Testimony on Regulatory Reforms to Improve Equity Market Structure

by

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Subcommittee on Securities, Insurance, and Investment

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Chairman Crapo, Ranking Member Warner, and Members of the Subcommittee:

Thank you for inviting me to testify on behalf of the U.S. Securities and Exchange Commission (SEC or Commission) regarding equity market structure. I welcome this opportunity to discuss with you a topic of such importance to investors, public companies, our securities markets, and capital formation.

The securities markets are ever-evolving and technology has been the primary driver of the changes. The ongoing challenge for regulators is to ensure that regulatory regimes are appropriately updated to respond to evolving market mechanisms and trading practices.

Today, I will update you on the SEC's efforts for meeting this challenge with respect to the U.S. equity markets. Enhancing equity market structure continued to be a primary focus of SEC efforts in 2015, as it will be in 2016. Among other things, the SEC published a proposal to enhance the operational transparency of alternative trading systems (ATSs), proposed amendments to a rule that would require broker-dealers engaging in proprietary trading at off-exchange venues to become members of a national securities association, and approved a pilot program to assess the effect of tick sizes on market quality for smaller companies. We plan to continue to make important strides in 2016.

I. Overview of the SEC's Program for Equity Market Structure

Today's equity markets, as you know, are dominated by computer algorithms. These algorithms are capable of generating, routing, and executing orders with enormous sophistication, volume, and speed. They have introduced types of market mechanisms and trading practices that were not possible in the days of manual markets.

Our regulatory regime must keep pace with and adjust appropriately in response to these market changes. But doing so requires thorough study and an appreciation of the workings of the full market. Market structure issues typically are complex and highly interrelated. Even when a particular problem is identified, efforts to develop a response must reflect a full consideration of the risk of unintended consequences.

To meet this challenge, the SEC is engaging in an ongoing equity market review that is based on three key elements – it is data-driven, open to considering a wide range of views on all issues, and comprehensive in scope.

Data-Driven Analyses

A vital first step in dealing with market structure questions is to marshal relevant data. Although data analyses alone cannot dictate particular outcomes, they are extremely valuable in helping to narrow the range of differences in perspectives and of viable regulatory responses. Accordingly, the SEC has made concerted efforts in recent years to strengthen its capabilities for data collection and analysis. These efforts include capturing a wider range of data sources, deploying more sophisticated technology tools for analyzing data, and employing additional personnel with the necessary quantitative skill sets to use these tools.

The SEC is committed to bringing data analysis fully to bear on equity market structure issues. Many of the results of these efforts can be found on an SEC webpage that is devoted to helping inform the public debate on equity market structure.[1] The webpage includes a series of research papers, underlying data highlights, and literature reviews prepared by SEC staff that address issues such as the speed of trading, trading in off-exchange venues, high frequency trading, market fragmentation, and market quality for small capitalization companies. Most recently, staff-prepared papers were added that address two notable market events that occurred in 2015 – the New York Stock Exchange (NYSE) trading suspension on July 8th and the August 24th market volatility – both of which are discussed further below.

Open to Wide Range of Views

Many market structure issues arise in the context of proposed SEC rules, national market system (NMS) plans, and exchange rules. These procedural contexts provide an opportunity for public comment. Given the complexity of market structure issues, however, the SEC has taken the extra step of seeking out a wide range of views in contexts other than specific proposals and adoptions. These have included a concept release,[2] public roundtables,[3] and a request for comment on particular topics.[4] The SEC also has approved over forty exchange-level active pilots, as well as two market structure-related pilots initiated by the Commission and implemented in the form of NMS plans submitted by the exchanges and FINRA.

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[1] *See* http://www.sec.gov/marketstructure/.

[2] Concept Release on Equity Market Structure, Securities Exchange Act Release No. 61358, 75 FR 3594 (January 21, 2010) (File No. S7-02-10), *available at* http://www.sec.gov/rules/concept/2010/34-61358fr.pdf.

[3] A roundtable on decimalization was held at the SEC on February 5, 2013, and a roundtable on market structure was held at the SEC on June 2, 2010.

[4] Request for Comment on Exchange-Traded Products, Securities Exchange Act Release No. 75165, 80 FR 34729 (June 17, 2015), *available at* https://www.gpo.gov/fdsys/pkg/FR-2015-06-17/pdf/2015-14890.pdf.

To further provide an opportunity for a wide range of views and inputs, the SEC established the Equity Market Structure Advisory Committee (EMSAC), which held its first meetings in 2015. The 17 members of EMSAC bring an enormous range of expertise, experience, and perspectives to their deliberations on equity market structure. EMSAC brings in an even wider range of perspectives by inviting non-members to make presentations on key issues at each EMSAC meeting. EMSAC also has formed four subcommittees to affirmatively seek out additional viewpoints and conduct detailed evaluations of market structure issues for EMSAC's consideration. As discussed further below, EMSAC's public proceedings already have shed a great deal of light on key market structure issues,[5] and I anticipate this will continue in 2016. To date, the EMSAC has not provided the Commission with any recommendations.

Comprehensive in Scope

The U.S. equity market is a complex ecosystem in which different types of market participants employ a range of tools and strategies to trade on 12 registered exchanges, more than 40 ATSs, and more than 200 non-ATS broker-dealers. Properly assessing market structure issues requires a full appreciation of the extent to which these market participants, tools, and trading venues are interrelated. Rarely, if ever, does a material change in one aspect of market structure not have important effects in other aspects of market structure.

Accordingly, the SEC's equity market structure program does not attempt to address issues in isolation, but rather is comprehensive in scope. As laid out in Chair White's market structure remarks in June 2014,[6] the SEC has advanced initiatives that address five broad categories of issues: market stability, high frequency trading, fragmentation, broker conflicts, and quality of markets for smaller companies. Focus on these substantive issues is intended to help address particular areas of concern, while still providing an opportunity to assess the extent to which issues and initiatives across different categories are interconnected.

II. Equity Market Structure Developments and Initiatives

A. Market Events in 2015

There were two notable market structure events that occurred in 2015 – the NYSE's suspension of trading on that exchange for more than three hours on July 8, 2015, and the unusual level of price volatility on August 24, 2015. While the markets generally responded well, each event brought to light certain issues and provided a useful opportunity for focused empirical analysis by SEC staff.

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[5] *See* http://www.sec.gov/spotlight/equity-market-structure-advisory-committee.shtml.

[6] Chair White's June 5, 2014 speech entitled "Enhancing Our Equity Market Structure" is available at https://www.sec.gov/News/Speech/Detail/Speech/1370542004312.

NYSE Trading Suspension on July 8, 2015

On July 8, 2015, the NYSE, because of a systems issue, suspended trading in all symbols on the exchange at 11:32 a.m. and reopened at 3:10 p.m.[7] To help assess the effect of this suspension on trading, on February 3, 2016, SEC staff in the Office of Analytics and Research (OAR) within the Division of Trading and Markets published a Data Highlight on the SEC's equity market structure website. The Data Highlight examines trading volume, quoted spreads, and quoted depth before, during, and after the suspension.[8]

Total trading volume in NYSE-listed corporate stocks on July 8 was well within the range of observed trading volume in the first seven months of 2015. While the NYSE's share of trading volume declined, other market centers – especially other exchanges – experienced corresponding large increases in trading volume in NYSE-listed stocks on July 8. The Data Highlight observed, however, that NYSE-listed stocks experienced substantial increases in spreads and substantial decreases in depths. Not all NYSE-listed stocks were equally affected by the NYSE trading suspension. Large cap NYSE-listed stocks experienced the biggest declines in depth, while small cap NYSE-listed stocks experienced the biggest increases in spreads.

The observations in the Data Highlight reflect the resilience of the U.S. equity market structure to the sudden withdrawal of even a large exchange, but also suggest that such a withdrawal is not without effects on market quality. In this respect, the event demonstrates the need for continued emphasis on systems reliance and integrity that has been a focus of the SEC's efforts in recent years and is discussed below.

In addition, although the NYSE was able to resume trading on July 8 prior to its closing auction, the potential that it would not be able to do so highlighted the need to address a "single point of failure" in equity market structure at the close. This type of vulnerability has been targeted by the critical market infrastructure initiative of the SEC and self-regulatory organizations (SROs). The opening and closing auctions on primary listing exchanges are integral aspects of a normal trading day and continue to be dominated by the primary listing markets. As discussed below, NASDAQ and NYSE are working to achieve redundancy in these auctions.

Price Volatility on August 24, 2015

On Monday, August 24, 2015, the U.S. equity markets and equity-related futures markets experienced unusual price volatility, particularly during the period surrounding the 9:30 a.m. opening of regular trading hours at the start of a new trading week. To help assess the operation of the U.S. equity markets under stressed conditions, SEC staff in OAR published a Research Note on the August 24 event on the SEC's equity market structure website.[9] In recent years, the

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[7] *See* https://www.nyse.com/market-status/history for a description of the events leading up to the trading suspension at NYSE on July 8, 2015.

[8] The data highlight is available at http://www.sec.gov/marketstructure/research/highlight-2016-01.html

[9] The Research Note is available at https://www.sec.gov/marketstructure/research/equity_market_volatility.pdf.

SEC and SROs have implemented several regulatory initiatives to address severe short-term price volatility.[10] The events of August 24 provided a useful opportunity to evaluate the practical operation of these initiatives under stressed market conditions. The Research Note provides empirical data and other information to help assess trading on August 24, including several issues that have been debated among market participants and observers. These issues include the opening process at primary listing exchanges, the triggering of trading pauses under the National Market System Plan to Address Extraordinary Market Volatility (commonly known as the "Limit Up-Limit Down," or "LULD Plan"), and the effects of market volatility on trading in exchange-traded products (ETPs).

The empirical data in the Research Note suggests that, in contrast to the Flash Crash on May 6, 2010,[11] broad market prices did not "flash crash" – defined as a sudden and extreme price decline that is unexplained by the arrival of new information and is soon reversed. On August 24, broad market prices already had declined by 5% in pre-9:30 trading. At 9:30, the equity markets opened for regular trading hours at broad market price levels that were consistent with the pre-9:30 trading. The broad market then absorbed a surge in price-insensitive selling (with volume as much as 4 to 8 times higher than normal in many securities) with a relatively small price decline of 2% and soon recovered. Also, unlike the 2010 Flash Crash, equity market infrastructure and trading systems held up without serious incident to the high trading volume and message traffic of August 24.

However, the empirical data in the Research Note also suggests certain issues that arose on August 24 that generally fall within three broad categories and require attention.

First, in the opening minutes of trading on August 24, a significant minority of ETPs experienced what could be described as a breakdown in arbitrage – specifically, they traded at substantial discounts to the underlying indexes they were designed to track.

Second, many of these ETPs that experienced high volatility triggered trading pauses under the LULD Plan. These trading pauses helped prevent the irrational prices that occurred during the 2010 Flash Crash (such as one penny prices). The ETPs, however, did not resume trading in an orderly fashion, but traded erratically in ways that triggered additional LULD pauses. More than 80% of LULD pauses on August 24 occurred in ETPs, and most of these were repeat pauses in the same symbols and occurred when prices were recovering upward. Notably, although a significant minority of ETPs experienced severe volatility and multiple LULD pauses on August 24, a majority of ETPs experienced levels of volatility consistent with broad market prices, and 80% of ETPs did not experience a single LULD pause.

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[10] Such initiatives include the revision of market-wide circuit breakers that apply across the securities and futures markets and the National Market System Plan to Address Extraordinary Market Volatility (commonly known as the Limit Up-Limit Down, or LULD, Plan).

[11] The report of the staffs of the CFTC and SEC on the May 6, 2010 Flash Crash is available at https://www.sec.gov/news/studies/2010/marketevents-report.pdf.

The third category of issues on August 24 related to corporate stocks. Unlike for the market broadly, prices for a relatively small number of individual corporate stocks experienced flash crashes – extreme price declines followed by quick recoveries. These included six corporate stocks with very large capitalizations. In addition, 4.7% of the more than 4000 corporate stocks analyzed in the Research Note declined by 20% or more from the previous Friday's close price, while 19.2% of the more than 1400 ETPs analyzed in the Research Note declined by 20% or more.

The unusual volatility on August 24 warrants continued close evaluation to consider whether regulatory responses may be appropriate. As noted below, the SRO participants in the LULD Plan are considering potential modifications, and individual exchanges also are assessing their opening and reopening processes. And prior to August 24, the Commission broadly requested comment on ETPs, including the extent to which arbitrage mechanisms are effective in aligning ETP prices with their underlying indexes.[12]

SEC staff continues to examine a broad spectrum of issues related to trading on August 24. These include, among other things:

(1) factors that may have been associated with volatility in ETPs and other securities, including the nature of selling pressure, sources of liquidity provision, and, for ETPs, create and redemption activity;

(2) the effect of Regulation SHO short-sale restrictions;

(3) the opening process on primary listing exchanges, including the nature of trading prior to and immediately after the opening auction on the primary listing exchange;

(4) the reopening process following LULD pauses, including the nature of participants in the reopening auctions on primary listing exchanges and the rules and practices employed by exchanges in connection with reopenings;

(5) the operation of the LULD Plan, particularly as it applies in the period following the opening of regular trading hours and to reopenings following LULD pauses; and

(6) the operation of market-wide circuit breakers, particularly as they apply in the period following the opening of regular trading hours.

[12] Request for Comment on Exchange-Traded Products, Securities Exchange Act Release No. 75165, 80 FR 34729, 34740-34741 (June 17, 2015), *available at* https://www.gpo.gov/fdsys/pkg/FR-2015-06-17/pdf/2015-14890.pdf. The Comment period closed in August 2015, and the SEC has received 40 comment letters, which are available at https://www.sec.gov/comments/s7-11-15/s71115.shtml.

B. Regulatory Initiatives

The Commission advanced a series of key regulatory initiatives relating to equity market structure in 2015, and more are on the SEC's agenda for 2016.

1. Preventing Market Instability

One of the most serious concerns about highly electronic markets is the risk of instability and disruption. Sophisticated technology tools can enhance efficiency, but they also can facilitate the rapid onset of a trading disruption. These disruptions can arise when systems that drive algorithmic trading fail or malfunction, and also when high-speed trading leads to sudden gaps between liquidity demand and supply that can cause extreme price volatility. Addressing the risk of instability and disruption from these two sources has been a high priority of the SEC in recent years and will continue to be a focus in 2016.

Regulation Systems Compliance and Integrity (SCI)

The Commission adopted Regulation SCI in November 2014 to strengthen the technology infrastructure of the U.S. securities markets. Regulation SCI imposes requirements on key market participants intended to reduce the occurrence of systems issues, improve resiliency when systems problems do occur, and enhance the Commission's oversight and enforcement. Subject to a few exceptions, SCI entities were required to start complying with the requirements of Regulation SCI on November 3, 2015. The Technology Controls Program in the SEC's Office of Compliance Inspections and Examinations is now examining SCI entities for compliance with Regulation SCI.

A CyberWatch team has also been established that is responsible for triaging all system events reported to the SEC under Regulation SCI. This team currently monitors all the filings required by Regulation SCI that are submitted by SCI entities to the SEC. When a major SCI event is reported, they maintain constant communication with the SCI entity until the event is deemed resolved. Since Regulation SCI went live on November 3, 2015, CyberWatch has received three-hundred and twenty-six (326) filing submissions, including Non-De Minimis Event Notifications & Filings, Quarterly De Minimis and System Change Reports, and Annual Review Reports.

The Commission staff, in response to Chair White's directive, is preparing recommendations for the Commission's consideration as to whether an SCI-like framework should be developed for other key market participants, such as certain broker-dealers and transfer agents, whose operations can have a significant market impact if they are disrupted.[13]

[13] Chair White's November 19, 2014 statement is available at https://www.sec.gov/News/PublicStmt/Detail/PublicStmt/1370543489640.

Critical Market Infrastructure

Since 2013, SEC staff has been working with the SROs, including clearing agencies, on a range of market structure and infrastructure initiatives. One of these initiatives involved improving the resiliency of systems that constitute potential single points of failure, including the securities information processors for consolidated market data feeds (SIPs). In June 2014, the SIPs implemented enhancements to their disaster recovery sites and systems to establish a "hot/warm" backup process to provide for a ten-minute fail over from the primary to the backup sites. In addition, the equity exchanges have amended their clearly erroneous rules and the options exchanges have amended and harmonized their obvious error rules to provide greater clarity to market participants regarding trade breaks. The equity and options exchanges also have been enhancing their risk mitigation mechanisms. Most recently, the NYSE and NASDAQ have progressed on an initiative to serve as each other's backups if they are unable to fail over to their backup sites in time to run their respective closing auctions. These efforts compliment the new requirements of Regulation SCI, which are applicable to critical market infrastructure.

LULD Plan

Initially approved on a pilot basis in 2012,[14] the LULD Plan establishes a market-wide mechanism that is intended to moderate extraordinary price volatility in individual securities and reduce the incidence of erroneous trades. In particular, the LULD Plan requires trading centers to have policies and procedures reasonably designed to prevent trades from occurring outside specified price bands. If the national best offer (bid) reaches the lower (upper) price band, a limit state is initiated. If such national best bid or offer does not recover to inside the price bands within 15 seconds, a 5-minute trading pause is triggered to accommodate more fundamental price moves (as opposed to erroneous trades or momentary gaps in liquidity). The LULD mechanism is intended to reduce the negative impacts of sudden, unanticipated price movements in securities, thereby protecting investors and promoting a fair and orderly market. In particular, the LULD Plan is designed to address the type of extreme short-term price volatility that occurred during the 2010 Flash Crash.

The LULD Plan continues to operate on a pilot basis. Consistent with the SEC's data-driven approach to market structure issues, the SROs were required to provide an assessment of the LULD Plan. The SROs engaged a third-party consultant to provide an empirical assessment of the Plan's operation, which was submitted to the SEC in May 2015.[15] The consultant found that the LULD Plan generally had succeeded in preventing erroneous trades in large cap stocks during regular trading hours, and that the vast majority of limit states resolved themselves without triggering a trading pause. The consultant observed, however, that many LULD limit states and trading pauses occurred in small, low volume stocks, and that most were unnecessary

[14] *See* Securities Exchange Act Release No. 67091, 77 FR 33498 (June 6, 2012) (File No. 4-631), *available at* https://www.sec.gov/rules/sro/nms/2012/34-67091.pdf.

[15] *See* Angel, James J., "Limit Up – Limit Down: National Market System Plan Assessment To Address Extraordinary Market Volatility" (May 28, 2015), *available at* http://www.sec.gov/comments/4-631/4631-39.pdf.

and related more to difficulty in determining the opening reference price when the opening auction on the primary listing exchange did not produce a trade rather than to excess volatility.

The Commission recently published the SROs' proposal to extend the LULD Plan for another year until April 2017.[16] As noted by the SROs, extension of the pilot period will enable the SROs and the Commission to further evaluate the LULD Plan's operation. The SROs also have proposed to amend the LULD Plan to modify the identification of the first reference price of the day for those securities that do not have an opening auction trade. The first reference price for these securities would be the closing price of the security on the primary listing exchange on the previous trading day, or if no such closing price exists, the last sale on the primary listing exchange reported by the SIP. The Commission will consider whether to approve or disapprove the proposed amendment to the LULD Plan after the notice and comment process.

The SROs are continuing to evaluate additional issues regarding the operation of the LULD Plan, including those that may have been revealed by the events of August 24, 2015. On August 24, for example, trading centers resumed trading following a LULD pause but before new price bands were disseminated by the SIP. Many of these trades were executed at prices outside the new price bands. I understand that the SROs are working quickly to enhance their procedures to ensure they do not resume trading following a LULD pause without an effective price band in place, either by waiting for the message from the SIP or by temporarily calculating the new price bands internally. Given the potential for this problem to undermine the effectiveness of the LULD Plan when securities reopen following a trading pause, I have asked that each SRO enhance its procedures as soon as possible, but no later than April 1, 2016.[17]

I also understand that the SROs intend to propose a LULD Plan amendment to refine the operation of the LULD mechanism to eliminate the need for clearly erroneous execution rules, except in very limited objective circumstances. I expect that such an amendment will be filed for Commission consideration during the course of the next pilot period, should the Commission approve the proposed extension.

Finally, I understand that there are a number of other issues that the SROs are analyzing with a view towards possible further amendments to the LULD Plan, including: (i) a review of ETPs to determine whether adjustments should be made to the Plan to account for the particular trading characteristics of ETPs; (ii) the impact of double-wide price bands during the opening period, (iii) the advisability of coordinated reopening procedures; and (iv) potential enhancements to the categorization of securities into different tiers.

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[16] *See* 81 FR 10315 (Feb. 29, 2016). The comment period for the proposal ends on March 21, 2016.

[17] *See* Letter from Stephen Luparello, Director, Division of Trading and Markets, SEC, to Mr. Paul Roland, Chairman of the LULD Plan Operating Committee, dated February 10, 2016 (Re: Limit Up-Limit Down Plan to Address Extraordinary Market Volatility).

Shortening the Settlement Cycle

Currently, most securities transactions in equity and debt settle three days after the trade has been executed, which is referred to as "trade date plus three" (T+3). Last spring, the Industry Steering Committee (ISC),[18] established by the Depository Trust Clearing Corporation and co-chaired by Securities Industry and Financial Markets Association (SIFMA) and the Investment Company Institute (ICI), published a white paper that addresses certain procedural steps it believes are necessary to achieve the move to T+2.[19] The white paper also includes an implementation timeline that targets the transition to T+2 by the end of the third quarter of 2017.

Chair White and the Commissioners have expressed their support for the industry T+2 initiative,[20] and Chair White has asked the staff to develop a proposal to amend Rule 15c6-1. The staff is currently working on a proposal for the Commission's consideration, and is actively engaged in discussions with the ISC regarding industry planning and preparation for the prospective migration to T+2.

Transfer Agent Regulation

On December 22, 2015, the Commission issued an advanced notice of proposed rulemaking concerning a range of potential new requirements for transfer agents.[21] This marked the first significant action by the Commission in this area in over 40 years.[22] The staff will consider comments received as it develops further recommendations to the Commission for transfer agent reform.

2. Addressing High Frequency Trading

As algorithmic trading has increasingly dominated equity market volume, concerns have been raised about the speed and fairness of the equity markets. Algorithmic trading encompasses the high frequency trading strategies employed by proprietary trading firms, as well as much of the

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[18] The ISC oversees the Industry Working Group and Sub-Working Groups. All these groups are responsible for assessing the scope, requirements, and changes needed to facilitate the implementation of T+2.

[19] PricewaterhouseCoopers LLP, *Shortening the Settlement Cycle: The Move to T+2* (2015), *available at* http://www.ust2.com/pdfs/ssc.pdf.

[20] Letter from the Hon. Mary Jo White, Chair, U.S. Securities and Exchange Commission to the ICI and SIFMA (September 16, 2015), *available at*: http://src.bna.com/i7; Statement Regarding Proposals to Shorten the Trade Settlement Cycle, Commissioner Michael S. Piwowar and Commissioner Kara M. Stein (June 29, 2015), *available at* https://www.sec.gov/news/statement/statement-on-proposals-to-shorten-the-trade-settlement-cycle.html.

[21] *See Transfer Agent Regulations, Securities Exchange Act* Release No. 34-76743 (Dec. 22, 2015), *available at* http://www.sec.gov/rules/proposed/2015/34-76474.pdf.

[22] *See* Chair Mary Jo White, U.S. Securities and Exchange Commission, *Beyond Disclosure at the SEC in 2016* (Feb. 19, 2016), *available at* http://www.sec.gov/news/speech/white-speech-beyond-disclosure-at-the-sec-in-2016-021916.html; *see also* Commissioners Michael Piwowar and Kara Stein Statement of Support for the Need to Modernize the Commission's Transfer Agent Rules (June 11, 2015), *available at* http://www.sec.gov/news/statement/statement-of-support-modernize-sec-transfer-agent-rules.html.

trading by brokers acting on behalf of institutional investors. Algorithmic traders use a variety of low-latency tools. These include co-located services in the data facilities of trading venues and direct data feeds from these venues rather than consolidated data feeds, which are on average less than 1 millisecond slower than the direct data feeds due to the time needed for consolidation of data at the SIPs. While rolling back the technology clock is neither feasible nor appropriate, the SEC must assess the extent to which specific elements of an algorithmic trading environment may not optimally serve the interests of investors, as well the effectiveness of its regulatory oversight of high-speed and high-volume trading.

Additional Timestamps for Consolidated Data Feeds and Data Feed Usage

In response to Chair White's request to enhance the ability of market participants to monitor market data latencies, the SROs added additional timestamps to the consolidated data feeds in 2015 that reflect, for each order or execution processed by an exchange, the event processing timestamp included on the exchanges' direct data feeds. The exchanges also enhanced their procedures for clock synchronization. With a common event time reflected in both the consolidated and direct data feeds, market participants can now more readily assess the absolute and relative latencies of each, and determine which data feed best meets their trading or other business needs. In 2014, the exchanges, again in response to a request from Chair White, disclosed in their rules how they use the consolidated and direct market data feeds in their operations, thereby enhancing the opportunity for public understanding of today's equity markets.

Membership Requirements for Dealers Trading in Off-Exchange Venues

In March 2015, the SEC proposed amendments to Exchange Act Rule 15b9-1 that would require broker-dealers engaging in proprietary trading at off-exchange venues to become members of a national securities association.[23] SEC staff is reviewing comments on the proposal and is working to prepare a recommendation for the Commission to consider in 2016.

Enhanced SEC Recordkeeping Requirements for Trading Algorithms

SEC staff is developing a rulemaking recommendation for the Commission to consider that would strengthen recordkeeping requirements for algorithmic trading. Such requirements may encompass key elements of the algorithm itself, as well as a record of the orders generated by the algorithm. Such records would provide greater transparency for regulators into algorithmic trading.

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[23] Exemption for Certain Exchange Members, Securities Exchange Act Release No. 74581, 80 FR 18036 (April 2, 2015), *available at* https://www.gpo.gov/fdsys/pkg/FR-2015-04-02/pdf/2015-07293.pdf. The Commission has received twenty-one comment letters on the proposal, available at https://www.sec.gov/comments/s7-05-15/s70515.shtml.

Status of Unregistered Broker-Dealers

SEC staff is developing a recommendation for the Commission to consider in 2016 that would clarify the status of active proprietary traders that are not registered as broker-dealers and subject certain of them to the SEC and SRO regulatory regime for broker-dealers.

Anti-Disruptive Trading Rule

SEC staff is developing a recommendation for the Commission to consider that would address the use of aggressive, destabilizing trading strategies in conditions when they could most seriously exacerbate price volatility. Such a rule will need to be carefully tailored to apply to active proprietary traders in short time periods when liquidity is most vulnerable and the risk of price disruption caused by aggressive short-term trading strategies is highest.

EMSAC Discussions

EMSAC has formed a Market Quality subcommittee that will consider the impact of technology on the efficiency of the markets and systemic risks. Among other things, the subcommittee will consider market maker obligations and high frequency trading strategies that may exacerbate volatility. Any advice or recommendations of the subcommittee (and other subcommittees mentioned below) would be presented to the full advisory committee for its consideration.

3. Consolidated Audit Trail

In July 2012, the SEC adopted Rule 613 under Regulation NMS requiring the SROs to submit an NMS plan to create, implement, and maintain a consolidated audit trail (CAT). The CAT would capture customer and order event information for orders in NMS securities, across all markets, from the time of order inception through routing, cancellation, modification, or execution. CAT would represent a significant step forward in regulatory capabilities for oversight of the equity markets. In 2015, the SEC and SROs continued to make substantial progress toward a CAT.

First, the SROs filed amendments to the CAT plan in 2015 that contained additional information than the original plan necessary to the consideration of an operational plan. On February 27, 2015, the SRO's filed an Amended and Restated CAT NMS Plan.[24] On December 24, 2015, and February 9, 2016, the SROs filed an amendment to the Amended and Restated CAT NMS Plan.[25]

Second, the SEC approved an amendment to the CAT plan processor selection plan in June 2015 allowing the SROs to move forward with selecting the plan processor, which would build and operate the CAT. The CAT plan processor selection plan, which is separate and distinct from the

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[24] *See* Letter from the SROs, to Brent J. Fields, Secretary, Commission, dated February 27, 2015.

[25] *See* Letters from the SROs to Brent J. Fields, Secretary, Commission, dated December 23, 2015, and February 8, 2016.

CAT plan, governs the SROs' governance and selection of the CAT processor. The SEC also approved an amendment providing for recusal of plan participants in circumstances that might present conflicts of interest. In accordance with these amendments, the SROs narrowed the bids for CAT plan processor from six bidders to a shortlist of three bidders in November 2015.

Third, in anticipation of the SROs' completion of the CAT plan, we appointed a CAT project manager in November 2015. This person will be the technological point person for the development and usage of the CAT at the SEC, as well as the SEC's liaison with the SROs and the CAT plan processor. The CAT manager will maintain an open line of communication with the SROs and market participants.

Fourth, on March 1, 2016, the Commission approved exemption requests submitted by the SROs to provide the SROs the flexibility to include, in the CAT plan for notice and comment, alternative approaches to those described in Rule 613.[26]

Fifth, SEC staff is reviewing the Amended and Restated CAT NMS Plan to provide a recommendation to the Commission regarding publication of the plan for notice and comment. Although I cannot provide exact timing, I hope the staff will be in a position to submit a recommendation to the Commission soon to publish the CAT plan for public notice and comment.

If the Commission approves publication of the plan, there would likely be a sixty day comment period during which interested parties may submit comments to the Commission on the plan as noticed. SEC staff will consider comments received and evaluate what recommendations to make to the Commission, including potential modifications to the plan. Upon Commission approval of a CAT plan, Rule 613 provides that a plan processor shall be selected within two months of the effective date of the plan. SROs begin reporting data within one year of effectiveness; SRO members, except those that qualify as small broker-dealers, begin reporting data within two years of effectiveness; and SRO members that qualify as small broker-dealers begin reporting with three years of effectiveness.

4. Enhancing Market Transparency and Examining Trading Venue Regulation

As noted earlier, equity trading volume now is divided among 12 exchanges, more than 40 ATSs, and more than 200 non-ATS broker-dealers. The competition for order flow among these venues benefits investors by encouraging services that meet particular trading needs and by keeping trading fees low. As noted above in connection with the NYSE suspension of trading on July 8, multiple trading venues also can help avoid disruptions if one venue, even a major exchange, experiences a systems problem. Fragmented markets, however, also can raise questions regarding the rules that govern their operations and intermarket trading, including the

[26] *See* Order Granting Exemptions from Certain Provisions of Rule 613 Pursuant to Section 36(a)(1) of the Securities Exchange Act of 1934, Securities Exchange Act Release No. 34-77265 (March 1, 2016).

extent to which their operations are transparent to investors and whether the rules establish a fair and level playing field for competition.

Proposal to Enhance ATS Operational Transparency

In November 2015,[27] the SEC proposed to amend Regulation ATS to require ATSs that facilitate transactions in NMS stocks to make public disclosures on Form ATS-N about: (1) the activities of the broker-dealer that operates the ATS, and its affiliates, that relate to the ATS; and (2) the manner in which the ATS operates, including disclosures about types of subscribers, order types, execution procedures, and use of market data. These proposed rules are designed to provide greater transparency around the operations of ATSs so market participants can better evaluate ATSs as potential trading venues and make more informed routing decisions.

The Commission also proposed rules to provide a process for the Commission to determine whether an ATS qualifies for the exemption under which it operates and declare an NMS Stock ATS's initial Form ATS-N either effective or, after notice and opportunity for hearing, ineffective. The proposal includes a process for an ATS to file, and the Commission to review, amendments to Form ATS-N. The Commission also proposed rules to provide a process for the Commission to suspend, limit, or revoke the exemption after providing notice and opportunity for hearing. Finally, the Commission proposed that all ATSs' safeguards and procedures to protect subscribers' confidential trading information be written. These proposed rules are designed to facilitate the Commission's oversight of ATSs and thus, better protect investors.

The comment period on the ATS proposal closed on February 26, 2016. SEC staff is reviewing comments on the proposal and preparing a recommendation for the Commission to consider in 2016.

SEC Staff Papers and EMSAC Discussions regarding Rule 611 of Regulation NMS and Trading Venue Regulation

In April 2015, SEC staff prepared a briefing paper on Rule 611 of Regulation NMS, which restricts the execution of trades at prices that are inferior to quoted prices.[28] The paper first notes Rule 611's place in the U.S. regulatory regime for equity market structure and then summarizes the Rule's requirements and the SEC's objectives for the Rule when adopted. It then addresses changes in equity market structure that have occurred since Rule 611 was adopted in 2005, supported by a series of data tables. The tables provide data on changes in the market shares of trading venues, visible and dark fragmentation, trading volume, average trade size, and trade-through rates.

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[27] Regulation of NMS Stock Alternative Trading Systems, Securities Exchange Act Release No. 76474, 80 FR 80998 (December 28, 2015), *available at* https://www.gpo.gov/fdsys/pkg/FR-2015-12-28/pdf/2015-29890.pdf. The comment period closed on February 26, 2016, and comments are available at http://www.sec.gov/comments/s7-23-15/s72315.shtml.

[28] The paper is available at https://www.sec.gov/spotlight/emsac/memo-rule-611-regulation-nms.pdf.

EMSAC considered issues raised by the Rule 611 paper at a meeting in May 2015. It also has formed a Regulation NMS Subcommittee that will consider, among other things, the impact of Regulation NMS, including Rule 611, and whether it should be modified to reflect changes in trading technology and practices, and competition.

In October 2015, SEC staff prepared a briefing paper on the current regulatory model for trading venues and for market data dissemination.[29] It contrasted the regulatory model applicable to national securities exchanges, which are SROs, with that applicable to ATSs, which are registered as broker-dealers. The paper also was intended to facilitate a discussion of the SROs' role in the collection, processing, and dissemination of market data and the treatment of associated fees.

EMSAC considered issues raised in the trading venue papers at a meeting in October 2015. It also created a Trading Venues Regulation subcommittee to consider the current regulatory model for trading venues and whether it is optimally serving all market participants and the market as a whole.

5. Mitigating Broker Conflicts

Another area of focus in equity market structure is broker conflicts and how they are exacerbated or mitigated by the availability of many different trading venues. These venues offer a plethora of order types and other trading services, as well as various fees and payments related to these services. Most investors rely on their brokers to navigate market complexities of fragmented markets on their behalf, but monitoring execution quality can be difficult for even sophisticated investors.

Institutional Order Routing Transparency

SEC staff is developing a recommendation for the Commission to consider in 2016 that would expand investors' understanding of their brokers' routing decisions. Among other things, the staff's recommendation would enhance the information provided to institutional customers through standardized order routing disclosures. Requiring standardized disclosures, in combination with the recently proposed enhanced ATS operational transparency rulemaking, would be intended to provide sufficient baseline information to institutional investors to bolster their ability to: (1) assess the potential for harmful information leakage concerning their orders; (2) assess the conflicts of interest their broker-dealers may face in handling their orders; (3) assess the performance of a broker-dealer in handling their orders and achieving best execution; and (4) compare the services of their routing broker-dealers.

Exchange Order Type Transparency

As another means of increasing transparency in the markets, Chair White asked the exchanges in 2014 to conduct a comprehensive review of their order types and how they operate in practice.

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[29] The paper is available at http://www.sec.gov/spotlight/emsac/memo-regulatory-model-for-trading-venues.pdf.

The exchanges also were asked to consider appropriate rule changes to help clarify the nature of their order types and how they interact with each other (including a clear description of all material aspects of the operation of their order types). As a result, all of the exchanges reviewed their order types and related rules, and submitted proposed rule changes that provide substantial additional detail on their operation.

SEC Staff Papers and EMSAC Discussions regarding Maker-Taker Fee Structure and Customer Issues

In October 2015, SEC staff prepared a briefing paper on the maker-taker fee structure offered by many exchanges.[30] The purpose of the paper was to facilitate an objective assessment of maker-taker fees in the U.S. equity markets by outlining the development of the maker-taker fee model, summarizing the current public debate about its impact on equity market structure, and presenting both the asserted advantages and disadvantages of maker-taker fee structures. EMSAC also discussed maker-taker fee issues at multiple meetings in 2015, and its Regulation NMS subcommittee will consider approaches to a potential access fee pilot.

In January 2016, SEC staff prepared a briefing paper that was intended to facilitate consideration of certain issues affecting customers – particularly retail customers – in the current equity market structure, namely: (1) the risks of using certain order types; (2) the potential conflicts presented by payment-for-order-flow arrangements; and (3) the development of more meaningful execution quality reports.[31] EMSAC discussed these customer issues at its February 2016 meeting and also has created a Customer Issues subcommittee to consider initiatives to protect investor interests and promote investor confidence.

6. Building Quality Markets for Smaller Companies

Smaller public companies face market structure challenges that are not the same as those of larger companies. These include the need for a sufficiently liquid market that provides their investors with a reasonably efficient means to establish and liquidate positions. A single market structure may not fit all companies, and the SEC has sought to focus concretely on how to enhance the equity market structure for smaller companies.

Tick Size Pilot

One initiative designed to address concerns about improving liquidity in the secondary market for smaller companies is the development of a pilot program that would allow smaller companies to trade at wider tick sizes. In June 2014, the SEC directed the equity exchanges and FINRA to act jointly in developing and filing a national market system plan to implement a tick pilot program. The Commission noted particularly that a pilot program could facilitate studies of the

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[30] The paper is available at https://www.sec.gov/spotlight/emsac/memo-maker-taker-fees-on-equities-exchanges.pdf.

[31] The paper is available at http://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac-012616.pdf.

effect of tick size on liquidity, execution quality for investors, volatility, market maker profitability, competition, transparency, and institutional ownership in the stocks of small-capitalization companies.

In May 2015, the Commission approved a plan filed by the equity exchanges and FINRA (Participants) to implement a tick size pilot program (Tick Size Pilot).[32] In November 2015, the Commission issued an exemption to the Participants from implementing the Plan until October 3, 2016.[33]

The Tick Size Pilot will have a two-year duration (Pilot Period), and will include exchange-listed common stocks that have the following characteristics: (1) a market capitalization of less than $3 billion; (2) a closing price of at least $2 per share on the last day of the measurement period (and a closing price of not less than $1.50 per share during the measurement period); (3) a consolidated average daily volume of one million shares or less; and (4) a volume-weighted average price of at least $2 per share (Pilot Securities).

Pursuant to the Tick Size Pilot, Participants will collect data reflecting a variety of market quality metrics with respect to the Pilot Securities and transmit such data to the Commission. The collected data will be publicly available in an aggregated form. In addition, the Participants are required to conduct, and provide the Commission with, a publicly-available impact assessment. The Participants are scheduled to begin collecting Tick Size Pilot data in April 2016, which is six months prior to the start of the Pilot Period.

The Participants have submitted to the Commission proposed rule changes to implement the quoting and trading requirements and the data collection requirements.[34] The Commission has approved the proposed rules to implement the data collection requirements that have been submitted, as well as one of the proposals to implement the quoting and trading proposals that have been submitted.[35]

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[32] Securities Exchange Act Release No. 74892, 80 FR 27513 (May 13, 2015), *available at* http://www.sec.gov/rules/sro/nms/2015/34-74892.pdf .

[33] Securities Exchange Act Release No. 76382, 80 FR 70284 (November 13, 2015), *available at* http://www.sec.gov/rules/exorders/2015/34-76382.pdf. The Tick Size Pilot was scheduled to begin in May 2016. However, in order to give the SROs and their members sufficient time to implement the Tick Size Pilot, the Commission issued the exemption to the Participants.

[34] *See*, *e.g.*, Securities Exchange Act Release No. 76552 (December 3, 2015) (File No. SR-BATS-2015-108), *available at* http://www.sec.gov/rules/sro/bats/2015/34-76552.pdf; Securities Exchange Act Release No. 76229 (October 22, 2015) (File No. SR-NYSE-2015-46), *available at* http://www.sec.gov/rules/sro/nyse/2015/34-76229.pdf.

[35] Securities Exchange Act Release No. 77105 (February 10, 2016)(order approving BATS' rules to implement the data collection requirements of the Tick Size Pilot), *available at* http://www.sec.gov/rules/sro/bats/2016/34-77105.pdf; Securities Exchange Act Release No. 77164 (February 17, 2016) (order approving FINIRA's rules to implement the data collection requirements of the Tick Size Pilot), *available at* http://www.sec.gov/rules/sro/finra/2016/34-77164.pdf; Securities Exchange Act Release No. 77218 (February 23, 2016) (order approving FINRA's rules to implement the quoting and trading requirements of the Tick Size Pilot), *available at* http://www.sec.gov/rules/sro/finra/2016/34-77218.pdf.

Venture Exchanges

On March 4, 2015, the SEC's Advisory Committee on Small and Emerging Companies held a meeting at which it considered venture exchanges and other means to increase secondary market liquidity for investors in smaller companies. Previously in 2013, this Advisory Committee had recommended the development of a separate U.S. equity market that would facilitate trading in the securities of small and emerging companies.

On March 10, 2015, the Commission submitted testimony to this Subcommittee for its hearing on venture exchanges and small capitalization companies.[36] The Commission stated that it was considering innovative approaches that appropriately balance the needs of smaller companies for efficient secondary markets and the interests of investors in smaller companies. It noted that venture exchanges potentially could achieve such a balance by providing investors a transparent and well-regulated environment for trading the stocks of smaller companies that offers both enhanced liquidity and strong investor protections. The Commission observed that it had previously approved a proposal for a venture exchange, but the exchange had never been launched. It emphasized, however, that, as it did with the BX Venture Market, it would carefully consider any efforts of exchanges that were particularly designed to meet the needs of smaller companies and their investors.

The Commission continues to be receptive to efforts that would appropriately balance the needs of smaller companies and the interests of their investors.

III. Conclusion

Thank you again for inviting me to discuss the SEC's efforts to strengthen the U.S. equity market structure. As is evident from the many initiatives noted above, the SEC's program for optimizing equity market structure is actively moving forward. I look forward to answering your questions.

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[36] A copy of that testimony is available at http://www.sec.gov/news/testimony/testimony-venture-exchanges.html.