report, the Commission staff reviewed academic literature related to the impact of decimalization on the U.S. equity markets. While the academic literature indicated a number of potential benefits from decimalization, such as an overall reduction in effective and quoted spreads, there was some evidence that, at least for NASDAQ small

³⁸ See e.g., Concept Release, supra note 14.

³⁹ See e.g., *Rebuilding the IPO On-Ramp*, presented to the U.S. Department of Treasury (2011) ("IPO Task Force Report"); David Weild and Edward Kim, *Market Structure is Causing the IPO Crisis – and More*, Grant Thornton Capital Markets Series (June 2010).

⁴⁰ The Commission notes that some market participants have recommended that the Commission implement a pilot program that would permit tick increments smaller than \$0.01. See BATS/NASDAQ/NYSE Letter, supra note 17. The Commission continues to evaluate this petition. At this time, however, the Commission preliminarily believes that the Tick Size Pilot Plan should focus on the impact of wider ticks on the trading and liquidity of smaller companies for the reasons discussed herein.

capitalization stocks, the decline was not statistically significant.⁴¹ The academic literature also found, post-decimalization, evidence of a decline in quoted depth on average (although cumulative depth at competitive prices did not appear to change), smaller trade sizes, and an increase in the total time to work institutional orders.⁴² In addition, the Decimalization Report noted that the U.S. has an essentially flat, “one size fits all” tick size regime, as compared with many foreign jurisdictions that have adopted tiered regimes where the tick size varies depending on the price level of a stock.⁴³ Finally, at the Decimalization Roundtable, there was broad support among the panelists for the Commission to conduct a pilot program with respect to the impact of wider tick sizes on liquidity in small capitalization companies, even though views differed on the likely outcome of the pilot.⁴⁴

Support for a pilot program is not universal, however, particularly given that an increase in minimum tick sizes may raise costs for investors. This view was reflected, for example, at the Roundtable and in the recommendations of the Investor Advisory Committee.⁴⁵

Nevertheless, the Commission believes that legitimate questions have been raised as to whether the minimum tick size regime for the U.S. equity markets should be refined and enhanced. Specifically, the Commission preliminarily believes that it should assess, through a targeted short-term pilot program, whether wider minimum tick sizes for small capitalization stocks would enhance market quality to the benefit of market participants, issuers and U.S. investors. The Commission preliminarily believes that such a pilot should facilitate studies of

⁴¹ See Decimalization Report.

⁴² See *id.*

⁴³ See *id.*

⁴⁴ See *supra* note 25 and accompanying text.

⁴⁵ See *supra* notes 29 to 33 and accompanying text.

the effect of tick size on liquidity, execution quality for investors, volatility, market maker profitability, competition, transparency and institutional ownership. The Commission has set forth the details of a pilot program that the Commission preliminarily believes would produce measurable data that would allow the Commission and others to conduct such studies.

Further, the Commission preliminarily believes that the pilot described below is sufficiently limited so as to not cause excessive disruption to the market. The Commission preliminarily believes that the terms of the Tick Size Pilot Plan and the securities to be included should mitigate potential harm to investors in the form of increasing transaction costs, as expressed by the Investor Advisory Committee. The Commission would examine the data generated to measure, among other things, any change in transaction costs.

The Commission is ordering the Participants to jointly file the Tick Size Pilot Plan to assure that the pilot program, if ultimately approved by the Commission, applies uniformly across the U.S. markets. Once the Participants file the Tick Size Pilot Plan with the Commission, it will be published for public comment, and the Commission will carefully evaluate the comments received as the Commission considers whether to approve the Tick Size Pilot Plan.⁴⁶

III. Tick Size Pilot Plan

The Commission hereby orders the Participants to develop and jointly file with the Commission, as an NMS plan pursuant to Rule 608(a) of Regulation NMS,⁴⁷ a Tick Size Pilot Plan with the following terms and conditions:

⁴⁶ 17 CFR 242.608(b).

⁴⁷ 17 CFR 242.608(a).

• **Duration.** The length of the pilot program (“Pilot”) contemplated by the Tick Size Pilot Plan shall be one year. The Commission notes that there has been broad discussion about how long a pilot should run.⁴⁸ The Commission preliminarily believes that a one-year time period would generate sufficient data to reliably analyze the effects and impact of wider tick size.⁴⁹ The Commission preliminarily believes that the Participants should monitor the data generated during the Pilot Period.⁵⁰ The Commission expects that the data produced during the Pilot Period should allow the Commission and Participants to monitor the impact of the Pilot on the market and investors. Further, the Commission would engage in a proactive, ongoing review of the data that could inform whether any modifications of the Pilot are necessary.

• **Securities.** The securities to be included in the Pilot shall be securities that are NMS common stocks with: (1) a market capitalization of \$5 billion or less; (2) an average daily trading volume of one million shares or less; and (3) a share price of \$2 per share or more (“Pilot Securities”). The Commission preliminarily believes that these criteria will capture the securities of smaller and middle capitalization companies with low liquidity and trading activity and should

⁴⁸ See e.g., Letters from Jeffrey M. Solomon, Chief Executive Officer, Cowen and Company, dated February 5, 2013 (suggesting a pilot term of 7 years); David Weild, Senior Advisor, Grant Thornton LLP, dated January 29, 2013 (suggesting a pilot term of 5 years); Colin Clark, Senior Vice President, NYSE Euronext, dated February 5, 2013 (suggesting a pilot term of no longer than one year); David Weisberger, Executive Principal, Two Sigma Securities, dated April 23, 2013 (suggesting a pilot term of at least one year); and Daniel Keegan, Managing Director, Head of Equities for the Americas, Citigroup Global Markets, Inc., dated October 22, 2013 (suggesting a pilot term of one year). See also, the Investor Advisory Committee recommendations, supra note 30, which recommended that any pilot be short-term, with a guaranteed sunset.

⁴⁹ These preliminary beliefs are based on analysis of power statistics for relevant liquidity measure, e.g., trading volume. Being able to examine a subset of stocks facilitates the examination of potential threshold levels.

⁵⁰ During the Pilot Period, the Commission preliminarily believes that Participants should notify the Commission if they detect any broadly negative impact of the Pilot on market quality.

provide the Pilot with a broad sample on which to test the impact of wider tick sizes.⁵¹

Requiring stock prices to be \$2 or more per share assures that “sub-penny stocks”⁵² are not included in the Pilot.

In addition, these thresholds are not set directly by the tick size so they are relatively exogenous, which could help to inform the Commission about any potential rulemaking based on the results of the Pilot. Overall, because the stocks below these thresholds have higher average effective spreads, the thresholds, though exogenous help to target the pilot towards those stocks most likely to benefit from a larger tick size. Finally, this group is broad enough to allow researchers to examine various threshold levels for potential rulemaking.

- **Pilot Design.** The Pilot should consist of one control group and three test groups with 300 Pilot Securities in each test group. The selection of Pilot Securities to be included in each test group should involve stratified sampling by market capitalization and price. The Commission preliminarily believes that choosing three relatively small test groups would minimize any potential disruption to the current market.⁵³ The Commission also preliminarily

⁵¹ The market capitalization and average daily trading volume thresholds are based on a staff examination of effective spreads. Stocks above these thresholds typically have effective spreads below \$0.02. Stocks below these thresholds vary with some in the \$0.01 range but most above \$0.02 and a substantial percentage above \$0.05. These thresholds should capture the stocks that would benefit most from an increased tick size while still allowing researchers to assess which stock characteristics might be correlated with positive results from larger tick sizes and which would be correlated with negative results from larger tick sizes.

⁵² “Sub-penny stocks” are NMS stocks with a stock price below \$1 that have a minimum quote increment of \$0.0001 under current rules. The threshold of \$2 was chosen to mitigate the effect of NMS stocks for which stock prices may decline to below \$1 during the pilot period.

⁵³ Some commenters suggested that a pilot test several tick sizes. See e.g., Letter from David Weild, Senior Advisor, Grant Thornton LLP, dated January 29, 2013 (suggesting five tick increments of \$0.25, \$0.10, \$0.05, \$0.02, and \$0.01); and Jeffrey M. Solomon,

believes that having a control group is vital to test the effects of larger tick size, and that a control group with the current quoting and trading increments would best represent a baseline for the analysis of the effect of the pilot. Further, the Commission preliminarily believes that three test groups should generate sufficient data to test a variety of potential changes, described below. Finally, the Commission preliminarily believes that the inclusion of 300 Pilot Securities per test group should allow each test group to be statistically large enough to generate data to reliably test for the effects of larger tick size and to examine thresholds for any potential rulemaking in the future.⁵⁴

- **Control Group.** Pilot Securities in the Control Group shall be quoted at the current tick size increment, \$0.01 per share, and trade at the increments currently permitted.
- **Test Group One.** Pilot Securities in Test Group One would be quoted in \$0.05 minimum increments. Trading could continue to occur at any price increment that is permitted today. The Commission preliminarily believes that the \$0.05 minimum quoting increment is appropriate. Commission staff's preliminarily analysis of the Pilot Securities⁵⁵ indicates that a significant percentage of Pilot Securities have bid-ask spreads greater than \$0.05. Therefore, the

Chief Executive Officer, Cowen and Company, dated February 5, 2013 (suggesting four tick increments of \$0.20, \$0.10, \$0.05 and \$0.01). At this time, the Commission is concerned about the cost and complexity of a pilot that contains more test groups. See e.g., Letter from David Weisberger, Executive Vice President, Two Sigma Securities, dated April 23, 2013 to Elizabeth M. Murphy, Secretary, Commission ("We urge the Commission to keep the design of the pilot simple. Simplicity will ensure timely implementation and reduce operational risks as most firms will have to conduct an extensive review of their trading software to comply with the pilot.").

⁵⁴ These preliminary beliefs are based on staff analysis of power statistics for relevant liquidity measures, e.g., trading volume. In particular, the staff focused on the least active stocks and assessed how many stocks would be needed to detect changes in daily liquidity measures. The staff selected 300 as a sample size to provide sufficient power to detect changes in liquidity measures for a subset of pilot stocks.

⁵⁵ See supra note 51.

Commission believes that the five cent increment should be relatively conservative so as to limit increases in transaction costs for investors.⁵⁶ In addition, for those securities that currently have spreads greater than \$0.05, the introduction of a minimum quoting increment would prevent market participants from “pennying” quotes, (i.e., improving the displayed quote by only one penny to gain execution priority) as quotes will be made in 5 cent increments. Finally, the 5 cent minimum quoting increment will allow data to be developed to test whether liquidity increases due to the aggregation of liquidity at the 5 cent increments for these securities.

There are other Pilot Securities that currently have spreads that are less than \$0.05. The spreads in these Pilot Securities would be directly impacted. However, their inclusion in the Pilot would allow data to be developed to study the impact on liquidity for these stocks as well. Moreover, trading in this group can occur at any price increment allowable today, so the data generated from this group should isolate the effects of an increased quoting increment.

The \$0.05 minimum quoting increment is significantly larger than the current \$0.01 but smaller than the 1/16th of \$1.00 increment used immediately prior to decimalization. Relative to the alternative minimum quoting increments that could be considered, the Commission preliminarily believes \$0.05 provides a good balance between assuring the ability to measure the hypothesized effect, if it exists, and mitigating any potential harm to liquidity as a result of a tick size that is too large. Therefore, the Commission preliminarily believes that a \$0.05 minimum quoting increment should be sufficient to test the effects of a larger minimum quoting increment for the Pilot Securities. The Commission preliminarily believes that changing the minimum

⁵⁶ The transaction cost is measured by the difference of an investor buying a security at the offer and then immediately selling the same security at the bid. Thus, the wider the minimum quoting increment, the greater the transaction cost would be for such round trip trade.

quoting increment for Test Group One would generate data about the impact of changing the minimum quoting increment, and only the minimum quoting increment, for the Pilot Securities overall.

- **Test Group Two.** Pilot Securities in Test Group Two would be quoted in \$0.05 minimum increments, and traded in \$0.05 minimum increments subject to certain exceptions. The following exceptions from the \$0.05 minimum trading increment would be permitted: (1) trading could occur at the mid-point between the national best bid or offer (“NBBO”); (2) retail investor orders could be provided with price improvement that is at least \$0.005 better than the NBBO (i.e., 10% of the \$0.05 tick size); and (3) certain negotiated trades (i.e., trades with a performance target such as volume-weighted average price trades and time-weighted average price trades;⁵⁷ and qualified contingent trades;⁵⁸) could continue to occur at any price increment that is permitted today.

⁵⁷ A volume-weighted average price trade is calculated by summing up the products of the number of shares traded and the respective share price, and dividing by the total number of shares bought. A time-weighted average price trade is calculated as the average price of a security over a specified period of time.

⁵⁸ A qualified contingent trade is 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 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 cancelled; (6) the transaction is fully hedged (without regard to any prior existing position) as a result of the other components of the contingent trade; and (7) the transaction that is part of a contingent trade involves at least 10,000 shares or has a market value of at least \$200,000.

The Commission preliminarily believes that changing the quoting increment alone may not be adequate to test the effects of larger tick size. The Commission preliminarily believes that if the minimum quoting increment is changed without corresponding changes to the minimum trading increment, market participants may be hesitant to display liquidity because of the ability to step ahead of wider quotes. Therefore, the Commission preliminarily believes that a test group should be established to examine this potential impact on displayed liquidity in conjunction with Test Group One.⁵⁹ The Commission also preliminarily believes that limited exceptions to the trading increment should be allowed so as not to prohibit certain categories of trades that are broadly beneficial to market participants today. First, negotiated trades such as volume-weighted average price trades or time-weighted average price trades are used to execute a trading strategy over volume or time. By their definition, the price to be executed with these negotiated trades would not be at the NBBO or a \$0.05 increment.⁶⁰ In addition, retail orders often receive price improvement to the benefit of retail investors.⁶¹ The Commission preliminarily believes that preserving retail investors' ability to receive price improvement on

⁵⁹ A pilot with Test Group Two alone cannot examine the issue. A comparison of Test Group Two to Test Group One can test the incremental effect of adding trading increments to wider quoting increments.

⁶⁰ The Commission staff has previously stated that, with respect to Rule 612 of Regulation NMS a performance target is not generally a price subject to Rule 612 as long as it is not used analogously to a limit price for ranking or displaying an order. However, if the performance target were an explicit impermissible sub-penny price and also served as a limit price, then accepting the order would be a violation. Similarly, if the customer specifies a limit price in addition to the performance target, the limit price must meet the requirements of the Rule. Available at <http://www.sec.gov/divisions/marketreg/subpenny612faq.htm>). The negotiated trade exception contained herein would be subject to the same general principle, *i.e.*, the trades must not be designed to explicitly circumvent the trading increment.

⁶¹ See *e.g.*, BATS BYX Rule 11.24; Nasdaq Rule 4780; NYSE Rule 107C; NYSE Arca Equities Rule 7.44; and NYSE MKT Rule 107C.

their orders would limit a potential negative impact of the Pilot on costs for retail investors.⁶²

The Commission preliminarily believes that changing the quoting increment and trading increment for Test Group Two could generate useful data on the effects of quoting and trading increments on the Pilot Securities.

- **Test Group Three.** Pilot Securities in Test Group Three would be subject to the same minimum quoting and trading increments (and exceptions thereto) as Test Group Two, but in addition would be subject to a “trade-at” requirement. Generally, a trade-at requirement is intended to prevent price matching by a trading center not displaying the NBBO. Under a trade-at requirement, a trading center that was not displaying the NBBO at the time it received an incoming marketable order could: (1) execute the order with significant price improvement (such as the minimum allowable \$0.05 increment or the mid-point between the NBBO),⁶³ (2) execute

⁶² Today, retail investors typically receive price improvement on their orders over the NBBO. The Concept Release noted that in 2009, the eight broker-dealers with significant retail customer accounts route nearly 100% of their customer market orders to over-the-counter market makers for execution. See Concept Release, supra note 14. See also Letters from David Weisberger, Executive Principal, Two Sigma Securities, dated April 23, 2013 (“As a further protection against increased costs, the Commission should continue to permit executions at prices between the minimum quoting increments. Banning such executions would not only add to the complexity of evaluating the pilot’s results, but would effectively deprive retail and institutional investors of an opportunity to receive price improvement.”) to Elizabeth Murphy, Secretary, Commission; and Paul Jiganti, Managing Director, Market Structure and Client Advocacy, TD Ameritrade dated October 31, 2013 (“If there is going to be a tick size pilot program, we recommend that it is controlled, limited in scope and time, and one that does not compromise the benefits retail customers receive from Regulation NMS.”) to the Honorable Mary Jo White, Chair, Commission. But see letter from Joseph Saluzzi, Partner, Themis Trading LLC, dated November 20, 2013 (recommending that the trading increments under a pilot be limited to the bid, the offer or the mid-point between the two. “Allowing internalizers to jump ahead of displayed liquidity for de minimis price improvement would continue to discourage displayed liquidity and harm the price discovery process.”).

⁶³ For retail investor orders, trading centers would be required to provide the minimum price improvement of 10% of the \$0.05 tick size as described under Test Group 2.

the order at the NBBO with significant size improvement if the size of the order was of block size⁶⁴, or (3) route intermarket sweep orders⁶⁵ to execute against the full displayed size of protected quotations at the NBBO and then execute the balance of the order at the NBBO price. The Commission preliminarily believes that a trade-at requirement should be included in the Pilot.⁶⁶ When quoting and trading increments are widened in the absence of a trade-at requirement, the Commission preliminarily believes there is a possibility trading volume could migrate away from “lit venues” -- trading venues that provide public pre-trade transparency by displaying the best-priced quotations – to “dark venues” that do not provide such public pre-trade price transparency. The percentage of trading volume executed in dark venues has increased in recent years. In 2009, trading volume executed in dark venues was approximately 25 percent. Today, it is approximately 35 percent.⁶⁷ The Commission believes that if trading

⁶⁴ Block size refers to an order that is (1) at least 10,000 shares or (2) for a quantity of stock having a market value of at least \$200,000. See Rule 600(b)(9) of Regulation NMS, 17 CFR 242.600(b)(9).

⁶⁵ Intermarket sweep orders are exceptions provided in Rule 611(b)(5) and (6) of Regulation NMS that enable an order router to sweep one or more price levels simultaneously at multiple trading centers without violating trade-through restrictions. As defined in Rule 600(b)(30) of Regulation NMS, intermarket sweep orders must be routed to execute against the full displayed size of any protected quotation that otherwise would be traded through by the orders. See also Responses to Frequently Asked Questions Concerning Rule 611 and Rule 610 of Regulation NMS, Question 4.04 (April 4, 2008 Update) (available at <http://www.sec.gov/divisions/marketreg/nmsfaq610-11.htm>).

⁶⁶ One commenter supports the inclusion of a trade-at requirement in a tick pilot. See letter from Christopher Nagy, CEO, and David Lauer, President, KOR Group LLC, to Ms. Murphy, Commission, dated April 4, 2014.

⁶⁷ See OTC Trading: Description of Non-ATS OTC Trading in National Market System Stocks by Laura Tuttle, March 2014 (available at http://www.sec.gov/marketstructure/research/otc_trading_march_2014.pdf); Equity Market Structure Literature Review Part I: Market Fragmentation by Staff of the Division of Trading and Markets, October 7, 2013 (available at <http://www.sec.gov/marketstructure/research/fragmentation-lit-review-100713.pdf>); and

volume in Test Group Two Pilot Securities moves to undisplayed trading centers, then including the trade-at requirement in Test Group Three could test whether trading remains on lit venues and what impact, if any, the migration of trading from lit venues to dark venues would have on liquidity and market quality for the Pilot Securities.

Therefore, the Commission preliminarily believes that the Pilot should test whether a trade-at requirement would stem the potential migration of trading volume away from these lit venues. The inclusion of a trade-at requirement would allow the Commission generate and analyze data on the impact of a trade-at requirement in conjunction with wider tick sizes. In particular, a comparison of Test Group Three to Test Group Two would provide insight into the incremental effects of a trade-at requirement.

- **SRO Data for the Tick Size Pilot.** The Commission preliminarily believes that the following data should be collected and transmitted to the Commission and made available to the public in an agreed-upon format on the frequency noted below. The Commission intends to study such data to assess the impact of the changes made under the Pilot. The Commission believes that making the data available to the public, in an agreed-upon format would facilitate the public's ability to assess the impact of the pilot.

- **Identification of Pilot Securities.** On each day during the Pilot, the primary listing exchanges should make publicly available the list of stocks included in each Test Group, adjusting for ticker symbol changes and relevant corporate actions, as set forth in Annex A.

Alternative Trading Systems: Description of ATS Trading in National Market System Stocks by Laura Tuttle, October 2013 (available at <http://www.sec.gov/marketstructure/research/alternative-trading-systems-march-2014.pdf>).

- **Pilot Data.** The Commission preliminarily believes that the Participants should provide to the Commission the data set forth in Annex B or explain in the NMS Plan any data alternatives that would to the same extent facilitate the studies of the effect of tick size mentioned in this order. All data must be provided in an agreed-upon format, on a monthly basis and made publicly available. The data should be provided for dates starting six months prior to the Pilot period through six months after the end of the Pilot period. The Commission intends to study such data to assess the impact of the changes made under the Pilot.
- **Assessments.** The Commission preliminarily believes that the Participants, either individually or jointly, should provide to the Commission and make publicly available their assessment of the impact of the Pilot no later than six months after the end of the Pilot Period, as follows:
 - A. Assess the statistical and economic impact of an increase in the quoting increment on market quality.
 - B. Assess the statistical and economic impact of an increase in the quoting increment on the number of market makers⁶⁸
 - C. Assess the statistical and economic impact of an increase in the quoting increment on market maker participation.
 - D. Assess the statistical and economic impact of an increase in the quoting increment on market maker profits.

⁶⁸ The term “market makers” includes all registered market makers and other registered liquidity providers.

- E. Assess the statistical and economic impact of an increase in the quoting increment on market transparency.
- F. Evaluate whether any thresholds can differentiate the results of the above assessments across stocks. (e.g., whether stocks above the threshold have negative effects while stocks below the threshold have positive effects)
- G. Assess 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.
- H. Assess the statistical and economic impact of the above assessments for the incremental impact of a trade-at rule and for the joint effect of an increase in a quoting increment with the addition of a trading increment and a trade-at rule.
- I. Assess any other economic issues that the Participants believe the Commission should consider in any rulemaking that may follow the Pilot.

IT IS HEREBY ORDERED, pursuant to Section 11A(a)(3)(B) of the Act,⁶⁹ that the Participants act jointly in developing and filing with the Commission, as an NMS plan pursuant to Rule 608(a) of Regulation NMS,⁷⁰ a Tick Size Pilot Plan, as described above. The Participants are ordered to file with the Commission such Tick Size Pilot Plan no later than August 25, 2014.

By the Commission.

Kevin M. O'Neill
Deputy Secretary

⁶⁹ 15 U.S.C. 78k-1(a)(3)(B).

⁷⁰ 17 CFR 242.608(a).

Annex A

These datasets can include additional fields as agreed upon by the Participants.

1. A dataset identifying pilot stocks containing the following fields in a pipe delimited format with the field names as the first record. The SROs should use consistent file name formats.
 - a) Ticker Symbol
 - b) Security Name
 - c) Listing Exchange
 - d) Date
 - e) Tick Size Pilot Group – character value of
 - 1) “C” for stocks in the Control Group
 - 2) “G1” for stocks in Test Group One
 - 3) “G2” for stocks in Test Group Two
 - 4) “G3” for stocks in Test Group Three
2. A dataset that identifies changes in the pilot ticker symbols on that day containing the following fields and in a pipe delimited format with field names as the first record.

The SROs should use consistent file name formats.

 - a) Ticker Symbol
 - b) Security Name
 - c) Listing Exchange
 - d) Effective Date
 - e) Deleted Date
 - f) Tick Size Pilot Group – character value of
 - 1) “C” for stocks in the Control Group

- 2) “G1” for stocks in Test Group One
- 3) “G2” for stocks in Test Group Two
- 4) “G3” for stocks in Test Group Three
- g) Old Ticker Symbol(s)
- f) Reason for the change – character value agreed upon by SROs

Annex B

These datasets can include additional fields as agreed upon by the SROs. The data need only include stocks meeting the thresholds for inclusion in one of the three Test Groups and the Control Group as of the date of selection.

A dataset of daily market quality statistics of orders by security, order type, original order size (as observed by SRO), hidden status, and coverage under Rule 605 in a pipe delimited format with field names as the first record:

1. Minimum Fields: same as Rule 605 fields, except as modified below, and, as defined below, Rule 605 Coverage, Hidden Status, Original Percentage Hidden, and Final Percentage Hidden.
2. The SRO should include only orders executed on their exchanges (or OTC in the case of FINRA).
3. The order size should be the original order size as observed by the SRO.
4. Modified order size categories (slightly different than Rule 605): less than 100, 100 to 499 shares, 500 to 1999 shares, 2000 to 4999 shares, 5000 to 9999 shares, and 10000 or greater shares.
5. Modified execution speed categories include: orders executed from 0 to <100 microseconds, 100 microseconds to <100 milliseconds, 100 milliseconds to < 1 second, 1 second to <30 seconds, 30 seconds to <60 seconds, 60 seconds to < 5 minutes, 5 minutes to 30 minutes.
6. Hidden status should include orders for which the instructions indicate that the order is not displayable in part or full.

- a) Hidden status is a character variable with the values “entirely displayable,” “partially displayable,” and “not displayable” or other values as agreed upon by the SROs.
 - b) Original Percentage Hidden is the percentage of shares not displayable as of order receipt, regardless of its placement relative to the quotes. For example, a buy order for 5000 shares with an instruction to not display 4000 shares would be 80% hidden regardless of whether it is greater than or less than the bid price.
 - c) Final Percentage Hidden is the percentage of shares not displayed prior to final order execution or cancellations. For example, suppose a buy order for 5000 shares with an instruction to display not more than 1000 shares at a time. After the first 1000 shares execute a second 1000 is displayed. If the order is cancelled before any more executions, the final percentage hidden is 60%.
7. Orders to include: Market orders, marketable limit orders, inside-the-quote limit orders, at-the-quote limit orders, near-the-quote limit orders, and intermarket sweep orders (ISOs), including those not covered by Rule 605.
 8. Rule 605 coverage: indicate whether the order is covered in Rule 605 (“Yes”) or reason for not covered (character variable with the consistent values across SROs such as “opening”, “closing”, “stop price”, “full size”, “short sale”, “other tick/bid sensitive”, “not held”, “special settlement”, “non-market,” “order size > 10,000”, or other values as agreed upon by SROs)

A dataset of daily number of registered market makers⁷¹ by security in a pipe delimited format with field names as the first record:

1. Minimum fields: SRO, number of registered market makers, number of other registered liquidity suppliers.

A dataset of daily market maker participation and trading profits of orders by security in a pipe delimited format with field names as the first record:

1. Minimum fields: SRO, total market maker share participation, total market maker trade participation, cross-quote market maker share participation, cross-quote market maker trade participation, inside-the-quote market maker share participation, inside-the-quote market maker trade participation, at-the-quote market maker share participation, at-the-quote market maker trade participation, outside-the-quote market maker share participation, outside-the-quote market maker trade participation, raw market maker realized trading profits, market maker realized trading profits net of fees and rebates, raw market maker unrealized trading profits.
2. Participation fields:
 - a) 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, this should be a share-weighted average per market maker.
 - b) Trade participation: the number of purchases and sales by market makers in a principal trade, not including riskless principal. When aggregating across market makers, this should be a trade-weighted average per market maker.

⁷¹ The term “market makers” includes all registered market makers and other registered liquidity providers.

- c) Cross-quote participation refers to the market maker buying at or above the national best offer or selling at or below the national best bid at the time of the trade.
 - d) Inside-the-quote participation refers to a trade price that is between the national best bid and offer prices at the time of the trade.
 - e) At-the-quote (outside-the-quote) participation refers to a buy price that is equal to (less than) the national best bid price at the time of or immediately before the trade. In the case of downward moving national best bid, use the national best bid price immediately before the trade. Otherwise, use the national best bid price at the time of trade. For a sell price, use the same method with the national best offer price.
3. Trading profit fields:
- a) Realized trading profits are the difference between the market value of market maker sales (shares sold $\times$ price) and the market value of market maker purchases (shares purchased $\times$ price). Use a LIFO-like method for determining which share prices to use in the calculation. When aggregating across market makers, this should be a share-weighted average per market maker.
 - b) Realized trading profits net of fees and rebates are the 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 allocations of rebates and fees, use expected rebates and fees.
 - c) Unrealized trading profits are the difference between the purchase or sale price of the end-of-day inventory position of the market maker and the official closing

price. In the case of a short position, subtract the closing price from the sale price. In the case of a long position, subtract the purchase price from the closing price.

A dataset of market orders and marketable limit orders in a pipe delimited format with field names as the first record.

1. Minimum fields: ticker symbol, date, order receipt time, order type, order size in shares, order side (“B”, “S”, or “SS”), order price (if marketable limit), NB quoted price, NB quoted depth in lots, receiving market offer for buy or bid for sell, receiving market depth (offer for buy and bid for sell), indicator for quote leader, average execution price (share-weighted), executed shares, canceled shares, routed shares, routed average execution price (share-weighted), indicator for special handling instructions.
2. Quote variables:
 - a) NB quoted price is the national best offer for buys and the national best bid for sells.
 - b) NB quoted depth is the NBO depth for buys and NBB depth for sells.
 - c) The indicator for quote leader is 1 if the receiving market was the first market to post the NBB for a sell or NBO for a buy.
3. Average execution price is a share-weighted average that includes only executions on the receiving market. Routed average execution price is a share-weighted average that includes only shares routed away from the receiving market.
4. Routed shares refers to the number of shares in the order that were routed to another exchange or market.

5. The indicator for special handling instructions should identify orders that contain instructions that could result in delayed execution or an execution price other than the quote.

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